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Foreword

It gives me great pleasure to introduce the 16th edition of the *South African Health Review* (SAHR). This year's edition provides information on selected issues that are relevant to the six building blocks of health systems strengthening, the Negotiated Service Delivery Agreement and primary health care re-engineering.

A range of experts provide commentary on topics such as social determinants of health, non-communicable diseases, climate change and occupational health. The Review also contains a section on core health issues where recent developments in health information, medicines selection and pricing and health legislation and policy are discussed.

The Review is aimed at policy makers, planners, health managers, researchers, students and local and international health and development organisations. Feedback from delegates attending Health Systems Trust's 20 year anniversary celebration reaffirmed the value of the Review both nationally and internationally and we are grateful for the various ways in which the public health community support the production of the Review. In recognition of the need to build the public health capacity and expertise within the health arena and as part of HST's 20 year celebrations, we have initiated the Emerging Public Health Practitioner Award in recognition of the best article submitted by a young and emerging public health professional for inclusion in the *South African Health Review* (SAHR). Two entries are included in this edition.

A strong team within the HST has worked throughout the year to bring the Review to completion with support from a cadre of highly regarded peer reviewers and authors. On behalf of the Board I wish to extend our thanks and appreciation to all HST staff that have been involved in the production of the Review and to the authors, peer reviewers and the SAHR Editorial Advisory Committee who provided oversight and direction to the Editorial Team.

The collective input of internal and external peer reviewers and the willingness of authors to accommodate collegial feedback and editorial comment has strengthened the Review and ensured that a diverse range of thoughts and views are represented in the publication.

We also extend our gratitude to the National Department of Health for supporting the production of this Review.

We trust that you will find this Review a worthy contribution to building health systems in South Africa.



Welile Shasha

Chairperson of the Board of Trustees



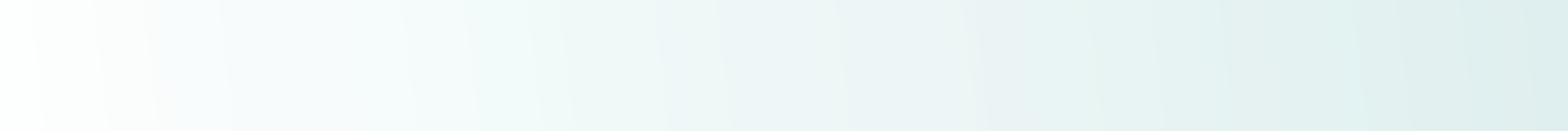


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Acknowledgements

Editors

Ashnie Padarath and René English

Editorial Advisory Committee

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Contributing Authors

We acknowledge with gratitude the individual authors' commitments to contributing to the Review and for responding to editing demands, often at short notice, despite their other competing responsibilities.

Peer Reviewers

We express our sincere thanks to all the peer reviewers who, in the spirit of collegiality, made many insightful comments and thus enhanced the quality of the chapters in this Review. In particular we are grateful to the following people: Duane Blaauw, Mark Blecher, Candy Day, David Rees, Tanya Doherty, Adila Hassim, Jeanette Hunter, Stephen Knight, Leslie London, Refilwe Nancy Phaswana-Mafuya, Di McIntyre, Heather McLeod, Julia Moorman, Saloshni Naidoo, Shan Naidoo, Antoinette Ntuli, Dingie Janse van Rensburg, Friedrich Soltau, Fatima Suleman, Myra Taylor and Gustaaf Wolvaardt.

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We are grateful to the National Department of Health for providing access to various data sets used in this Review.

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Compiling a publication like the *South African Health Review* is a huge undertaking that requires collective input and support from a wide range of people. We owe a debt of gratitude to Barbara English and Susan van Tonder of Wordsmiths English Consultancy for their meticulous editing. We acknowledge the contributions of Stephanie Ortynsky, Catherine Pagett and Michael Cadegan for their work on the referencing. Thanks are due to Lynda Campbell of the Press Gang for maintaining the high standard of layout and design that the Review has become associated with. We thank staff members of Health Systems Trust for providing various types of assistance and support: Rakshika Bhana, Candy Day, Jabulile Dube, Julia Elliot, Delene King, Jeanette Hunter, Hlengiwe Ngcobo, Catherine Pagett, Tamlyn Seunanden and Nompumelelelo Xulu. We are also grateful to Peter Barron for his continuous support and assistance. The role of the Board of Trustees, particularly the input of the Health Systems Research sub-committee, is gratefully acknowledged.

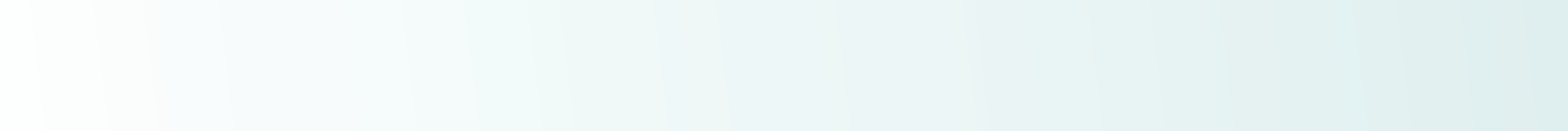
As HST celebrates its 20th anniversary this year, we pay tribute to all previous editors of the SAHR and the pioneers who were instrumental in conceptualising and developing it. We thank them for having the vision and passion to create a product that has become a flagship publication and is consistently associated with excellence and quality.

Funders

This publication was supported by a grant from the South African National Department of Health.

Cover

The cover photo entitled "*Usuku Empilweni*" is an original painting by Siyabonga Sikosana, which depicts a day in the life of a South African rural community.



Editorial

Eighteen years into democracy and three years after the national 2009 general elections that ushered in new national health leaders and a range of new legislation, South Africa finds itself in the throes of implementing numerous health sector reform policies aimed at transforming the public and private health landscapes and overcoming ever increasing inequities between its society's wealthiest and poorest. The current focus is on implementing the components of key strategies such as the Negotiated Service Delivery Agreement (NSDA) which presents four strategic outputs to be achieved by the South African government. Output four, which is to strengthen the effectiveness of health systems, primarily through the introduction of primary health care re-engineering and the 14-year-long planned implementation of National Health Insurance (NHI) as a financing mechanism for the health system, has received significant attention in the year 2012.

However, a range of programmatic activities designed to move towards attaining output one (increasing life expectancy), output two (decreasing maternal and child mortality) and output three (combating HIV and AIDS and decreasing the burden of disease from TB) have been substantially prioritised, escalated and supported by the release of a raft of plans and national strategies intended to be implemented on a wide scale. To this end, 11 NHI pilot sites have been identified that will serve as the basis for testing the process of overhauling the health system, and the generation of models, good practices and lessons to inform further implementation and future scale up to more districts. Much of what has spurred South Africa's commitment to re-engineering the health system has also been driven by South Africa's overwhelming quadruple burden of disease fuelled by a range of risk factors – such as unsafe sex and sexually transmitted disease; interpersonal violence; alcohol, tobacco smoking and obesity; maternal and childhood malnutrition; and decreased physical activity amongst other factors. The high prevalence of these and other risk factors, including rising non-communicable disease rates, has turned policymakers' attention to addressing the social determinants of disease.

Twenty years after the inception of the Health Systems Trust, this 16th edition of the *South African Health Review* (SAHR) broadly focuses on some of the key building blocks of the health system: financing, governance and leadership, medical products and service delivery. Throughout the Review, authors make reference to issues that relate to human resources and information. The Review also focuses on the social determinants of health and South Africa's quest to start addressing these. While the SAHR aims to provide a broad country perspective, this edition heralds the start of a move towards supplementing evidence of change with examples of actual change and activities on the ground through the inclusion of case studies, vignettes and profiles of interesting innovations. Below, we also introduce the newly launched Emerging Public Health Practitioner Award which provides a voice to young and upcoming under-35-year-old public health professionals. We hope that in years to come this award will inspire these practitioners to add to

new and ongoing public health debates and to present innovative solutions to problems that plague our health system.

This year's SAHR kicks off with two chapters that deal with legislation and financing respectively. Chapter 1 on *Health Policy and Legislation* focuses on the period 2011/12. Andy Gray and colleagues report that no new health-related legislation was passed during this period but that two health-related Bills are before Parliament namely the National Health Amendment Bill (Bill 2 of 2011) and the Mental Health Care Amendment Bill (Bill 39 of 2012). Secondary and tertiary legislation in the form of Regulations were published for comment or finalised by the Minister of Health, and board notices were issued by statutory health councils. In this chapter attention is paid to legislative barriers with regard to telemedicine and an intellectual property policy released for comment by the Department of Trade and Industry. The authors conclude that despite progress, some critical elements in the field of health policy and legislation remain unresolved.

Malebona Precious Matsoso and Robert Fryatt summarise progress against a plan of action and present future plans for introducing the NHI policy since the launch of the Green Paper in August 2011. In this chapter, entitled *National Health Insurance: The first 18 months* (Chapter 2), a discussion on the NHI Green Paper and legislative process is presented. This discussion covers management reforms and designation of hospitals; hospital reimbursement reforms; and public health facility audit, quality improvement and certification processes. Progress in implementing the primary health care re-engineering policy is outlined and work to enable provinces to plan, manage, modernise, rationalise and transform infrastructure for public sector hospital infrastructure and equipment is presented. The authors also report on progress in terms of human resources for health, information management and systems support, and provide an overview of progress towards strengthening district health authorities, financing, establishment of the NHI Fund and considerations for accreditation and contracting private providers. A list of five key challenges accompanied by their risks and proposed mitigation is also presented under the headings of 'consultation and communication', 'harnessing cost-effective health technology', 'making change happen', 'building up knowledge on what works' and 'retaining the focus on equity'. A number of case studies are presented and the authors conclude that universal coverage is no longer merely a dream for South Africa.

Chapter 3 heralds a shift in focus from legislation and financing to service delivery-related matters and focuses on *HIV Treatment in South Africa: The challenges of an increasingly successful antiretroviral programme*. South Africa has the largest number of people with HIV in the world and now has the largest and possibly the most ambitious antiretroviral (ART) programme globally. The author, Francois Venter, examines political, policy, programmatic and other issues entailed by the initiation and expansion of the South African ART programme and frames most of his discussion within three politically related eras spanning the period 2004

to 2012. The role of non-profit organisations and civil society is also discussed, with mention of the role of activism, litigation and negotiations at all levels in the ultimate development of a successful widely implemented and supported programme. Francois Venter highlights successes – such as statistics showing that 2 million people were accessing ART at the end of 2012; a shift to improved treatment regimens; good viral suppression; retention in care and clinical outcomes; an increase in life expectancy attributed to increased access to ART; and a reduction in the national mother-to-child transmission of HIV rate from 30% to below 3%. Despite the undoubted gains, mostly made during the post-2008 era when a new political dispensation and subsequent reorientation and scale up of the programme occurred, the South African government still faces a number of challenges. The cost and scale of the programme, evolving HIV treatment guidelines, the failure of past and current prevention programmes, the need to continuously integrate HIV with TB and antenatal services, and the implications of adopting a ‘treatment as prevention’ programme in South Africa are also discussed. Good governance is required and the author highlights that provincially, with the exception of one province, poor financial and programme planning have proven to be major obstacles to seamless implementation and scale up. The chapter emphasises in its conclusion the need for strong medicines supply and service delivery systems which, if weak, can threaten the ongoing expansion of the treatment programme. Government is challenged to consider thinking creatively about how to best manage HIV as a chronic disease through developing systems that will facilitate ongoing disease monitoring and reducing the number of health facility visits.

Chapter 4 explores output 2 of the NSDA and is entitled *Maternal, Newborn and Child Health*. Lesley Bamford reports that, although South Africa continues to experience unacceptably high rates of maternal, newborn and child mortality, a decline in the under-five and maternal mortality ratio has been observed. The chapter provides an overview of global and national commitments and strategies aimed at improving the health of mothers, newborns and children, and discusses progress towards implementing priority interventions as outlined in the first National Maternal, Newborn, Child and Women’s Health and Nutrition (MNCWH&N) Strategic Plan. An overview of global mortality rates and trends, including the primary causes of mortality within the groups under review is provided and the author attributes mortality in children to undernutrition. Evidence shows that increased coverage of proven interventions should specifically be aimed at the poorest and most disadvantaged children to overcome the increasingly observed disparity in mortality between the wealthiest and most deprived quintiles. Thus four international commitments and strategic documents are discussed, including the global strategy for women’s and children’s health that sets out key areas where action is urgently required for financing, policy and service delivery improvements, to the global strategy for elimination of new HIV infections among children. This strategy aims to reduce the number of HIV-related maternal deaths and to reduce the number of new childhood HIV infections. Eight local commitments and interventions are also presented, which range from a number of related strategic documents to the Tshwane Declaration to promote exclusive breastfeeding. In an attempt to track progress in implementing key interventions and programmes, Bamford presents the package of priority maternal and child health interventions as outlined in the MNCWH&N Strategic Plan, highlighting the 56 essential interventions that – when implemented

in packages relevant to the local setting – are most likely to save lives. The chapter concludes with a caution that without the needs of the health system being addressed, which include increasing the availability of adequate numbers of well-trained healthcare workers at facility and community levels; strengthening monitoring and evaluation systems; addressing equity; increasing accountability; and ensuring that all the components of the MNCWH&N Strategic Plan are implemented, South Africa will not attain the goals it has set for itself.

Occupational health comes under the spotlight in Chapter 5, where Shahieda Adams and colleagues take an interesting look at two occupational populations for which the National Department of Health has legal responsibility, namely healthcare workers at risk of contracting tuberculosis, including multidrug-resistant TB, and former mineworkers with occupational lung disease due to exposure to hazardous dust. The Department’s responsibility towards the former group is as an employer, and for the latter group it bears legal responsibilities for examination and compensation. The authors express their concern at the rising incidence and prevalence of multi-drug-resistant and extremely drug-resistant TB in healthcare workers. Global and local policies, statutory provisions and local institutional frameworks for managing TB among healthcare workers are presented but it is stressed that no uniform national strategy that actively supports TB risk management and limited active enforcement of current regulations exists. They argue that greater emphasis on intensified case finding and isoniazid prophylaxis and improved infection control is required for healthcare workers. For former mineworkers, the authors specifically discuss the problem of the failure of statutory examination and compensation systems for occupational lung disease. They question what the appropriate health system response to the combined silica/silicosis and TB epidemics should be, given that in the case of mineworkers these conditions have their roots in the private mining sector yet become the problem of the public sector. In response a review of key legislation that touches on the management of lung diseases in mineworkers, access to benefit medical examinations by former mineworkers, and claims management are presented. The chapter concludes with a range of recommendations, a central one of which is instituting measures to hold the mining industry accountable for reducing the root causes of the epidemic (the risk of exposure to silica dust at source) and for legal, financial and managerial reforms of compensation systems.

A key component of the district health system is the community and in South Africa, as has been reflected in many chapters of this Review, civil society has played and continues to play a pivotal role in shaping health policy, particularly in the era of HIV and AIDS. Kerry Cullinan, in the chapter entitled *Citizen Reporting on District Health Services* (Chapter 6), describes an innovative pilot project conducted in half of the NHI pilot districts that is aimed at reporting on health conditions at the district level in order to improve service provision. The underlying premise is that where political structures fail in the area of service delivery, collective citizen action (‘social accountability’) by or on behalf of the poor will spur policymakers and service providers into action. Numerous national examples of media-driven social accountability through the use of citizen journalists are presented and a description of the initiative is provided. The author states that this form of reporting will create more opportunities for district-level grievances and successes to be profiled and to be given the attention they deserve.

Chapters 7 to 10 shift the reader's focus to social and environmental determinants of health, and cover injuries, violence and alcohol; non-communicable diseases; and climate change. *Mainstreaming the Social Determinants of Health in South Africa: Rhetoric or reality?* is the seventh chapter in this Review. Here Laetitia Rispel and Sara Nieuwoudt draw from a range of government policy documents and budget speeches, as well as key informant interviews, and present an analytical perspective on the social determinants of health in South Africa. The chapter gives an overview of key global developments, including the 2008 Commission on Social Determinants of Health report. The authors report that locally, the NSDA recognises the importance of addressing the social determinants of health with some determinants linked to explicit actions, whereas the linkages in other policies are less clear. Furthermore, details on specific areas and mechanisms for intersectoral collaboration are not described in any of these policy documents. Their discussion on local action, highlighting progress and challenges made with regard to addressing the social determinants of health, provides a detailed analysis of the extent to which the determinants are reflected in the 2012 national and provincial budget speeches with a specific focus on intersectoral governance structures and corresponding governance actions. The authors conclude that rhetoric on the social determinants of health in South Africa exists in policy and at national and provincial levels with structural mechanisms ranging from narrow bilateral departmental arrangements to integrated planning approaches. The lack of prioritisation of intersectoral initiatives, however, casts doubt on government's capacity and ability to make substantial and measurable progress in this regard. Key barriers to intersectoral action and to addressing the social determinants of health can be characterised as being related to legislative and policy design, governance and leadership, gaps between policy and implementation, lack of or insufficient resources and resourcing, and lack of monitoring and evaluation. The chapter concludes with a call to learn from local and international experiences in order to thrust South Africa beyond rhetoric and lists a set of proposed activities to this end. Finally, there is also a call for more research evidence on the social determinants of health, as well as for a more critical discourse and focus on overcoming inequities.

Joanne Corrigan and Richard Matzopoulos, in Chapter 8, on *Violence, Alcohol Misuse and Mental Health: Gaps in the health system's response*, continue the discussion for the need for better intersectoral collaboration and make the point that the leading causes of disease burden in South Africa are inextricably linked. The authors provide evidence to support this claim. In their discussion of the interrelationship between alcohol abuse, violence and mental ill health the association between the three are explored. They attribute gaps in the health services to a lack of governmental recognition and prioritisation of the multi-directional links between the 'triad' as presented above which have knock-on effects of poor data availability, policies and interventions that can address these problems in an integrated manner. Other gaps relate to under-resourcing of the health system, the under-detection and inadequate management of these conditions within healthcare settings, and decreased access that results from a range of logistic-, cultural- and knowledge-related barriers. Surveillance is identified as a key component in supporting the identification and management of these public health problems; in particular, the institutionalisation of an injury mortality surveillance system. The authors present a case for better intersectoral responses within the health sector and

between relevant sectors, given the nature and overlap of the risk factors for violence, alcohol abuse and mental disorders. They present an example of an integrative approach at a national level – the establishment of the Inter-Ministerial Committee on Combating Substance Abuse in 2010 – and propose the establishment of a similar committee that will provide a joint platform for the three public health priorities with oversight provided at the highest level; that is, the Cabinet.

Non-communicable diseases have increasingly become a topic of debate given their contributions to rising morbidity and mortality rates both globally and locally. Thandi Puoane and colleagues in their chapter on *Chronic Non-communicable Diseases in South Africa: Progress and challenges* (Chapter 9) describe the current status of chronic non-communicable diseases and the key drivers of these in South Africa, and provide a five-year overview of local policies and practices. In South Africa, non-communicable diseases account for 37% of all-cause mortality and 16% of disability-adjusted life years. South Africa has shown commitment to focusing on these diseases through convening a summit in 2011. A strategic plan for non-communicable diseases is also under development. The chapter focuses on the 'big four' non-communicable diseases – heart disease, cancer, type II diabetes and chronic obstructive pulmonary disease – with a focus on their risk factors as presented within a framework ranging from biological, behavioural (e.g., tobacco use, obesity, physical inactivity, alcohol misuse), and societal (e.g., employment, poverty, education, accommodation, socio-economic status and behavioural risk factors) to structural and environmental (e.g., food environment, marketing of unhealthy products and behaviours) determinants. A range of policy responses is discussed, examples of initiatives and programmes targeting chronic non-communicable disease in South Africa are presented. A list of population-wide interventions to promote healthy diet, physical activity, and a healthy environment that the South African government should consider is included. The authors conclude that a wide range of interventions should be targeted at the broad range of determinants (e.g. individual and societal) with a specific focus on the development of policy responses to address the structural environment.

Jonathan Myers and Hanna-Andrea Rother discuss the *Public Health Impact of and Response to Climate Change in South Africa* in Chapter 10. They reflect on recent global declarations in the field of climate change and health and present key concepts and definitions that serve to frame their discussion on the potential impact of climate change on health in the country. Attention is paid to South African public sector responses to climate change and health with a review of what is being done at a national and provincial level. The authors conclude with a discussion on the barriers and enablers to the implementation of climate change interventions and underline the need for enhanced knowledge and understanding of the potential impacts of climate change on health in South Africa, particularly on the existing burden of disease. This requires the modelling of local climatological data to understand the health-equity implications of these changes. It also requires use of and access to mortality and morbidity data at the lower levels so that 'climate scenarios' can be produced. Transversal and cross-sectoral collaborations are proposed as being key to successful policy development and implementation. Research, development and collaborative work between academic health institutions and the health system, which focuses on the link between climate change and its potential impact on South Africa's burden disease, are called for.

Governance and leadership is a key building block of the health system. Chapters 11 to 13 touch on the national research system in South Africa; a university perspective of health policy and systems research; and leadership and management at sub-district level.

Given the inclusion of research and development strengthening in the 2009 to 2014 South African 10 Point Plan, Flavia Senkubuge and Bongani Mayosi, in Chapter 11 on *The State of the National Health Research System in South Africa*, present an assessment of the performance of the national health research system as envisaged by the Health Research Policy of 2001. The authors state that evidence shows that large economic return on investments can be observed when medical research is invested in at country level, and that global commissions have shown that health research is not given its rightful place in improving health, equity and development in low- and middle-income countries. A key recommendation is given by the authors that the latter countries spend at least 2% of their health programme budgets on health research, with donors adding at least 5%. In this chapter a framework for assessing national health research systems is used to determine the state of the South African national health research system with a focus on stewardship, financing, creating and sustaining resources, and producing, synthesising and utilising research. It is noted that because of declining investigator-initiated original clinical research over the past few years, South Africa should revitalise clinical research. Seven challenges and recommendations for the revitalisation of the health system are presented. These are increasing the financial allocation to health research; increasing funding to increase the number of relevant human resources; investing in health research facilities and infrastructure; creating of a National Priority Health Research Fund to stimulate new and innovative research and address key health system priorities; developing a National Regulatory Framework; establishing a planning, coordination and translation of research findings body; and finally ensuring the institution of national mechanisms for monitoring and evaluation of research conducted in the country.

Chapter 12, *Health Policy and Systems Research: Needs, challenges and opportunities in South Africa – a university perspective*, provides a South African higher education perspective on the growth of the field of health policy and systems research in response to the increasing international recognition of the need to deliver cost-effective health interventions within a strengthened health system. Marsha Orgill and colleagues list the key milestones in the development of the field and provide basic definitions and seek to frame health policy and systems research within the broader terrain on health research in general. They present three health policy and systems research groups located within higher educational institutions and a capacity assessment of these. The authors also set out the findings of a Public Health Association of South Africa pre-conference health policy and systems research workshop and discuss the challenges facing future local development of this field, at individual, organisational and system levels. The authors argue that this form of research, which adopts a 'systems thinking' approach, has a multi-disciplinary base that encompasses both social science and more traditional health research perspectives. They also propose that more research with a systems focus rather than an intervention focus is required, with a need to understand what policies mean, how they will impact on and reshape health systems functioning and to continuously learn from implementation.

Of importance is the need for research to ask questions such as why implementation fails and what it is that guides implementation at service delivery levels. Interrogating the roles of power and politics, among other things, is also needed. They conclude with a call to establish a community of practice for sharing and engagement across projects and institutions.

An exploration of the complexities and challenges of managing a sub-district and framing a debate on the role of districts and sub-districts using systems thinking and management theory with regard to strategic policy direction setting and operational service implementation is presented in Chapter 13, entitled *Crises, Routines and Innovations: The complexities and possibilities of sub-district management*. Soraya Elloker and colleagues present a case study on an action-learning project in a South African sub-district with a specific focus on leadership and management. The authors focus on the intangible software of the health system such as relationships, communication practices, values and norms and its role in determining the behaviours of those working in the health system and the location of organisational practices and routines within this software dimension. Three innovations for galvanising actors at the sub-district level and for building capacity to improve routines and relationships are presented: developing pro-active management; developing local service-improvement priorities; and generating local knowledge, priorities and action. The authors conclude that numerous competing demands, actors, existing organisational cultures and legacies undermine progress towards decentralisation and innovation and highlight the influence that organisational software has in this sphere. Ultimately, managers are expected, and should be willing and able, to manage in 'calculated chaos', hence management and leadership development programmes should focus on developing the software elements as well as technical skills and capacities.

Medicines, vaccines and technology are key building blocks and hardware of health systems. There is, however, a tendency to neglect the importance of these elements and supporting processes when key health system success factors are under discussion – in particular those related to procurement and management of these elements. In Chapter 14, Bada Pharasi and Jacqui Miot seek to shed light on *Medicines Selection and Procurement in South Africa* with a focus on these components in the 1996 National Drug Policy. The authors focus on medicines selection in the private sector; in particular, medicine formularies and guidelines and selection of medicines under prescribed minimum benefits. Standard treatment guidelines, the essential medicines list and the role of the pharmacy and therapeutics committees in the public sector, are discussed. The shift towards medicines procurement centralisation with the establishment of the Central Procurement Agency in 2011 and the Department of Health taking over the management of medicines tenders from the National Treasury are discussed. The authors emphasise the importance of applying evidence-based medicine, pharmacoeconomics and budget impact analysis when selecting medicines and that a coherent approach is required – especially in preparation for NHI. They highlight, however, that more attention needs to be given to medicine supply chain management at lower levels in the health system, particularly at the district level. They call for a monitoring and evaluation plan to measure the impact of the National Drug Policy's implementation and for a national review of implementation thus far.

Health Systems Trust is committed to developing young health policy and system researchers who work within the broad field of public health. Creating a space to hear these voices and to provide a platform for the introduction of new ideas, research and perspectives is considered to be crucial for expanding the body of public and private health sector and system researchers. To this end, we proudly launch the Emerging Public Health Practitioner Voices series. In the second half of 2012, we introduced the Emerging Health Practitioner Award and called for young and emerging public health practitioners under the age of 35 to submit a well-written and comprehensive piece of work that (1) bears relevance to the local and international public health community and current policy environment, (2) has a degree of innovation and originality, (3) identifies good practices and hindrances to policy implementation and (4) is scientifically rigorous and intellectually clear. Through a process of anonymous peer review two articles submitted for consideration in 2012 were assessed as being worthy of inclusion in this year's SAHR. These are presented below.

Nadia Hussey, a medical student at the University of Cape Town, takes a closer look at the effects of language barriers on the access patients and communities have to quality health care. Her chapter, entitled *The Language Barrier: The overlooked challenge to equitable health care* (Chapter 15), provides an insightful glimpse into the challenges language barriers pose to work efficiency and holistic treatment. She presents a case study of Madwaleni Hospital in the Amathole district in the Eastern Cape and explores current language difficulties, methods of overcoming these barriers, and proposes future broad health system solutions touching on effective translation and interpretation models. She discusses the need for developing a culture of multilingualism, through adopting a bilingual worker model, and explores the 'explanatory model' approach. In this approach a patient's personal and cultural experience of illness is addressed in order to gain an understanding of the patient's personal and cultural experience of illness in an environment where language barriers preclude easy understanding of the patient's condition and perception of disease.

The author draws attention to the absence of language as a component in key health sector reform policies, despite it being mentioned in the Patients' Rights Charter and the National Health Act (Act 61 of 2003). She also asserts that health promotion, prevention and community involvement cannot succeed without engagement in a dialogue in the language of the patient. Finally, she calls for the application of a multifaceted solution to ensure provision of multilingual healthcare in a multilingual society.

Adeleke Oluwatoyin, in Chapter 16, writes on the *Barriers to Implementation of Tuberculosis Infection Control among South African Healthcare Workers*. This author, from the School of Public Health and Family Medicine at the University of Cape Town, provides an overview of health system factors that influence health worker performance in implementing tuberculosis infection control in primary care clinics at district level. This chapter, which complements Chapter 5's presentation of occupational health challenges facing the Department of Health, provides a closer look at the barriers and enablers to implementing tuberculosis infection control and discusses how lessons learned from the work presented in this chapter could influence health policy reform and inform managers about ways in which health-worker performance could be improved in high-risk settings. The work, based on the author's

own research, lists the enablers of tuberculosis infection control implementation among health workers to be availability of resources in the form of infrastructure, human resources and consumables, leadership, supervision, collective practice and screening for TB in healthcare workers. Key barriers were identified as being non-proactive use of respirators, healthcare worker perceptions of tuberculosis concentration in certain sections of clinics, non-responsive compensation policies, patient non-compliance, issues pertaining to prioritising prevention activities, and training deficits. From a policy perspective, bureaucratic compensation delays were highlighted as a major barrier to building trust in the health system. Mechanisms to address these barriers were identified as key future areas for research.

Finally in Chapter 17, Candy Day and Andy Gray present key *Health and Related Indicators*. A comprehensive range of routine and non-routine data are presented and for each section that authors discuss recent developments. The content includes demographic, socio-economic, health services and health financing indicators. Provincial maps, colour graphs and indicator definitions are also included.

As South Africa focuses on the implementation of the many recently developed policies aimed at reforming the healthcare system and strives to move as close as possible to achieving the Millennium Development Goals (MDGs), it is perhaps also prudent to think about how the health sector will position itself in the post-2015 development agenda. Key issues are likely to be how to respond to the unfinished MDG health agenda, as many countries – including South Africa – will not meet the MDG goals for 2015. The changing agenda for global health that has been identified by the United Nations involves moving away from addressing disease-specific issues to a more equity- and social-justice-oriented approach that is rooted in the concept of understanding health as an indivisible human right that cannot be realised without tackling the economic, social and environmental determinants of health. In this regard, issues such as universal health coverage, addressing non-communicable diseases and ensuring access to services from an equity perspective will feature more prominently on the global health agenda. Attention is also likely to be focused on health in the context of sustainable development, where health is understood as both a potential beneficiary of and a contributor to sustainable development. Improvements in the physical environment and the implementation of mitigation and adaptation strategies to reduce the effects of climate change, for example, can result in reduced burdens of infectious diseases. In the case of health being understood as contributor to sustainable development, gains in implementing initiatives such as universal health coverage and fostering a more healthy population can contribute to poverty reduction and increased economic growth, resulting in progress towards creating sustainable livelihoods. This year's edition of the Review has begun to cover many of these issues and will continue to do so in future editions.

René English and Ashnie Padarath

Health Systems Trust



Legislation and Financing



Health Policy and Legislation



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The statute books reflected no new health-related legislation passed in 2011/12. Only two health-related Bills are currently before Parliament – the National Health Amendment Bill (Bill 24 of 2011) and the Mental Health Care Amendment Bill (Bill 39 of 2012).

On the basis of the deliberations before the Portfolio Committee on Health, extensive amendments to the National Health Amendment Bill can be expected. This Bill will introduce the Office of Health Standards Compliance as an independent structure outside of the Department of Health. However, the means to ensure its independence are still being debated.

The major policy focus remains the planned introduction of National Health Insurance, for which a Green Paper was released for comment in August 2011. The Green Paper has been criticised for lacking many critical details, and the White Paper is eagerly awaited.

In terms of secondary legislation, the most controversial is probably the draft Regulations issued in terms of the Tobacco Products Control Act. There has been no obvious progress in implementing the Medicines and Related Substances Amendment Act of 2008, and the 2011 draft Bill (containing further amendments) has not yet been tabled in Parliament. Despite this, the South African Health Products Regulatory Authority is expected to be in operation by April 2013.

The major policy focus remains the planned introduction of National Health Insurance. A Green Paper was introduced in August 2011 and a White Paper is eagerly awaited.

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Introduction

As in 2010-2011, the statute books reflected no new health-related legislation passed in 2011-2012. The list of laws for which the Minister of Health bears responsibility therefore remains as catalogued in the corresponding chapter of the *South African Health Review (SAHR)* of 2011.¹ The 2010-11 Annual Report of the National Department of Health (NDoH) also provides an extensive listing of the non-health-related legislation with which the NDoH (and, by extension, the health system) is expected to comply.²

This chapter focuses on those health-related legislative instruments that have been the subject of change since 2011. In the main, they are secondary and tertiary legislation, in the form of Regulations published for comment or finalised by the Minister of Health, or Board Notices issued by statutory health councils. Given the ire that telemedicine has raised in recent years, an elaboration of the legislative barriers to the practice of telehealth and, in particular, electronic prescribing is provided. In addition, the effect of intellectual property law on access to medicines and other health technologies and the expected policy developments in this space are covered in some detail. A number of court actions of relevance to health are also covered.

No new provincial health legislation has been produced in the period under review and, as before, no review of health-related municipal by-laws has been attempted in this chapter. In terms of new policy, few documents were issued in 2011-2012, and attention is still firmly focused on the promised White Paper on National Health Insurance (NHI).

Health-related legislation

The National Health Act³

Efforts to redirect South Africa's health policy are underway, with the introduction of a form of National Health Insurance (NHI). A final policy document, in the form of a White Paper, is believed to be imminent.

Much attention has been paid to the process of 'piloting' the NHI policy in 10 selected districts, across all nine provinces. The NDoH's Annual Performance Plan 2012/2013 explains the intended process clearly.⁴ The draft NHI policy document, approved by Cabinet, was published for public comment in the form of a Green Paper in August 2011.⁵ The initial two-month comment period was extended to the end of December 2011.⁶ The NDoH Annual Report documents the extensive feedback received in response to the Green Paper following its release for comment on 12 August 2011. In addition, the Department arranged a two-day national health consultative forum in December 2011, in the form of the National Health Insurance Conference. Additional community dialogues on the NHI Policy are also planned for 2013.

The Green Paper proposes that the NHI should be implemented "gradually in three phases over a 14-year period starting in 2012". The first phase (five years) involves "policy and legislative reform, strengthening of the health system, improving the service delivery platform and piloting various components of the NHI". The Department has specifically recognised that an important prerequisite for the NHI will be the strengthening of the public health system:

In the first five years strengthening of the health system in preparation for the full roll-out of the NHI will focus on improving the management of health facilities and health districts including hospital CEOs; quality improvement; infrastructure development; improvements to medical equipment and supplies; human resources planning and development; information management and system support; and in the latter years of the first phase, the establishment of the NHI Fund.

The initial focus of the 10 selected pilot districts is therefore predominantly on the functioning of the public sector, rather than on the integration of the public and private sectors that will be necessary once the NHI Fund is in place – "The pilot districts will test innovations that are necessary for implementing the NHI whilst also strengthening the functioning of the district health system".⁴ Each pilot district aims to develop systems and frameworks that will enable the implementation of the NHI. These include establishing district health authorities that will be capable of contracting for services from a range of providers, and strengthening the district health management teams. The business plans for each of the pilot districts are accessible from the NDoH's website.

Each pilot district also focuses on strengthening health systems. In line with the focus on maternal and child mortality, these systems-strengthening efforts take the form of "re-engineering" interventions: the deployment of district specialist teams, school health teams and municipal based outreach teams. In 2012, the Integrated School Health Policy was issued jointly by the Departments of Health and Basic Education.⁷ The issues covered by this policy include nutrition and exercise, personal and environmental hygiene, chronic illnesses (including HIV and tuberculosis (TB)), and abuse (sexual, physical and emotional abuse, including bullying and violence). The policy also deals with sexual and reproductive health, menstruation, contraception, sexually transmitted infections (including HIV and AIDS) and male circumcision (including male medical circumcision). In addition, teenage pregnancy, termination of pregnancy, prevention of mother-to-child transmission of HIV, HIV counselling and testing, stigma mitigation and mental health issues (including drug and substance abuse, depression, anxiety and suicide) are covered by the policy.

The Annual Performance Plan also lists other key preparatory steps that are being taken in anticipation of the NHI rollout. These steps include "the establishment of the Office of Health Standards Compliance; the audit of public health facilities aimed at improving quality; appointment of District Clinical Specialist Support Teams; training of Primary Health Care Agents; and improving Information Management and Systems Support". The first of these requires the passage of the National Health Amendment Bill, which was tabled in late 2011.⁸ This section 76 Bill (an ordinary Bill that affects the provinces and therefore requires attention by the National Council of Provinces and the National Assembly) has been referred to the Portfolio Committee on Health. The committee was briefed by the Minister of Health and a team from the Department in February 2012. Public hearings were then held on two days in March 2012, and were addressed by a wide range of industry bodies and professional associations. Towards the end of May 2012, the NDoH addressed the committee in response to the submissions made.

In the notes of this meeting prepared by the Parliamentary Monitoring Group, it was clear that the major issue in contention was the independence of the proposed Office of Health Standards Compliance (OHSC).⁹ The Bill aims to substitute chapter 10 of the National Health Act (Act 61 of 2003) with a new version, which creates the OHSC as a juristic body outside of the NDoH.

The Parliamentary Legal Adviser drew the attention of the committee to the 2011 Constitutional Court ruling commonly known as “Glenister”.¹⁰ This judgment dealt with the establishment of the Directorate for Priority Crime Investigation (the “Hawks”), which replaced the Directorate of Special Operations (the “Scorpions”), and the extent to which the new structure was truly independent of political influence. Both the Parliamentary Legal Adviser and the Director-General of Health appeared to support the establishment of a governance structure, in the form of a board, to provide oversight for the Chief Executive Officer (CEO) as envisaged by the Bill. On the following day, the Director-General further informed the committee that Cabinet had requested an additional amendment, to change “port health services” from a provincial to a national competence.^a

Further deliberations were held in mid-June 2012, again attended by the Director-General. Although a list of amendments agreed to by the committee, which included the creation of a board for the OHSC, was discussed, a new version of the Bill has yet to be issued. As noted by the Parliamentary Monitoring Group, the proposed board was to consist of the:

Chief Executive Officer, the Chief Financial Officer, the Director-General, or an official designated by that person, four members who had specialist knowledge of economics or accounting, legal matters, quality assurance, health research or epidemiology, one member nominated by the national Minister for Trade and Industry, and one representative each from the private healthcare industry, organised labour or civil society or the community.¹¹

Whether this will be sufficient to address stakeholders’ concerns about the independence of this structure, and its ability to resist political influence, remains to be seen. As yet, no firm timeline has been set for the completion of the remaining steps in the legislative process. However, the OHSC is considered to be a key preparatory step towards implementing the NHI and is, therefore, expected to enjoy priority.

The 2010/2011 Annual Report of the NDoH stated that “[d]uring the period under review, we have processed and published 60 regulations to ensure the full force and effect of the National Health Act of 2003”.² The 2011/2012 Annual Report indicated that 104 Regulations had been produced during the financial year “to provide the legislative framework required to enhance the performance of the health sector”.¹² The following final Regulations were issued in March 2012:

- Regulations relating to artificial fertilisation of persons,¹³
- Regulations regarding the rendering of a clinical forensic medicine service,¹⁴

^a Port health services are responsible for the monitoring and evaluation of all foodstuffs, cosmetics, disinfectants, hazardous substances and medicines entering the country through ports and airports. In addition, port health officers are responsible for preventing the entry of contagious diseases such as yellow fever, cholera, plague and Severe Acute Respiratory Syndrome.

- Regulations relating to the use of human biological material;¹⁵
- Regulations relating to the registration of microbiological laboratories and the acquisition, importation, handling, maintenance and supply of human pathogens;¹⁶
- Regulations relating to blood and blood products;¹⁷
- Regulations regarding the general conduct of human bodies, tissue, blood, blood products and gametes;¹⁸
- Regulations relating to the import and export of human tissue, blood, blood products, cultured cells, stem cells, embryos, zygotes and gametes;¹⁹
- Regulations relating to tissue banks; and²⁰
- Regulations relating to stem cell institutions or organisations.²¹

With these final Regulations in place, a number of sections of the Act that were brought into effect on 10 May 2010, including sections 55, 56 and 68, could become fully operative.²² A commencement notice issued on 27 February 2012 brought sections 11, 35, 41 to 46, 50 to 54, 57 to 67, 71 and 93 into operation from 1 March 2012.²³ This means that, apart from those sections being amended, the National Health Act has now been promulgated in its entirety.

Although a detailed description of the extensive provisions included in these finalised Regulations is beyond the scope of this chapter, a number of elements can be highlighted where actions that stem from the new Regulations will need to be taken. The Regulations on artificial fertilisation require the Director-General to “establish an electronic central data bank into which all information regarding gamete and embryo donations is stored” (Regulation 5). These Regulations also limit the number of zygotes or embryos that can be implanted (Regulation 12) and prohibit pre-implantation and prenatal testing for selecting the sex of a child, except in the case of “serious sex linked or sex limited genetic conditions” (Regulation 13).

Clinical forensic medicine services are defined as those required “in the determination of cause and manner of injuries to living victims of sexual assault”. In this regard, the Regulations also create a new advisory structure, the National Forensic Medicine Service Committee, to advise the Minister on policy, norms and standards in this field (Regulations 15 and 16). The Regulation on the use of human biological material permits the use of excess embryos obtained from in vitro fertilisation to produce embryonic stem cell lines, for the purposes of research (Regulation 7). The Regulations regarding the general conduct of human bodies, tissue, blood, blood products and gametes contain an interesting requirement that the registers maintained by recipients of tissues or bodies record the “name, population group, sex and age at the time of death of the deceased concerned” (Regulation 16). This is a rare mention of ethnicity in a post-apartheid legal instrument and may prove challenging to comply with in some circumstances. No rationale for its inclusion has been offered.

A number of Regulations intended to be issued in terms of the National Health Act, which was passed by Parliament in 2003, have not yet been finalised. Some, such as the Regulations intended to deal with “the development of an essential drugs list and medical and other assistive devices list” (as provided for in section 90(1)(d)), have yet to be drafted. A 2008 judgment of the Cape High Court drew attention to the impact of such delays.²⁴

In this case, which dealt with the compulsory admission and continued isolation of extensively drug-resistant TB patients, it was pointed out that the National Health Act did not provide for the powers necessary to effect such admissions and isolation, but that these powers were expected to be dealt with in the Regulations. However, the Regulations were still in draft form only. Although existing Regulations published in terms of the 1977 Health Act were still in place, the court noted that “it was argued, these regulations have become ‘practically unworkable’ due to the repeal of large parts of the previous Health Act” (para 51). Despite finding grounds to order the admission of the respondents of the case, the court noted that “it is undoubtedly preferable that the full statutory and regulatory framework be put into place and implemented as soon as practically possible” (para 58).²⁴

A draft policy document on the management of public hospitals and the accompanying draft Regulations, which relate to categories of hospitals and had been published for comment in August 2011, were issued in final form in March 2012.^{25,26} The document stipulates the post level for managers of district- (level 12), regional- (level 13), tertiary- (level 14) and central hospitals (level 15). More importantly the document requires that every hospital CEO holds a “degree/advanced diploma in a health-related field”, with a “degree/diploma in management” as an “added advantage”. General requirements for the members of hospital boards are set out, and guidance on selection criteria provided (although these criteria are vague and open to interpretation; for instance, prospective board members are required to “think strategically” and “communicate effectively”).

The classification scheme described in the policy refers to public sector hospitals only (and requires that they be managed in accordance with a policy to be determined by the Minister). The Regulations include two categories of private hospitals (for-profit and not-for-profit). As was noted when the draft versions were published, the Regulations were issued in terms of section 35 of the National Health Act, which requires the Minister to “classify all health establishments”. This is a necessary step before the remaining provisions in chapter 6 of the Act, notably the certificate of need (section 36), can be implemented. The mere designation of private hospitals as ‘for-profit’ or ‘not-for-profit’ would not suffice for this purpose. The certificate of need therefore remains an elusive and, perhaps, abandoned concept.

The National Health Act has been cited in two additional documents. In May 2012, the Minister approved a document entitled “Policy Framework for the Ethics Approval and Endorsement of Health Research by the National Department of Health”.²⁷ Although the framework does not provide any new requirements for researchers, it does summarise the various ethical and regulatory approvals that are required for clinical trials and other research. In June 2012, the Minister established a National Advisory Committee on the Prevention and Control of Cancer to advise him on “all matters related to the National Prevention and Control of Cancer”.²⁸

Tobacco Products Control Act²⁹

Considerable controversy has followed the publication of draft Regulations in terms of the Tobacco Products Control Act (Act 83 of 1993) in March 2012.³⁰ The draft Regulations prohibit smoking in any “public place”, and also in a range of “outdoor public places” such as:

- a) stadiums, arenas, sports facilities, playgrounds, zoos;
- b) premises of schools, or child care facilities;
- c) health facilities;
- d) outdoor eating or drinking areas;
- e) venues when outdoor events take place;
- f) covered walkways and covered parking areas;
- g) service areas and service lines; and
- h) beaches where public bathing is permitted, not less than 50 metres away from the closest person near the demarcated swimming area.” (Regulation 2)

In addition, smoking is to be prohibited “within a 10 metre distance from a window of, ventilation inlet of, doorway to or entrance into a public place”. Those in charge of public places or workplaces are to be allowed to designate outdoor smoking areas (Regulation 4), provided that these areas are not “adjacent to an entrance to the premises” or “to walkways and other areas where persons generally congregate or walk”. Such areas are also to be out of bounds for anyone under 18 years of age; may not permit the serving of food or refreshments or the provision of entertainment; and are to have ashtrays installed and cleaned regularly. Smokers are to be discouraged from “remaining in the area longer than is necessary to smoke a cigarette” (Regulation 5). However, public places and workplaces can also be declared smoke free.

Predictably, these draft Regulations have been lauded by the National Council Against Smoking and attacked by the industry and various free market advocates. For instance, the executive director for the Free Market Foundation was quoted as characterising the Regulations as a “vicious assault on people’s lifestyle choices” by “nicotine nazis”.³¹ The same media report quoted the CEO of the Tobacco Institute of Southern Africa, who noted that the Tobacco Products Control Act 1993 made provision for the Minister to prescribe Regulations for designated indoor smoking areas, but that the draft Regulations prohibited smoking outdoors. The Tobacco Institute of Southern Africa believed this was “not in line with the spirit and purpose of the Act”.

In its response, British American Tobacco South Africa pointed to the expense the hospitality industry had incurred in providing designated smoking areas in public places and stated:

We believe that the government should allow the owners of businesses in the hospitality industry to continue making provisions for adult smokers as they account for a significant percentage of their revenue. That being said, we strongly support the fact that these designated smoking areas must be equipped with adequate air extraction in, for example, nightclubs, bars and cafes.³²

British American Tobacco South Africa's Head of Corporate and Regulatory Affairs asked:

In other countries around the world, where indoor smoking has been banned, smokers are allowed to smoke right outside pubs and restaurants. Should the regulation be passed in its current format, this won't be possible in South Africa (SA) as no-one will be able to smoke within 10 metres of a door or window. Can you imagine how that will impact upon businesses?

Support for the draft Regulations has come from a range of actors, including the South African Medical Association, the Junior Doctors Association of South Africa, the Cancer Association of South Africa, the Heart and Stroke Foundation and the Public Health Association of South Africa.³³

A key element of the existing smoking legislation was tested in the courts in 2012.³⁴ A decision of the North Gauteng High Court was upheld by the Supreme Court of Appeal, although with the costs order set aside. This judgment confirmed that the provisions of the Tobacco Products Control Act relating to restrictions on advertising and promotion were constitutional. It was held that the restriction imposed on the right of expression (in the form of commercial speech) was both justified and proportional. The Act prohibits not only the advertising of tobacco products but also the indirect marketing of these products, such as through sponsorships. In particular, SA's obligations as a signatory to the 2005 Framework Convention on Tobacco Control (WHO FCTC) were emphasised. In this regard, it is worth noting the theme of World No Tobacco Day 2012, which was "tobacco industry interference".³⁵ In announcing the theme, the World Health Organization (WHO) noted that:

As more and more countries move to meet their obligations under the WHO FCTC fully, the tobacco industry's efforts to undermine the treaty are becoming increasingly energetic. For example, in an attempt to halt the adoption of pictorial health warnings on packages of tobacco, the industry recently adopted the novel tactic of suing countries under bilateral investment treaties, claiming that the warnings impinge on tobacco companies' attempts to use their legally registered brands. Meanwhile, the industry's attempts to undermine the treaty continue on other fronts, particularly with regard to countries' attempts to ban smoking in enclosed public places and to ban tobacco advertising, promotion and sponsorship. World No Tobacco Day 2012 aimed to educate policy makers and the general public about the tobacco industry's nefarious and harmful tactics.

Although no draft legislation has yet been developed, there have been indications that the Minister of Health plans to address alcohol-related legislation.³⁶ Speaking in Mpumalanga in March 2012, he stated:

I'm taking over from where Dr Dlamini-Zuma left off ... I'm going to ask Parliament to pass a law that no alcohol adverts be played on TV or radio.³⁷

In the July 2012 issue of the *South African Medical Journal*, Parry et al. presented the public health case for a total ban on alcohol advertising.³⁸

Medicines and Related Substances Act³⁹

Two issues predominated in relation to legislation pertaining to medicines in 2011-2012: the promised move to establish the South African Health Products Regulatory Authority, and the ongoing medicines pricing interventions.

The Medicines and Related Substances Amendment Act (Act 72 of 2008), which provides for the creation of the South African Health Products Regulatory Authority, has been assented to by the President, but no sections have yet been promulgated.⁴⁰ Although an external consultant-led task team has been established within the NDoH to facilitate the creation of the new authority, the process followed has been opaque and little visible evidence of progress exists, despite predictions that the authority would be in place by April 2013.

A draft Bill to amend the Medicines Act further was published for comment in March 2012.⁴¹ No explanatory text was provided, so the intent of the draft Bill is difficult to gauge. However, one intention seems to be to re-focus some of the key provisions of the Act back onto "medicines" and not the catch-all phrase "products". This would, presumably, allow for a more directed regulatory process for medical devices, in vitro diagnostic devices and other health products that fall within the ambit of the authority. In this regard, it was notable that the draft Bill extended the remit of the authority to include foodstuffs, cosmetics, and (presumably) disinfectants. As drafted, the Bill states that "[t]he Authority is responsible for the regulatory oversight of cosmetics and foodstuffs as defined in terms of the Foodstuffs, Cosmetics and Disinfectants Act, 1972 (Act 54 of 1972)". Accordingly, a "health product" is redefined as being "a medicine, scheduled substance, medical device, IVD, cosmetic or foodstuff".

Little clarity is provided in the draft Bill about the modus operandi of the proposed authority. The authority is merely re-positioned as "an organ of state within the public administration but outside the public service". As a result, the draft Bill provides that the following components of the NDoH will cease to exist and "together with their employees be incorporated into the Authority": the Cluster Pharmaceutical, Trade and Product Regulation; the Directorate Radiation Control; the Directorate Health Technology; and the Directorate Food. The balance of the transitional arrangements in the Bill deal with labour and tax issues, applications for registration of medicines in process at the time of the transition, moveable assets and monies owed.

No advisory structures are mentioned in the Bill other than the committee provided for in section 4 of the Act, as amended by the 2008 Amendment Act, which is to "advise or act as a consultative body for the Minister and the Authority on matters concerning corporate governance of the Authority". It has been suggested that national and international best practice requires an independent board located at the centre of the corporate governance framework.⁴² This requirement should not be left to be inserted by means of Regulations, but should be integral to the Act itself. However, in other medicines regulatory authorities, extensive use is made of expert committees, which can advise the staff on technical issues. The US Food and Drug Administration, for instance, has advisory committees on human medicine, veterinary medicine, blood, vaccines and biological products, food, medical devices

and radiation-emitting products, and tobacco, among others. The extent to which such advice is binding on the authority and the extent to which it is made public are key design elements of the system.

One of the most important enabling changes in relation to the proposed authority will be in the scale of fees charged. The 2008 Ministerial Task Team report recommended a 50% cost recovery in the form of fees. It was therefore notable that the fees charged for a number of items in terms of the existing legislation were increased markedly in July 2012.⁴³ For example, the fees for generic medicine registrations were increased from R12 500 to R25 000 per application, new licence fees for manufacturers from R3 500 to R20 000, and renewals from R3 500 to R17 500. The inspection fees for international manufacturing sites were increased from R400 per hour to R3 600 per hour.

Perhaps linked to the delay in instituting the authority, no final versions of the draft General Regulations to the Medicines Act – issued for comment in July 2011 – have been issued. These were to establish a regulatory system for the assessment of medical devices and to amend the existing General Regulations.^{44,45} As was noted in the 2011 issue of the SAHR, while some of the proposed changes were uncontroversial, the change that created a new definition for “complementary medicine” was likely to be contested by some actors.¹ No progress was apparent in 2011-2012, beyond an extension of the period allowed for submission of comments (to 30 November 2011).⁴⁶

The medicines pricing system has also continued to evolve. In January 2012, the Minister set the maximum increase for single exit prices for the year at 2.14% and stipulated the information that was to be submitted by manufacturers and importers in relation to their single exit prices.^{47,48} The information provided was then used to populate the medicines price database maintained by the NDoH. In relation to the challenging issue of regulating dispensing fees in the private sector, the Minister published a notice in July 2011 that called for the submission of prescribed data by pharmacists, for the annual review of the dispensing fee.⁴⁹ In June 2012, the Minister decided, on the recommendation of the Pricing Committee, that because of the poor response about expenditure information “a determination regarding a revised fee for 2012 could not be conducted”.⁵⁰ Comment on this decision was invited within three months, with a promise that the issue would receive priority in 2013. The Minister also warned that this “requires co-operation from pharmacists with regards to supply of relevant information relating to dispensing”.

Also related to medicines pricing, the Minister published another set of draft Regulations in July 2012, which provided further details on what would be considered a “bonus system, rebate system or any other incentive scheme”.⁵¹ This attempt to remove perverse practices that had emerged since the introduction of the single exit price was broadly welcomed. More details were also provided on what would be covered by the logistics fee, and a definition for a “logistics fee cap” was introduced. The logistics fee relates to a proportion of the single exit price that is paid by manufacturers to logistics service providers (wholesalers and distributors). At present, while the medicines price database shows a logistics fee for each medicine, this amount is not available to all logistics service providers. The actual fees paid are not transparent and are

negotiated between each manufacturer and each logistics service provider.

No finality has been reached in relation to two draft Regulations issued in December 2010 (in relation to the methodology for international benchmarking of medicine prices)⁵² and March 2011 (in relation to capping the logistics fees).⁵³

Foodstuffs, Cosmetics and Disinfectants Act⁵⁴

Despite the signalled move to the new South African Health Products Regulatory Authority, considerable action has taken place in relation to the regulation of foodstuffs. In October 2011, the Minister issued Regulations that prohibited the manufacturing, importation, export and sale of polycarbonate infant feeding bottles containing bisphenol A, on the basis of toxicity concerns.⁵⁵ Three sets of draft Regulations have also been issued for comment: these relate to the use of sweeteners in foodstuffs,⁵⁶ to foodstuffs for infants and young children,⁵⁷ and to reducing the sodium content of a range of foods – including bread, butter spreads and processed meats.⁵⁸ Each can be seen as an extension of an existing policy, such as promoting breastfeeding and addressing the contributory causes of non-communicable diseases. The restrictions on the marketing of breast-milk substitutes and infant foods were issued in final form in early December 2012.⁵⁹ In essence, these bring local regulation in line with the intent of the International Code of Marketing of Breast-Milk Substitutes, which has been in place for more than 30 years.

Mental Health Care Act⁶⁰

Late in the 2012 Parliamentary term, a Bill was introduced to amend the Mental Health Care Act (Act 17 of 2002).⁶¹ The provisions of the Bill are technical in nature and do not appear to be controversial. The Bill’s first aim was to enable the Director-General of the NDoH to delegate certain powers to officials within the NDoH in relation to the care of involuntary healthcare users. For example, this might entail the transfer of state patients from detention centres to health establishments, as ordered by a court. The second target of the Bill might be referred to as “house-keeping”. When the Mental Health Care Act was first passed in 2002, the laws repealed in terms of section 73 of the Act included the Mental Health Care Act (Act 8 of 1973), but not chapter 8 of that Act. Chapter 8 of the 1973 Act dealt with the establishment and operation of hospital boards. As these functions are now covered by chapter 6 of the National Health Act, the 2012 Amendment Bill aim to repeal the remaining chapter of the 1973 Act. This Bill is expected to be handled by Parliament in terms of section 75 of the Constitution, as an ordinary Bill not affecting the provinces.

Statutory health councils

No major changes to the primary legislation governing professions registered with the various statutory health councils occurred in the period under review. However, a steady stream of secondary and tertiary legislation was issued, in the form of Regulations and Board Notices.

Health Professions Council of South Africa

A large number of draft and final Regulations relevant to the Health Professions Council of South Africa (HPCSA) and the Health Professions Act were issued by the Minister of Health. These included:

- Final Regulations relating to the qualifications for speech therapists, audiologists and hearing aid acousticians;⁶²
- Final Regulations on the scope of the profession of psychology;⁶³
- Draft Regulations defining the scope of the profession of audiology;⁶⁴
- Final Regulations relating to the qualifications of dental assistants;⁶⁵
- Draft Regulations relating to the qualifications of environmental health officers;⁶⁶
- Draft Regulations relating to the education of audiologists;⁶⁷
- Draft Regulations relating to the education of speech language therapists;⁶⁸
- Final Regulations relating to the registration of various categories of medical technicians;^{69,70,71}
- Draft Regulations defining the scope of the profession of environmental health officers;⁷²
- Draft Regulations relating to the registration of speech language therapy students;⁷³
- Final Regulations relating to the registration of intern psychologists;⁷⁴
- Final Regulations relating to the registration of student dental assistants⁷⁵ and defining the scope of their profession;⁷⁶ and
- Final Regulations relating to the qualifications of biokine-ticists.⁷⁷

In 2012 the HPCSA gazetted Board Notices in relation to the registration of additional qualifications for speech therapists and audiologists,⁷⁸ and for medical practitioners and dentists.⁷⁹ While each of these pieces of secondary and tertiary legislation provides an important part of the mosaic of health professions regulation, no wide-ranging changes to existing scopes of practice or educational processes have been made.

South African Pharmacy Council

Few new documents have been issued in relation to the South African Pharmacy Council (SAPC). Final versions of the draft Regulations on continuing professional development, published for comment in May 2011, have not yet been issued.⁸⁰ Also no apparent progress has been made in the planned introduction of a new category of authorised pharmacist prescribers, and new categories of pharmacy support personnel (to be termed “pharmacist’s assistants”, “pharmacy technical assistants” and “pharmacy technicians”).^{81,82}

In addition, no finality has been reached in the dispute between the NDoH and the SAPC in relation to the dispensing of prescriptions written by health personnel other than medical practitioners and dentists. This has also now affected the new cadre of clinical associates, with the SAPC issuing an official statement to the effect

that any prescription written by such a person will have to be signed in person by a medical practitioner before it can be dispensed by a pharmacist.⁸³ This will limit the usefulness of clinical associates and place an added burden on the medical officers with whom they work. This issue was not, however, raised in a review of the clinical associate programme published in November 2012.⁸⁴

South African Nursing Council

As was highlighted in the 2011 issue of the SAHR, there has been considerable confusion over prescribing and dispensing by nurses.¹ Without the necessary Regulations to allow for the operation of section 56(1) to (5) of the Nursing Act (Act 33 of 2005), the only mechanism available to enable nurses to prescribe remains that provided by section 56(6). In accordance with the transitional arrangements, any nurse issued with a section 38A permit in terms of the 1978 Nursing Act can continue to practise as enabled by that permit, and the Regulation that covered such permits is still used in relation to section 56(6) permits.⁸⁵ The draft Regulations published for comment in December 2011, which deal with prescribing and dispensing, were therefore an important step.⁸⁶

A problem exists in that the draft Regulation has conflated these two parts of section 56 and is therefore not in accordance with the requirements of either. Instead of specifically dealing only with the requirements for a nurse to be authorised in terms of section 56(6), draft Regulation 3 includes elements that appear to be more relevant to section 56(1) to (5). These elements include the requirement for “proof of payment as outlined in section 58(1)” and “evidence of requisite training and competency achieved”. Section 56(6) of the Nursing Act makes no mention of training or competency, only the place of employment. In the past, nurses issued with section 38A permits were given in-service training, but were not required to have completed any designated qualifications.

Section 56(6) also starts with the clear statement that it must be read “[d]espite the provisions of this Act, the said Medicines and Related Substances Act, 1965, the Pharmacy Act, 1974 (Act No. 53 of 1974), and the Health Professions Act, 1974 (Act No. 56 of 1974)”. This statement has been interpreted as allowing a nurse who operates in terms of this section to dispense medicines to her own patients, without having to hold a section 22C(1)(a) dispensing licence. This was certainly the case with nurses authorised in terms of section 38A and informed the design of the 1984 Regulations. However, sub-regulation 4(1) demands that a nurse, in order to be authorised, “[h]olds a relevant qualification in terms of section 56(1) of the Act” and “[h]as successfully completed a relevant dispensing course that is accredited by the South African Pharmacy Council”. A nurse who is not an authorised prescriber in terms of the Medicines Act (i.e. has not been deemed competent by the Nursing Council) cannot complete the dispensing course approved by the Pharmacy Council and cannot apply for a dispensing licence.

Draft Regulation 10 required the authorising person to keep a register of such authorisations and to provide this to the South African Nursing Council (SANC) each year. While onerous, and not specifically enabled by the Act, a publicly accessible register of nurses authorised in terms of section 56(6) would be useful. Those nurses who eventually meet the requirements for section 56(1) to (5) will appear in the specialist registers maintained for that purpose. However, this will only occur once the qualification has been specified by the council and implemented by the appropriate

providers of nursing education. No such qualifications have yet been specified.

Extensive draft Regulations that deal with the accreditation of nursing education institutions were issued in 2011.⁸⁷ Appended to these draft Regulations was the competency framework for nursing practice. Among the assessment criteria for professional nurses was this statement: "Pharmacological preparations and treatment are managed in ways that ensure the correct storage of drugs, and the correct preparation and administration of pharmacological treatment." This seems to cover the conventional role of the nurse and not the roles of prescribing or dispensing. However, another statement reads: "Childhood illnesses, minor and common ailments are accurately diagnosed and managed according to generally accepted treatment guidelines." This seems to be akin to what is expected of the current primary healthcare nurse practitioners, who are enabled with a section 56(6) permit.

In August 2011, the Minister published draft Regulations that deal with the conduct of inquiries into alleged unfitness to practise due to disability or impairment.⁸⁸ Other draft Regulations issued in 2012 deal with the minimum requirements for registration by professional nurses,⁸⁹ staff nurses,⁹⁰ maintenance of registers,⁹¹ and the conduct of inquiries into alleged unprofessional conduct.⁹²

Allied Health Professions Council of South Africa

In November 2011, the Allied Health Professions Council of South Africa (AHPCSA) issued a Board Notice that declared any involvement by a practitioner registered in terms of the Act in a telemedicine scheme as unprofessional conduct. Telemedicine was defined as unprofessional conduct, as it was held to constitute "a breach of patients' rights".⁹³

Interim Traditional Health Practitioners Council of South Africa

In August 2011, the Minister of Health published a final Regulation providing for the appointment of members of the Interim Traditional Health Practitioners Council of South Africa.⁹⁴ Nominations were then called for, with a due date of 31 January 2012. Research conducted in 2012 by Mbatha et al. identified the establishment of this council as a key step in ensuring the acceptance by employers of sick certificates issued by traditional health practitioners.⁹⁵ Such certificates are not currently recognised in terms of the Basic Conditions of Employment Act, but are accepted by some employers. These authors estimated that there are about 200 000 traditional health practitioners in SA, who belong to over 100 separate organisations.

Telemedicine – legislative barriers

The potential that eHealth offers for making health systems more efficient was acknowledged in a World Health Assembly resolution in 2005.⁹⁶ For various reasons this expectation of technology has not been realised globally, and not been matched by uptake and utilisation in practice.⁹⁷ A National eHealth Strategy for South Africa 2012/13-2016/17 was issued in July 2012.⁹⁸ This document includes under the umbrella of eHealth the domains of telemedicine, mobile (or mHealth) interventions and all information and communication technologies for supporting, facilitating and

strengthening health care.

Telemedicine uses information and communication technologies to deliver healthcare over a distance.⁹⁹ The World Medical Association defines telemedicine broadly as "the practice of medicine over a distance, in which interventions, diagnostics and treatment decisions and recommendations are based on data, including voice and images, documents and other information transmitted through telecommunication systems".¹⁰⁰ Telemedicine is closely allied to "health information technology", which refers more commonly to electronic medical records and health information systems.

The strategy document reaffirms the commitment to realising the strategic objectives previously set out by the NDoH. The overall aim of this strategy is to provide a single, harmonised and comprehensive eHealth strategy that:

- supports the medium-term priorities of the public health sector;
- paves the way for future public sector eHealth requirements; and
- lays the requisite foundations for the future integration and coordination of all eHealth initiatives in the country (both in the public and private sectors).

Telemedicine has been on the NDoH's agenda since 1995, when the National Health Information Systems Committee of South Africa was established. This committee was tasked with the design of a comprehensive national health information system for SA. While progress has been slow, some success has been shown in the form of the District Health Information System (DHIS) and also in the 'paperless' Inkosi Albert Luthuli Central Hospital and eThekweni Hospital in Durban, KwaZulu-Natal.

In 2007 the HPCSA circulated draft clinical guidelines for the practice of telemedicine in SA to various experts for comment. These guidelines contained serious omissions and provisions that would significantly limit the uptake of telemedicine and have not yet been finalised. The guidelines that were available from the NDoH in 1998 had been adapted from a code of conduct for commercial product suppliers and were not relevant to clinical practice.¹⁰¹

Little consensus exists on the definition of an electronic health record. One definition that is generally accepted is "[a]n electronic record of health-related information on an individual that is created, gathered, managed, and consulted by authorized health care clinicians and staff."¹⁰² Efforts to introduce an electronic health record system date back to 2008, when the State Information Technology Agency (SITA) awarded a tender to provide the NDoH with a system to be known as eHR.za.¹⁰³ The SITA document outlining the National Strategic Framework for implementation in SA may be found on the internet, but does not reflect authorship or time frames.¹⁰⁴

Central to any discussion on patient records, whether in an electronic or paper format, is the need to ensure that the best interests of the patient are paramount. Privacy of patient information and proper informed consent are universal ethical concerns but seem to be a particular barrier when an electronic health record is integrated into a healthcare facility. In SA, the right to privacy and autonomy is recognised as a fundamental right in the Constitution, and specific legislation on health records requires a patient's consent before any information may be shared (National Health Act). Section 6(1) of

the National Health Act defines what constitutes proper informed consent, and section 6(2) states that the healthcare provider concerned must, where possible, provide relevant information to a user in a language that he or she understands and in a manner that takes into account the patient's level of literacy. Section 17 highlights security- and privacy-related issues and addresses the protection of health records. It states, for instance, that "the person in charge of a health establishment in possession of a user's health records must set out proper control measures to prevent unauthorised access to those records and to the storage facility in which, or system by which, records are kept".

Section 17 anticipates the potential for improper access to electronic records, and so includes as offences the acts of gaining unauthorised access to, or of intercepting, information without authority.

More broadly, the Electronic Communications and Transactions Act (Act 25 of 2002), referred to as the "ECTA", provides for the facilitation and regulation of electronic communications and transactions. An electronic health record would fall under the definition of an electronic transaction or communication, as provided in the Act. An electronic communication is defined as "a communication by means of data messages"; a transaction is "a transaction of either a commercial or non-commercial nature, and includes the provision of information and e-government services". Importantly, the Act defines an electronic signature as "data attached to, or incorporated in, or logically associated with other data, and which is intended by the user to serve as a signature".

Medical data are highly sensitive, and would therefore meet the criteria for "critical data", declared by the Minister in terms of section 53 to be of importance "to the protection of the national security of the Republic or the economic and social well-being of its citizens". "Personal data" is defined in broad and encompassing terms, and includes data on race, gender, sex, pregnancy, ethnic origins, blood type, and physical or mental health. Chapter 8 of the ECTA addresses the protection of personal information and sets out principles that must be adhered to when such information is collected. Specifically, section 51(1) states that "[a] data controller must have the express written permission of the data subject for the collection, collation, processing or disclosure of any personal information on that data subject unless he or she is permitted or required to do so by law".

The demands of both the National Health Act and the ECTA were highlighted when Discovery Health launched its Apple iPad application called HealthID in 2012.¹⁰⁵ The company described this as the "first electronic health record application of its kind in SA, which puts patients' health records in their doctor's hands". It elaborated on the application as follows:

The electronic health record is at the heart of the application, where valuable clinical information derived from claims data and from pathology laboratories is stored. Doctors are able to access their patients' data and details of their previous doctor and hospital visits. Doctors can view previously prescribed medicines, blood test results and patients' health measures such as body mass index and blood pressure ... HealthID will reduce the administration burden on doctors as they have the patient's information at their fingertips, which will enable them to apply online for chronic medicines and get real-time approval, as well

as to script medicines with full information on which medicines are covered. Very often a patient cannot remember the last time they suffered from a particular disease or, in the case of elderly patients, all the medication that they are currently on. HealthID will close this critical gap for patients and for doctors.

Patients were to be asked to provide signed consent, which could be achieved in real time by signing on the iPad screen, before allowing their medical practitioner to use the application. Whether this meets the requirements for proper informed consent continues to be debated among ethicists, as the process does not appear to provide the necessary information about risks, benefits, or costs.

In addition, questions have been raised about the validity of electronic prescriptions issued by means of this application. The existing General Regulations to the Medicines Act require that all prescriptions "must be written in legible print, typewritten or computer generated and signed in person by a medical practitioner, dentist, veterinarian or authorised prescriber".¹⁰⁶ This has always been interpreted by pharmacists as requiring a "hard copy" of any electronic prescription, and such copies are provided at the two hospitals (Inkosi Albert Luthuli Central Hospital and the eThekweni Hospital in Durban) that operate 'paperless' systems.

It remains to be seen whether the Medicines Act and its Regulations can be read together with the ECTA and an "electronic signature" deemed to meet the requirements of General Regulation 28. A joint communication from the Pharmacy Council and Medicines Control Council might assist in this regard; for instance, by clarifying whether "signed in person" is intended to mean "handwritten" or whether the definition can accommodate an electronic signature if accredited in terms of the ECTA.

Intellectual property – an unfinished agenda

Although a new intellectual property (IP) policy was to be released for comment by the Department of Trade and Industry (dti) in July 2012, this did not happen. A regulatory impact assessment of the draft policy was expected to serve before Cabinet in December 2012. The draft policy is therefore expected to be ready for public consultation in early 2013. An early draft has been circulated to certain interest groups. This draft proceeds on the basis that, while SA needs to align its policy and legislation to international treaties and norms, South African policy and legislation must be consonant with the developmental stage appropriate to the country. The objectives of the draft policy are therefore, among others:

to develop a legal IP framework to empower all strata of citizens; one that provides a conducive environment for economic opportunities; the policy is to apply alongside other government policies to contribute to development; it would interface with related new emerging issues; and to improve and strengthen enforcement.

The draft is presented in 17 chapters. Only those sections that have an impact on health are discussed here:

- Chapter 1 focuses on the four main types of IP: trademarks, copyright, patents and designs. It includes recommendations to amend legislation to incorporate the Doha Declaration "flexibilities" and incentive schemes in areas of IP that advance

developmental goals, such as poverty alleviation and health. It discusses the necessity for competition law to be applied to patent law where there is over-concentration, dominance or abuse by IP holders. It argues against “general blanket data protection” of information submitted to regulators, as this would frustrate generic entry. Interestingly, the document identifies the need to explore alternatives to IP such as subsidies or a prize fund, but does not develop this theme further.

- Chapter 2 deals with IP and its impact on public health. It recommends the use of compulsory licences and parallel importation to introduce affordable medicines, and the balancing of trade and health interests in patent protection. It points to the need for an increase in public funding for research and development into diseases of the poor, and suggests that IP, competition and trade policies be aligned with health policy objectives. It recommends that provisions for entry of generic competition be made, that trade and health departments reconcile their policy stances and address the pricing of drugs to ensure access, and that stricter rules apply to patenting.
- Chapter 5 deals with competition, public policy, compulsory licensing and technology transfer. It warns that trade and investment treaties pose the danger of undermining sovereignty, and recommends against adopting the World Intellectual Property Organization (WIPO) Roadmap. The Roadmap seeks a harmonised patent regime, which could lead to policy compromises.
- Chapter 8 deals with institutional capacity and notes that SA has weak institutional capacity and lacks skilled and experienced personnel. For this reason the country uses a depository system instead of a substantive search and examination method for patent applications. It recommends that the country’s meagre resources not be used for IP administration (presumably enforcement) and that it adopt a multifaceted approach for the registration of patents (a combination of the depository and examination systems).
- Chapter 9 deals with the international architecture of IP. The chapter points out that this is coordinated mainly by the WIPO and the World Trade Organization (WTO), which cater primarily for the needs of the developed countries and their private sectors. However, other organisations such as the WHO, World Customs Organization and other United Nations (UN) agencies are also affected. Further problems identified are: the problem that medicines in transit through Europe are impounded; the fact that WIPO technical assistance does not focus on flexibilities; and that developed countries demand the WTO’s Trade-Related Aspects of Intellectual Property Rights (TRIPS)-plus standards in negotiations with developing countries. It recommends that the dti “cautiously filter advices” coming from developed countries and institutions such as the WTO and WIPO and that SA not enter into trade agreements that undermine the exceptions and flexibilities it is entitled to or that are TRIPS-plus.
- Chapter 10 deals with IP and development, and notes that IP confers both costs and benefits to individuals, companies and society. It explains that developed countries used IP as a flexible tool to propel them to industrialisation but are now demanding ‘harmonisation’, which makes it virtually

impossible for developing countries to ‘catch up’. The chapter recommends the implementation of the Doha Development Agenda. It suggests reconciling IP and competition policy, increasing incentives for technology transfer, and increasing funding to promote indigenous scientific and technological capability. It also recommends that SA does not support the “global enforcement and harmonisation of patent” agendas.

- Chapter 15 deals with enforcement of IP. It puts forward a ‘bare minimum’ obligations approach and resistance to TRIPS-plus requirements in policy, law, and trade agreements.

The issue of IP and access to medicines remains a contested one. The recent judgment handed down in the Supreme Court of Appeal on 26 July 2012 in the matter between *Aventis Pharma SA and Others v Cipla Life Sciences and Others (with the Treatment Action Campaign (TAC) intervening as amicus curiae)*¹⁰⁷ – commonly known as the “Docetaxel” case – is examined here. While essentially a dispute about whether a holder of a pharmaceutical patent can obtain an interdict against an alleged infringer, this was a significant test case for the extent to which courts are required to apply broad constitutional principles (in this instance, the right of access to healthcare services and medicines) in IP disputes. The principle that public interest applies in IP disputes had already been established in a previous unsuccessful application for a compulsory licence.¹⁰⁸ The disputed patent in the “Docetaxel” case related to a composition of unpatented products that, when combined, facilitate the intravenous administration of docetaxel, a treatment for cancer. The holder of the patent (Aventis Pharma SA) maintained that the generic manufacturer (Cipla Life Sciences) had infringed its patent by registering and commencing the manufacture and marketing of a cheaper version of the medicine. Cipla countered that the patent was invalid on account of ambiguity and the lack of novelty and inventive step, essential requirements for patentability under South African law. A key complication is that the South African patents office does not conduct substantive examinations of the merits of each patent application, nor does any opportunity exist for an interested party to oppose such applications. For this reason these court proceedings presented a first opportunity for any tribunal to consider the substantive merits of the docetaxel patent.

In its submissions, the TAC argued, first, that the provisions of the Patents Act (Act 57 of 1978) must be interpreted in a manner consistent with the Constitution and the rights of the patent holder need to be balanced with those of people who require, but are unable to afford, the relevant medication. Second, when considering the requirement of ‘balance of convenience’ in interdict proceedings that potentially threaten the right to access medicines, the party requesting the interdict must prove that its grant will not harm the public interest. Third, while the evidence to enable the court to assess whether the rights of cancer patients would be harmed was inadequate, on the available information on record the interdict seeker failed to discharge its onus of proof. And, finally, it argued that, in line with courts in the United States of America (USA) and India, the Court must assess whether a satisfactory alternative remedy (such as damages) was available to the party seeking the interdict.

In its judgment, the Court accepted the TAC’s argument that the broader public interest, and not merely the interests of the litigating parties, ought to be considered in determining the balance of convenience in interdict proceedings. It cited both South African

and USA Supreme Court case law. However, the Court concluded that the public interest would not be served by denying an interdict on the facts of this case. It noted that Cipla's opposition was based on commercial considerations; namely, its need to establish a presence in the generics market. Furthermore, it noted that there was no evidence before it that Aventis could not continue to meet the demand for the medicine. Cipla was also unable to demonstrate that its product offered superior medicinal benefits, or more than a marginal saving on the cost of its generic version of Docetaxel in relation to Aventis' generic version (marketed as Docetere). And, finally, it held that there would be no material disruption of medicine supply to patients if the interdict was granted.

While the Court made a concession to the consideration of the public interest when determining the balance of convenience, its judgment was not unexpected given the constraints imposed by the legislation and the mindset of the judiciary.

The Court took a rather narrow view of the question of awarding damages (royalties) should the patent ultimately be found to be valid, holding that this would be tantamount to granting a compulsory licence. This approach is out of step with other jurisdictions such as India and the USA.

The decision once again highlights the need for the amendment of South African patent laws to specify and apply properly the strict standards of novelty and inventive step required for the granting of a patent. They should also prioritise the public interest in disputes concerning life-saving medicines.

The decision also highlights the perversity of the 'right' of patent holders to frustrate generic competition, and in this way access to cheaper medicines, by introducing their own generic versions when such a threat is imminent. While Cipla's commercial motives were foregrounded, the motives of Aventis in registering and marketing Docetere only at the stage that Cipla intended to produce a generic docetaxel were not investigated. Neither was an investigation conducted into the long-term impact of such practices on accessibility and affordability of medicines.

SA, like many middle-income countries and particularly those in the emerging Brazil, Russia, India, China, South Africa. (BRICS) group, is trying to balance industrial policy and concerns about access to healthcare technologies. In this regard the experiences of India are instructive for a number of reasons. India did not grant patent protection on medicines in terms of its 1970 patent legislation, an industrial policy choice that enabled it to grow its local pharmaceutical manufacturing capacity.¹⁰⁹ The proliferation of local companies that manufacture generic versions of medicines patented and marketed expensively elsewhere has enabled India to supply cheaper products to many countries in the developing and developed world. This practice has earned it the reputation of the 'pharmacy of the poor'.

When obliged to recognise pharmaceutical product patents in terms of the WTO's Trade-Related Aspects of Intellectual Property Rights Agreement, India included a number of important 'flexibilities' in its 2005 legislation, in order to facilitate access to affordable medicines.¹¹⁰ Two provisions, which relate to higher standards for patentability and to the issuance of compulsory licences, have already been tested. India has utilised section 3(d) of its Patents Act to deny Novartis a patent on the anti-leukaemia drug imatinib (sold as Glivec) on the grounds that it did not meet the patent

standards of being truly new and innovative. The decision has been challenged, and the case is proceeding.¹¹¹ India has also granted a compulsory licence for a generic version of Bayer's anti-cancer drug sorafenib (sold as Nexavar) on the basis that the local generic manufacturer Natco Pharma was able to supply the drug at 3% of Bayer's price, which was exorbitant.¹¹² Both these decisions by the Indian authorities are being challenged in the highest courts. Their outcomes are keenly awaited as they will determine India's future prospects as a major global supplier of low-cost essential medicines, and signal to other countries whether they should consider adopting these 'flexibilities' in their domestic legislation.

With these elements in mind, the following issues should be considered when finalising SA's IP policy:

- It is important that the policy objectives clearly focus on the developmental aspects of all policy in post-apartheid SA and are consonant with the country's development status. Further, the policy must benefit society as a whole, and ensure that it prioritises the most vulnerable and marginalised: the poor, sick, infirm, elderly, children and other disadvantaged sectors.
- The policy should be clear that extension to the patent period will not be permitted under any circumstances; Also, full disclosure in all pharmaceutical patent applications should be made, which includes the use of the international non-proprietary or generic name.
- Additionally, the policy should ensure that key flexibilities that facilitate access to medicines are incorporated. These flexibilities are strict patents standards; a proper examination system; opposition procedures before and after the grant of a patent; compulsory licences on all permissible grounds, including for public health purposes; and an expeditious administrative procedure to deal with applications for compulsory licences.
- Under no circumstances should data exclusivity be adopted. The current data protection rules, which protect clinical trial data submitted by an innovator from unfair commercial use but which allow a regulator to reference the data for the purpose of approving a generic equivalent, are fully TRIPS-compliant. They should not be tampered with, nor conceded in trade or other negotiations.
- It should be clarified that patents will not be granted for new uses and new formulations of existing medicines, that no legal barriers should be placed on parallel importation and compulsory licences, and that royalty rates should be legislated to facilitate licensing and avoid disputes in this regard.
- Clear guidelines should be drawn up for the examination of patent applications, with the public interest being paramount, and the right of interested parties to challenge such applications entrenched in law, as is the case with some jurisdictions.

The dti must consider the impact of IP on the development of local industry, as per its stated intentions in terms of both the proposed SA Pharmaceutical Sector Profile (unpublished) and the Industrial Policy Action Plan (2012/13-2014/15).¹¹³ In particular, it needs to acknowledge and address the reality that foreign pharmaceutical companies are the main beneficiaries of its lax patent laws and that, if examined properly, approximately 80% of patents would not have been granted.^{114,115}

Developing jurisprudence

In yet another decision that affects the health profile of SA's prison population, in March 2012 the Supreme Court of Appeal (SCA) held, in the case of *Minister of Correctional Services v Lee*, that a prisoner who became infected with TB while incarcerated in Pollsmoor Prison had failed to prove a causal link between his infection and his incarceration at the prison. This was despite the Court's accepting that the prison authorities had failed to take reasonable measures to prevent the spread of the causative agent.¹¹⁶

This matter was then taken on appeal to the Constitutional Court. The Court was asked to develop the common law of causation to the effect that this requirement will be satisfied where it is proved that the negligence of the prison authorities created a material increase in the risk of a prisoner being infected with TB, under the present conditions of chronic overcrowding and high TB infection rates. A spokesperson for the TAC, the Wits Justice Project and the Centre for Applied Legal Services, which were admitted as *amici curiae* in the matter, criticised the judgment of the SCA, stating that

[I]t held that Lee must either identify the 'source' of his infection or show that there would have been no risk of becoming infected if the prison authorities had not been negligent. The SCA thereby asked Lee to prove that which is impossible to prove.¹¹⁷

The judgment of the Constitutional Court was delivered in early December 2012.¹¹⁸ The majority (five of nine justices) held that the SCA, in applying the test for factual causation, had used an "inflexible kind of logic" (para 45) in the way that it applied the "but-for" test (*conditio sine qua non*). By this standard, they believed it unlikely that any prison inmate would ever be able to overcome the hurdle of causation. Instead, the Court stated that "[o]ur existing law does not require, as an inflexible rule, the use of the substitution of notional, hypothetical lawful conduct for unlawful conduct in the application of the but-for test for factual causation" (para 50). Put in simpler terms:

There was thus nothing in our law that prevented the High Court from approaching the question of causation simply by asking whether the factual conditions of Mr Lee's incarceration were a more probable cause of his tuberculosis, than that which would have been the case had he not been incarcerated in those conditions. That is what the High Court did and there was no reason, based on our law, to interfere with that finding. (para 55).

Accordingly, the order of the SCA was set aside and, Mr Lee having been successful, the case was referred to the Cape High Court for determination of the damages. The Constitutional Court judgment also echoed important sentiments expressed in the SCA ruling. It stated: "It is indeed so that [p]risoners are amongst the most vulnerable in our society to the failure of the state to meet its constitutional and statutory obligations", and that "a civilised and humane society demands that when the state takes away the autonomy of an individual by imprisonment it must assume the obligation ... inherent in the right ... to 'conditions of detention that are consistent with human dignity'" (para 65).

The minority judgment, while agreeing with the finding in favour of Mr Lee, took the view that the "Supreme Court of Appeal, having

concluded that the High Court judgment in Mr Lee's favour was unsustainable on the basis of the traditional 'but-for' test for causation, was therefore obliged to consider developing the common law" (para 111). This was because the result of leaving Mr Lee without a remedy was "unacceptable in our constitutional state" (para 97). The problem arises from "the rigidity of the common law test for causation, which requires claimants to prove more probably than not that the defendant's negligence caused their injury" (para 94). This means that the appropriate course would be to remit the matter to the trial court for it to consider "the manner in which the common law ought to be developed" (para 116).

Miscellaneous issues

The disposal of health-related waste has been of concern for some years, with periodic cases of improper disposal being reported in the media. It is therefore of interest that in 2012 the Minister of Water and Environmental Affairs published draft Regulations in terms of the National Environmental Management: Waste Act (Act 59 of 2008), which deal specifically with healthcare waste.¹¹⁹ Once finalised, these Regulations will need to be read together with other legislative measures. These include Regulations made in terms of the Medicines Act and the Good Pharmacy Practice standards issued by the SAPC, for instance.

A Bill that deals with the prevention and combating of torture may not, at first glance, be of direct relevance to the healthcare context.¹²⁰ However, there have been concerns about the involvement of medical practitioners in the interrogation and, arguably, torture of detainees in various settings. A report entitled "Preventing torture: the role of physicians and their professional organisations: principles and practice" has documented examples of such participation in torture, in the form of "the provision of medical knowledge to interrogators, disregard of medical confidentiality, force-feeding of rational people on hunger strike, and falsification of medical records or death certificates".¹²¹ In a 2011 article, Hall pointed out that the 1997 World Medical Association Statement on the Licensing of Physicians Fleeing Prosecution for Serious Criminal Offences "states uncompromisingly that a physician who perpetrates torture, war crimes, or crimes against humanity is unfit to practise medicine".¹²²

Lastly, mention needs to be made of the use of section 100 of the Constitution by the Executive to intervene in the administration of a provincial DoH (in this case, Limpopo). Section 100 states that "[w]hen a province cannot or does not fulfil an executive obligation in terms of the Constitution or legislation, the national executive may intervene by taking any appropriate steps to ensure fulfilment of that obligation, including –

- a) issuing a directive to the provincial executive, describing the extent of the failure to fulfil its obligations and stating any steps required to meet its obligations; and
- b) assuming responsibility for the relevant obligation in that province to the extent necessary to –
 - i) maintain essential national standards or meet established minimum standards for the rendering of a service;
 - ii) maintain economic unity;
 - iii) maintain national security; or

- iv) prevent that province from taking unreasonable action that is prejudicial to the interests of another province or to the country as a whole”.

This option is never exercised lightly. Its use in relation to a provincial DoH reflects the seriousness with which health is regarded, and the extent to which the state is bound to ensure the progressive realisation of the rights enshrined in section 27 of the Constitution.

Conclusion

Although no health-related Bills had been passed by Parliament in 2011/2012 at the time of writing, intense interest existed in the way in which the National Health Amendment Bill (Bill 24 of 2011) is evolving. Intense interest has also been expressed in at least some of the secondary legislation produced in the period under review. The Tobacco Regulations in particular promise to be highly controversial, even though entirely justified. Progress has been made in bringing further provisions of the National Health Act into effect, but some critical elements remain unresolved. Nonetheless, all these developments will pale into insignificance as soon as the White Paper on NHI is issued.

An element that has not, as yet, enjoyed any attention is the cost associated with developing health-related legislation. A 2012 costing study of New Zealand legislation showed that an Act of Parliament cost the central government US\$ 2.6 million, and a Regulation cost US\$ 382 000.¹²³ The authors suggested that “such costs be included in economic evaluations of public health interventions that involve new legislation”. Such an approach would also focus attention on the costs of poorly drafted or conceptualised legislation and on the extensive resources that are expended in the process. The New Zealand study used a central government perspective, which ignores costs borne by actors outside of government. Including such costs, in a societal perspective, would be expected to raise the estimate even further. While essential to the effective development of policy, none of the processes outlined in this chapter are free of costs, to a wide range of actors. They deserve careful scrutiny and handling.

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National Health Insurance: The first 18 months

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South Africa is poised at the brink of effecting significant and much needed change to its health system; a change based on the principles of social solidarity, equity and fairness. A National Health Insurance (NHI) is the vehicle which is intended to bring about this change and is expected to have a lasting and recurring impact on the health of all South Africans. The policy objective of NHI is to ensure that everyone has access to appropriate, efficient and quality health services. Intended to be phased in over a period of 14 years, such a system will require significant overhaul of existing service delivery structures, administrative and management systems.

This chapter summarises the progress and future plans for introducing the NHI in South Africa. Since the NHI Green Paper was launched in August 2011 there has been considerable progress in preparing the final NHI policy and in preparing South Africa's health system for the introduction of NHI. This chapter summarises progress against the key features of the NHI's development as outlined in the Green Paper and includes input on key areas and initiatives that have been identified for the successful implementation of NHI. This includes, amongst others, management reforms, hospital reimbursement reforms, establishment of the Office for Health Standards Compliance, undertaking of the national health facility audit, quality improvement and certification, and strengthening of district health authorities.

Many challenges and risks exist but plans to mitigate these are being put in place; in particular, to continue the process of consultation, improving on communications (including the timetable for changes to happen), strengthening oversight of the reform process in existing and future pilot districts and keeping a focus on equity to ensure that introducing the NHI will lead to a fairer healthcare system.

The policy objective of NHI is to ensure that everyone has access to appropriate, efficient and quality health services.

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Introduction

This chapter provides a brief summary of the progress made in preparing for the NHI since the launch of the Green Paper in August 2011.¹ It also comments on some of the key challenges to be overcome in implementing the NHI and discusses the way forward.

The 2010 edition of the *South African Health Review* (SAHR) provided extensive information on a proposed NHI for South Africa (SA) from a variety of perspectives,² while the 2011 edition³ provided an overview of the key issues contained in the Green Paper.

The principles that provide the basis for developing the NHI were made clear in the Green Paper. The NHI will improve access to quality healthcare services and provide financial risk protection against health-related catastrophic expenditure for the whole population. Such a system will provide a mechanism for improving cross-subsidisation, according to which funding contributions would be linked to an individual's ability to pay and benefits from health services would be in line with an individual's needs. Everyone will have access to a comprehensive package of healthcare services, provided through accredited and contracted public and private providers, with a strong focus on health promotion and prevention services at the community and household level. There will be clear lines of accountability at all levels of the health service and transparency of decision making. The NHI's objectives are:

- to improve access to quality health services for all South Africans, irrespective of whether they are employed or not;
- to pool risks and funds so that equity and social solidarity will be achieved through the creation of a single NHI fund;
- to procure services on behalf of the entire population and efficiently mobilise and control key financial resources; and
- to strengthen the under-resourced and strained public sector in order to improve the health system's performance.

Progress

The first five years of NHI development will aim at strengthening the public sector in preparation for new NHI systems, with the launch of the new central NHI fund envisaged in 2014/15. In the Green Paper a timetable was set for the development of the NHI. We review progress here against that plan of action.

NHI White Paper and legislative process

Following the launch of the Green Paper, the National Department of Health (NDoH) had several consultations with medical scheme administrators, labour, the pharmaceutical industry, professional associations for different occupations, statutory bodies, government departments, academia, civil society and parliament. Over 100 submissions were made to the NDoH. In December 2011 an international conference was held, with experts from a number of countries and institutions around the world sharing their experience of introducing NHI-like arrangements and moving to universal health coverage.⁴ The Minister of Health's 'road-show' to each of the NHI districts involved meeting a wide range of stakeholders, including: independent doctors, mayors and councillors responsible for health, religious leaders, traditional leaders, managers of health

facilities, health workers and their unions, and principals and school governing bodies. All 11 pilot districts were included, which involved a total of over 15 300 stakeholders. The knowledge gained from the consultations will contribute towards the development of Government's White Paper on National Health Insurance in consultation with the Treasury.

Experience from other countries has shown the importance of positioning health reform within a legal framework.⁵ Other legislative changes will be required for health service tariffs. Countries that have successfully introduced universal coverage have well established mechanisms for pooling funding that address equity, efficiency, and sustainability of health expenditure.⁶ The White Paper is expected to be launched in 2013, after which there will be further consultations and completion of a final NHI Policy Document. At this point the NHI legislative processes will commence.

Management reforms and designation of hospitals

- **Publication of regulations on designation of hospitals:** Regulations on designations of hospitals and policy on management were released for public comment on 2 March 2012.⁷ They provided clarity on the categorisation of hospitals into districts (small, medium and large), regional, tertiary, central and special (e.g. psychiatric) and the services that should be provided within each. This has allowed for chief executive officer (CEO) job descriptions to be more clearly defined – a key step in ensuring the appointment of competent and skilled managers, the decentralisation of management and the development of accountability frameworks.
- **Policy on the management of hospitals:** The separation of purchaser and provider functions is of particular importance for the management of hospitals. These complex institutions need highly skilled, empowered senior managers to ensure efficiency and the provision of quality services. The NDoH has prepared draft guidance for strengthening all hospital boards in the public sector. In addition, the NDoH is aiming at stronger oversight and greater accountability of central hospitals. Work has started with three central hospitals in Gauteng (Charlotte Maxeke, George Mukhari, and Steve Biko). These hospitals render highly specialised tertiary and quaternary service on a national basis and are a platform for the training of health workers and research. They also function as referral units for the other hospitals and employ highly trained staff. Initial work has focused on revenue generation, collection and retention as a first step in strengthening their information and administration systems.
- **Advertisement and appointment of health facility managers:** Following the assessment of competencies of all public sector CEOs, the filling of 86% (102) of the 118 new CEO positions has been completed. In future, all senior managers will need to undergo specialist training and be accredited by a newly established South African Leadership and Management Academy.

Hospital reimbursement reform

Regulations are in place to allow hospitals to raise revenue from the clinical and other services they provide to those who have access to other sources of financial protection. The 2009 Uniform Patient Fee Schedule (UPFS) was developed to provide a simpler charging mechanism for public sector hospitals.⁸ Various initiatives are progressing and are described below.

- **Central hospitals:** To prepare hospitals for the future NHI the World Bank is assisting the NDoH with a project to improve administration and management capacity in three of the central hospitals in Gauteng. The project focuses on: upgrading information technology infrastructure; improving financial management; and identification and implementation of efficiency savings in work-flow processes using short-term placement of interns to prepare for new financing mechanisms. Information Technology (IT) 'rescue-plans' have been developed for the three hospitals. A case study on the financial management processes in Charlotte Maxeke has been written, which covers new models of financial management under the NHI. The work has also identified an additional R37 million over five months from users covered by medical schemes.
- **Other sources of income:** The revenue derived from patient fees is a consistent funding stream to augment current operational budgets. Revenue enhancement strategies aim at improving revenue collection, resource management and administration, with a financial incentive to retain surplus revenue generated. Revenue collected by provinces is directed into the provincial revenue fund, which is incorporated into the annual budget allocation. The revenue performance for the two past fiscal years was R842 million in 2010/11 and R671 million in 2012/13 (up to third quarter) totalling approximately R1.5 billion. Details are as follows:
 - **Road Accident Fund (RAF):** The potential to improve revenue collection from the RAF is considerable. The NDoH was previously hampered by limited liability for certain road accident victims, but since the change in legislation in 2003 the NDoH has displayed a positive revenue growth. Challenges still persist in respect to the onerous processes of lodging claims against the Fund. The NDoH collected a total of R630 million in 2010/11 and 2011/12 (up to the third quarter);
 - **Medical schemes:** Raising funds from medical schemes has proven to be difficult, as medical scheme rules create barriers to effectively collect revenue due to the application of prescribed minimum benefits. The NDoH has collected a total of over R408 million for this period. More work is now required on reimbursement reforms to raise revenue from medical schemes.
 - **Intergovernmental organs:** The public sector also raises funds from providing services to other state organs. The total income generated was R299 million.
 - **Subsidised patients:^a** The NDoH statutory obligation is to decrease or eradicate any user fees raised against the patients who should be subsidised patients. Currently, this

^a "Subsidised patients" are those who do not fall in the category of full paying patients (as per the national UPFS guidance). Subsidised patients are also categorised on their ability to pay for health services: H0 (fully subsidised); H1 and H2 (partially subsidised).

obligation cannot be fulfilled because of a lack of patient identification systems. The income generated from those without medical scheme cover (including those who should be subsidised) equates to R175 million over this period.

- **Coding systems:** The implementation of the NHI will also require a comprehensive health service coding for hospitals and other health establishments and work required in this area is being mapped out.
 - **Diagnostic coding:** An ICD-10 coding system exists in South Africa⁹ (SA) but is not yet operating satisfactorily in all public health institutions whereas the private sector uses it for billing purposes. The Minister of Health has appointed a task team to advise on necessary changes that must be considered in SA and to keep pace with changes that are implemented internationally. The task team has sub-groups working on morbidity, mortality, privacy and confidentiality, and communications and monitoring. A key priority for 2013 is training and improving the skills of those involved in coding.
 - **Procedural and other coding:** There is no standardised National Procedural Coding System available in SA, which leads to fragmented procedural coding systems. To compound this problem, the Intellectual Property (IP) of these different procedural coding schemas is in the hands of private organisations. It is important, therefore, that a process of developing all these different coding schemas into a preferred standardised national coding system commence as soon as possible. Such a schema will ensure that government is able to do version controls and updates without seeking permission from IP holders. When a preferred schema is identified, it will be customised to suit the South African health sector environment. A case-based hospital payment system (based on Diagnostic Related Groups^b) is being piloted in several hospitals including: Umtata (Eastern Cape), Universitas (Free State), Inkosi Albert Luthuli (KwaZulu-Natal), and Steve Biko (Gauteng). Other coding systems that will be required include unique provider numbers, facility numbers, specialty codes, and a laboratory-results coding system. These codes will need to be contained collectively in some form of 'National Health Data Dictionary', as in other countries.¹⁰

Establishment of the Office for Health Standards Compliance

The National Assembly will shortly vote on the final version of the National Health Amendment Bill required for the Office for Health Standards Compliance (OHSC) to be established in 2013 following promulgation by the President.¹¹ The objectives of the Office are to protect and promote the health and safety of users of health services by (a) monitoring compliance by health establishments with norms and standards prescribed by the Minister in relation to the national health system; and (b) ensuring consideration, investigation and disposal of complaints relating to non-compliance with prescribed norms and standards in a procedurally fair, economical and expeditious manner. It will have three sections. The first will be an inspection unit that will arrive unannounced to check and report

^b Diagnostic Related Groups: A patient classification scheme that provides a means of relating the number and types of patients treated in a hospital to the resources required by the hospital, as represented by a code.

on compliance, with problematic hospitals having frequent visits, and others less frequent. The second will be an ombudsperson to whom dissatisfied members of the public can complain. Finally a certification unit will certify every health establishment that meets the required standard or withdraw certification as part of a set of progressive sanctions. Improvement in the quality of services through ensuring compliance with standards will remain the responsibility of health service providers.

Public health facility audit, quality improvement and certification

- **Audit of health facilities:** An audit of all 3 880 public sector facilities has now been completed. This covered all public health facilities (including clinics, community health centres and district, regional, specialised and tertiary hospitals) in all nine provinces and used standardised measurement tools.¹² The assessment included the range of health services provided, the profile of each facility, the state of the physical infrastructure, the availability and basic functionality of medical equipment, the degree of compliance with national quality standards, the allocation and availability of human resources, the status and utilisation of Health Information Systems, the utilisation rates of healthcare services and facilities and the budget and expenditure reports for the health facilities.
- **Facility improvement teams (FITs):** These teams have been established, trained in quality improvement¹³ and started in the NHI pilot districts, to strengthen the supervision of services and help ensure that the many problems identified in the audit are systematically addressed. Approximately 1 000 facilities have been covered. There is a need now to systematically scale up the initiative, whilst evaluating and learning from the current experiences and successes, as shown in Boxes 1 and 2. Some problems are more systemic and require longer-term strategies to improve leadership and culture.

Box 1: Facility Improvement Team (FIT): Sedibeng – reducing waiting times

The overall methodology of FITs is to focus on the worst performing facilities according to data obtained in the national audit and use the best performing facilities as local benchmarks for comparison.

Discussions with staff covered the six priority areas – availability of medicines, cleanliness, patient safety, infection prevention and control, positive and caring attitudes and waiting times. The last area was a particular concern in the district.

Sub-district 'FITs' were formed, led by sub-district managers, and the problem of waiting times assessed using root cause analysis, and process maps to identify bottlenecks. (see Figure 1)

Problems were categorised into those that could be sorted out immediately and those that had to be taken up with provincial authorities, such as that many of the facility managers were acting and critical staff vacancies existed.

'Quick win' improvements were then designed to improve waiting times. (See Figure 2) These included re-organising the waiting area, arranging triage by a professional nurse and having fast queues for emergencies, children, family planning and pregnant women. Other 'best practices' identified included a booking system for chronic diseases, and vital signs, laboratory tests and dispensing done by the primary health nurse in each consulting room. Regular reviews were done by 'quality circles' where teams discuss performance on a daily basis.

Box 2: Facility Improvement Team (FIT): Pixley Ka Seme – community participation and partnership

The FIT took the following innovative approach to their work. They constituted teams consisting of a national, provincial and district member for each sub-district. By the end of July 2012, a facility improvement plan was developed for each facility in the district. This gives every facility certain targets at certain times to achieve. Meetings were held with Mayors and role players in all the sub-districts. As a result a stakeholder forum for each sub-district was established. Community dialogues on health issues were started in one sub-district. The stakeholder forums, led by the Mayors, meet monthly to assess progress attained in addressing challenges and assess individual facility performance in respect to performance in the six quality priority areas and other health service delivery matters. Facilities then had to report monthly on progress made. For each of the sub-districts there has been substantive progress. Despite the major problem of insufficient staff, many quick wins were identified and resolved with the help of the community.

- **Inspection of facilities:** The work of the OHSC has already started, with inspectors recruited and trained to carry out inspections of public facilities on a voluntary basis. By end January 2013, 171 establishments had been inspected against the national standards and the results discussed with facility managers, with a further 80 inspections planned by end March 2013. These are "mock" or training inspections at present, with both the tools and the procedures being progressively refined, and the norms to be prescribed still being developed. They have thus far covered every province and all types of hospitals and primary care establishments, although the numbers are still small and should be interpreted with caution. Initial results show that central hospitals (as would be expected) are closest to the probable future compliance threshold of 80%, although with a range between 59% and 92% in the overall scores, and even the top-performing hospitals presenting with areas requiring improvement. District hospitals, community health centres and clinics have been further from the desired threshold, with a significant proportion scoring below 50% overall (with some as low as 24%) though with some excellent establishments in this same group scoring over 90%. Re-inspection visits to review whether corrective action has resulted in an improvement will be initiated from April 2013, focusing on the highest-risk and lowest-scoring establishments. Direct feedback and validation has been built into the routine of each inspection, for each individual unit and for the establishment as a whole. This is used to convey the intent of the standard being assessed and the gaps found in a process that is acknowledged by establishments as contributing to their knowledge and understanding. Once the OHSC becomes properly established, inspections will be mandatory, in both the public and private sectors. Great effort has therefore been put into an extensive communication process. Since late 2011, national meetings on this matter in every province have been followed by extensive dissemination throughout the health services. This effort is currently being reinforced, with a focus on effective ways of reaching frontline staff and using recognised quality improvement methods to close identified gaps.
- **Inspection of NHI districts:** The Inspectorate has started inspections in 8 of the NHI pilot districts and will be increasing the coverage in the coming months to reach 15% coverage of establishments. The overall audit scores vary per district and also per type of establishment, with hospitals generally scoring higher than clinics in the same district. The inspections

Figure 1: Process map to identify bottlenecks, developed by Sedibeng Facility Improvement Team

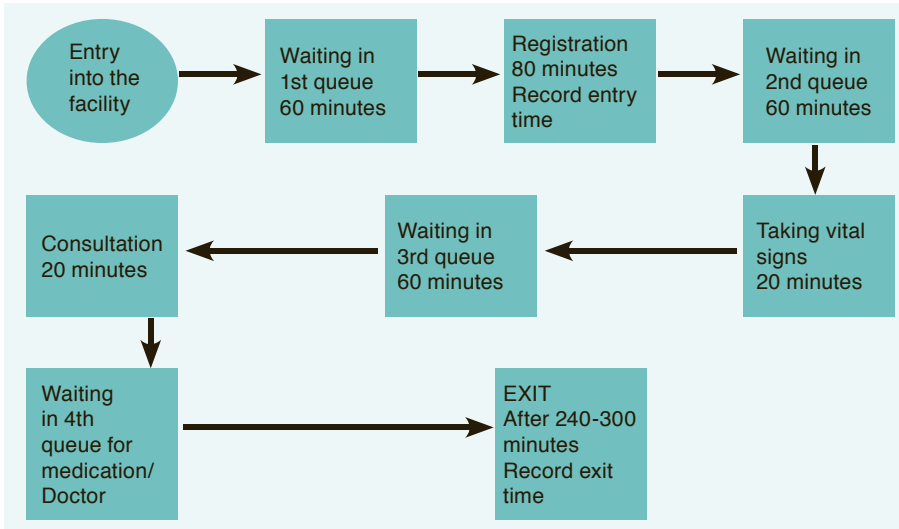
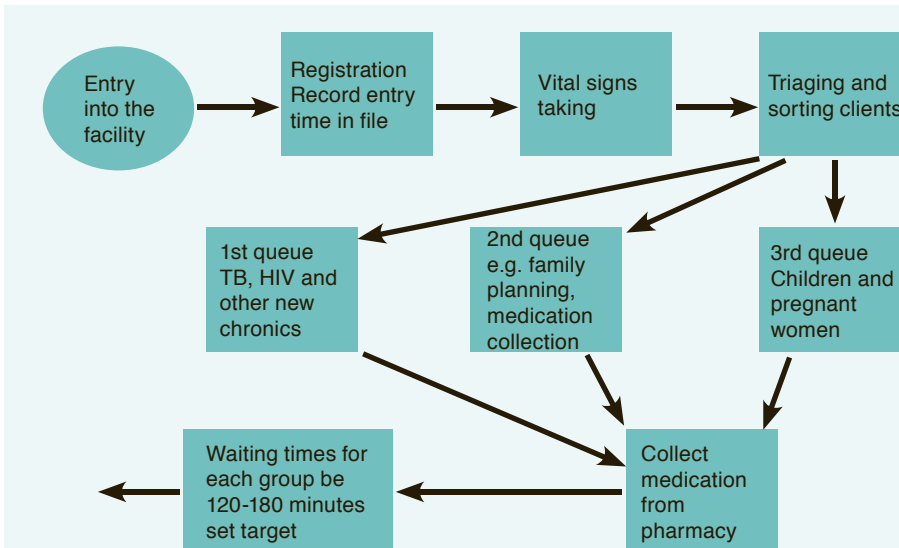


Figure 2: Planning to reduce waiting times, Sedibeng Facility Improvement Team



have included an assessment of four NHI pilot district offices as they are involved in critical components of the delivery of quality care, although they are not strictly “health establishments”. These offices (or even provincial offices in some cases) implement a number of support services such as human resources (HR), finance, procurement or infrastructure. District offices should play a key role in providing leadership, oversight and support in relation to compliance with the core standards in all establishments for which they are responsible. The district offices that were inspected, however, found this to be a new concept and something they are not well-prepared to do, scoring low in assessments.

Primary health care re-engineering

If SA is to provide access to quality health services for all its population, experience from other parts of the world shows that effective primary health care (PHC), with a focus on prevention and health promotion, must be at the centre of service delivery.¹⁴⁻¹⁵ Services need to be based within all communities to promote good health and prevent ill health and act as the first point of contact for most health care.¹⁶ This will provide some balance to the current dominance of hospital-centred curative care.¹⁷ The PHC platform in SA is being established across the country based as three complementary components, referred to as streams.¹⁸

➤ **District Clinic Specialist Teams (DCSTs):** These newly established teams will focus on improving both the quality of health care and health outcomes for mothers, newborns and children.¹⁹ As of December 2012, over 43% of positions have been filled, with a target for every district to have a dedicated senior obstetrician and gynaecologist, paediatrician, family physician, midwife, paediatric and PHC nurse. Their induction and orientation programme is now underway with five modules to be completed over one year:

- status of maternal child health in SA and the national vision for the DCST and PHC;
- team building, role clarification and tools for conducting baselines;
- clinical orientation; leadership, mentoring and coaching; and
- outreach support.

The induction programme is well underway in KwaZulu-Natal, Gauteng, Limpopo, North West and the Free State, with a schedule having been agreed upon for all the remaining provinces.

➤ **Municipal ward-based primary health care:** Evidence from many countries suggests that provision of home- and community-based health services and their links with fixed PHC facilities in particular are critical to attaining good health outcomes, especially child health outcomes. Literature has shown that the role of community health workers (CHWs) in many countries has contributed to better health outcomes.²⁰ Each municipal ward in SA will have one or more PHC outreach teams. These teams are composed of a professional nurse, environmental health and health promotion practitioners, as well as CHWs. The main functions of these teams is to promote good health and prevent ill health through a variety of interventions based on the concept of a healthy community, a healthy family, a

healthy individual and a healthy environment. Approximately 25% of the 40 000 CHWs have been re-trained in the new, national approach to community-orientated PHC. While this brings many challenges, and may take some time to implement fully, the CHW will be at the centre of the future PHC system and the contact point for all households.

➤ **School-based PHC services:** The new national Integrated School Health Policy was launched with the Departments of Basic Education and Social Development in October 2012.²¹ A database of school nurses has been established by the NDoH. The policy focuses on the most disadvantaged schools in the country. School nurses will be supported by mobile clinics to provide preventative and promotive services, reduce health barriers to learning, and facilitate access to health and other services where required. In 2012 an additional 30 mobile clinics were deployed and a further 60 are currently being purchased by the NDoH. The package of services includes:

- *Health education and promotion* – including: nutrition and exercise; personal and environmental hygiene; chronic illnesses (including HIV and TB); abuse (sexual, physical and emotional abuse, including bullying and violence); sexual and reproductive health; menstruation; contraception; sexually transmitted infections (STIs) including HIV and AIDS; male circumcision including male medical circumcision (MMC); teenage pregnancy; choice of termination of pregnancy (CTOP); prevention of mother-to-child transmission (PMTCT) of HIV; HIV counselling and testing (HCT) and stigma mitigation; and mental health issues including drug and substance abuse, depression, anxiety and suicide.
- *Learner assessment and screening* – including: conducting vision, speech and basic hearing screening; measurement of height, weight and calculation of body mass index (BMI) linked to appropriate nutritional interventions; checking for fine and gross locomotor problems; conducting oral health screening; screening for chronic illness or long-term health conditions, including both communicable diseases, (such as TB and HIV and AIDS) as well as non-communicable diseases; and performing a basic mental health and/or psychosocial risk assessment.

Public hospital infrastructure and equipment

Work is underway to enable provinces to plan, manage, modernise, rationalise and transform infrastructure.

➤ **Refurbishment and equipping nursing colleges:** To date over 70 nursing colleges and schools are being refurbished as shown in Table 1.

Table 1: Refurbishment of nursing colleges, 2012

Province	Number of nursing colleges refurbished
Eastern Cape	11
Free State	4
Gauteng	15
KwaZulu-Natal	12
Limpopo	6
Mpumalanga	4
Northern Cape	1
North West	8
Western Cape	11

- **Refurbishment of public sector facilities:** The NDoH is now following up with provinces for them to respond to the issues identified in the facilities audit. This includes:
 - expanding on existing facilities where there are problems with space, but where there is room for expansion;
 - fixing and repairing problems that were identified in the audit, such as dilapidated facilities;
 - building new infrastructure where long-term solutions are required; and
 - where there are acute problems of access, supplying services through mobile or prefabricated facilities.
- **Building of flagship hospitals and medical facilities through public-private partnerships (PPPs):** Major infrastructure projects are also underway in the tertiary centres. Feasibility studies are at an advanced stage in five centres: Polokwane Academic Hospital (Limpopo), Chris Hani Baragwanath Academic Hospital (Gauteng), Dr George Mukhari Hospital (Gauteng), Nelson Mandela Academic Hospital (Eastern Cape), and King Edward VIII Hospital (KwaZulu-Natal). The pre-qualification of six international and national competitors has been completed for the bidding for the design work.

Human Resources for Health

- **National Human Resources for Health Strategy:** The strategy was launched in October 2011.²² Work has started on the determination of norms and staffing needs for the country for primary and secondary care. This is being done with support from the World Health Organization (WHO) using the Workload Indicators of Staffing Needs (WISN)²³ method with the aim of improving the HR data extraction, capture and analysis. This will ensure the appropriate level and mix of staff at facilities. Six provinces have been trained in WISN and it will be used within all 11 NHI pilot districts to estimate and cost future staff requirements. The challenge posed by the various professional categorisations is being resolved following the completion of the review of the Occupational Specific Dispensation. The report has been completed and its recommendations are now being implemented.
- **Leadership and Management Academy:** As envisaged in the human resources for health (HRH) strategy, the Leadership and Management Academy was launched in October 2012.²⁴ Its vision is to be a centre of excellence and a beacon of good practice in health leadership and management. Its aims are to develop outstanding leadership and management in health in order to improve people's health and their experience of the

NHI. It will create an industry-wide benchmark of accredited programmes for all levels of leaders and managers, commissioning programmes necessary to meet identified needs and identifying, developing and promoting best practice. The academy recognises that good leadership and management are about improving health equity and outcomes, committing to professionalism, championing equality and diversity, and encouraging innovation and continuous improvement. The committee's first task was to prepare an induction and orientation programme for the newly recruited CEOs, which took place over five days in early February 2013 for 88 of the 102 newly appointed CEOs. Various national and international experts are now working together to inspire and encourage this new group of leaders to respond to their needs and concerns and to facilitate sharing of experiences and best practices through teamwork and support. A longer-term programme of support and development will be based on the individual needs of CEOs.

- **Increase in production of doctors:** Training of new doctors has been increased through increasing the intake in training institutions and sending 1 000 medical students to Cuba to be trained. Since the launch of the strategy, an extra 40 doctors started training in SA in 2011/12 and 125 in 2012/13. Also, 95 medical specialists are being recruited from Cuba and will start work in SA in 2013. In addition, the number of professionals undertaking community service is steadily increasing, with 7 162 placements across all provinces in 2012, covering doctors, dentists, pharmacists, and other specialties.
- **Increase in production of nurses:** In October 2011, the Minister of Health appointed a task team on Nurse Education and Training to take forward the recommendations from the April 2011 Nursing Summit. This has resulted in a National Strategic Plan²⁵ being completed in February 2013. Nursing colleges will be declared higher education institutions in compliance with the provisions of the Higher Education Act (as amended in 2008). Nurse Education and Training is to be regarded as a national competence accounting to the Director-General of Health to help address current provincial inequalities, decrease fragmentation and improve national clinical training and accountability. The South African Nursing Council (SANC) will be requested to develop and finalise an accreditation framework for Nursing Education Institutions. The task team also recommended that nursing students be awarded the status of full student (rather than employee) while undergoing their training and that clinical education and training be strengthened. A Continuing Professional Development (CPD) system for all nurses and midwives, linked to licensing and professional progression, will be introduced and include professionalism and ethics as a compulsory component. Provision of a uniform allowance will be phased out and will be replaced with the direct provision of contemporary white uniforms provided by employers. An office of the Chief Nursing Officer (CNO) is to be established and will facilitate the development and implementation of the national core curriculum for nursing and also a national framework for financing nurse education and clinical training to overcome current inefficiencies and inequities. These actions will help bring clear leadership and management nursing structures

at all levels of government health services. The standards for the Positive Practice Environment (PPE) are in the national core standards, and will be extended to cover other recommendations in the MTT report. National nursing norms will be finalised to strike a balance between ideal staffing, what is a safe and what is affordable using a combination of the WHO's population-based norms and an activity based workload approach in SA.

Information management and systems support

An effective NHI is reliant on an effective set of information systems that helps health workers and facility managers keep track of the services and the quality of care provided, and for the contracts between purchasers and providers to be properly monitored. Considerable efforts are required to improve the quality, coverage and standardisation of information across the public and private healthcare systems. While much still needs to be done, progress has been made in some critically important areas such as the e-Health strategy (see below) which was officially launched in 2012 and an agreement on national indicators and targets for the priority areas in the NSDA for health,²⁶ through the work of the Health Data Advisory and Coordination Committee.²⁷ Norms and standards for national health and information systems have been developed in partnership with the CSIR. In addition a variety of initiatives designed to improve the health information system in the country have been undertaken. These include the following:

- **National Health Information Repository and Database (NHIRD):** The vision of NHIRD is to provide up-to-date information on routine National Indicator/Data Sets (NIDS) data and indicators and to provide a unified and integrated repository for data such as the annual HIV and syphilis survey, demographic and health surveys, child health and HIV counselling and testing campaigns, aggregated financial data from the basic accounting system (BAS) and municipal financial systems including District Health Expenditure Review (DHER) data, HR data from government (PERSAL) and municipal HR systems, and a range of data sets from other government departments (e.g. Statistics South Africa, Human Sciences Research Council, Medical Research Council) and national and international development partners. This national database is now established and also contains data from the audit of all public sector facilities. It also has information on service access and determinants of health (e.g. deprivation and household income) and is being made available to provinces. In the future it will be routinely available to districts and service providers.
- **Data capturers:** The District Health Management Information System (DHMIS) Policy approved in October 2011²⁸ stipulates different categories of Health Information Systems (HIS) personnel required at different levels of the health system, including data capturers responsible for capturing the data at all fixed facilities, sub-district or higher levels, and then forwarding the data to the next level. By the end of 2011/12, a total of 1 721 cadres had already been appointed, with an additional 550 employed by December 2012. These are young unemployed South Africans with at least a matriculation

certificate, who are recruited by the NDoH, and sent for training. During 2013/14, a total of 503 of these data capturers will continue to work in the public health sector on contracts and the NDoH aims to add 900 additional data capturers in 2013 to meet its target of 3 535.

- **Information Communication and Technology (ICT) graduates:** As part of the internship programme for young, unemployed South African graduates, 137 graduates with IT were employed. They have been provided with opportunities to gain work experience in the public health sector and will prove to be an invaluable asset for health information systems strengthening in SA in the near future.
- **Patient records:** Many innovations using both simple and complex electronic systems are being used across the country. This is an area that requires further work for both primary- and hospital-based care.

Strengthening of District Health Authorities

- **NHI district management and government structures:** One of the gaps in the health sector is building a strong cadre of executive leaders capable of managing the complex healthcare environment and leading the re-engineering of PHC and hospitals in the build-up to the NHI rollout. The South African Executive Leadership Programme in Health (SAELPH) is one initiative that will help to fill this transformation gap. It is a partnership involving the University of Pretoria (UP), the University of Fort Hare (UFH), the Harvard School of Public Health and others in collaboration with the NDoH. Since its start in 2012 it has engaged 60 district managers in its programme on "Transformation of Health Districts" and a further 30 on "Leadership in Health Districts". It also holds policy seminars and round table meetings, including ones on NHI and pilot districts that enable district managers to engage with national and international experts and policy makers.²⁹ Preparatory work to develop District Health Authorities is a priority for 2013 and this is now underway.
- **NHI pilot districts:** In April 2012 the first wave of 11 pilot districts were announced. The districts are situated in every province and specifically in areas with high levels of under-served communities. (See Table 2) The specific aims of the district pilots are to:
 - assess the ability of districts to assume greater responsibility with a 'purchaser-provider split';
 - assess the feasibility, acceptability, effectiveness and affordability of engaging the private sector; and
 - assess the costs of introducing a fully fledged District Health Authority and implications for scaling-up.

District NHI Business Plans provide an opportunity for 'bottom-up' learning and experience to inform central NHI-related policy and the rollout of reforms to other districts.³⁰

Table 2: NHI pilot districts

District (Population, 2012)	Province
OR Tambo (1 754 499)	Eastern Cape
Thabo Mofutsanyane (771 610)	Free State
City of Tshwane (2 520 435)	Gauteng
Amajuba (517 279)	KwaZulu-Natal
uMgungundlovu (1 071 606)	KwaZulu-Natal
Umzinyathi (517 806)	KwaZulu-Natal
Vhembe (1 312 197)	Limpopo
Gert Sibande (946 719)	Mpumalanga
Pixley ka Seme (192 572)	Northern Cape
Dr Kenneth Kaunda (905 675)	North West
Eden (567 993)	Western Cape

Some additional funds have been made available through a conditional grant to catalyse initiatives to strengthen the district health system, to improve access to quality health services, to look for efficiencies, to improve health system performance, and to improve management of services. Links between the pilot districts and academic groups specialising in health systems and public health research are being encouraged to provide some rigour to the learning process. This work will inform national debate on the options and costs for establishing stronger management and accountability mechanisms at the district level through establishing District Health Authorities. Implementation will require considerable efforts to strengthen the capacity of existing district management teams and their oversight mechanisms in areas such as financial management, planning, monitoring, evaluation and contracting.

- **The service package to be offered under the NHI pilot sites:** International experience on defining a package of services to be made available under the NHI has been carefully reviewed, and a starting point for SA is the Minister's agreement of a 'non-negotiable' set of services to be universally available.³¹ The NDoH is now overseeing work to ensure that all these are adequately budgeted and provided for as part of the national and provincial support to districts.

NHI Conditional Grant

The NDoH has made available R150 million to develop new systems and capacities in pilot districts and central hospitals, provided through a new conditional grant as mentioned above. These grants will fund the implementation of 'NHI business plans' in all of the 11 pilot districts and average R11.5 million in each district.³⁰ The main purpose is to pilot and test new interventions required for the successful implementation of NHI so that those that are shown to work can be rolled out more widely. They will see a scale up of activities in 2013/14 including R300 million from the grant, and R450 million in 2014/15.³² These grants include R5 million to strengthen revenue collection and related systems and test innovations around revenue retention and management in central hospitals.

Costing

Background work on two costing models was done prior to the release of the Green Paper. One was a costing model based on work by McLeod et. al.³³ who explored a range of alternative assumptions about the scope and efficiency of health service delivery. Using data from existing medical schemes with different

kinds of benefit combinations, they estimated fully comprehensive benefits to cost R234 billion. However, costs varied hugely depending on the comprehensiveness of benefits included and the service delivery efficiency assumed, ranging from R78 billion to R334 billion. The Actuarial Society of South Africa (ASSA)³⁴ also developed a comprehensive costing model drawing on medical scheme data. They estimated that a comprehensive package, with efficiency savings, would cost R235 billion, similar to the previous model, but that it could be as high as R336 billion for NHI at full implementation in 2025/26, if modelled on the current private sector. The Treasury and the NDoH have now taken forward more detailed costing work.

- **Costing based on NHI Pilot Districts:** The NDoH has commissioned a detailed costing exercise in the 11 NHI pilot districts to inform future planning. This will focus on the specific intervention requirements for each pilot district: including strengthening District (and sub-district) Management Teams and creation of District Health Authorities, comprehensive service benefits, strengthening health facilities, the three PHC streams, contracting private providers, emergency medical services, strengthened referral systems, and other preparatory activities related to specific district needs. The work is now underway and will be completed in the first half of 2013.
- **Green Paper model:** The resource requirements for NHI set out in the Green Paper were derived from a model built on projected utilisation trends by five year age-group and average-unit costs. A revised version of these projections has been prepared by the National Treasury, based on more recent estimates of the costs of the NHI pilots and other reforms currently being implemented. Implicit in this projection is a partial shift over time from medical scheme coverage to NHI, as NHI becomes fully functional and citizens gain trust in the system, and the broadening of NHI coverage to include purchasing of some private services. This transition cannot be adequately modelled yet, as it depends on the NHI benefit design and medical scheme regulatory reforms that are both complex and inter-related.
- **Determinants of healthcare costs:** There are broad similarities in the results of the costing models. However, a great deal of variation can be obtained by adopting alternative inputs and assumptions, providing insights into the future costs of NHI:
 - *Demographic projections:* Changes in the population structure and its epidemiological profile significantly affect changing health needs, including a likely shift in the burden of disease from communicable to non-communicable diseases.
 - *Health inflation:* Various factors tend to drive health sector costs above consumer price inflation – these include rising professional qualifications and remuneration levels, new technologies, new equipment and improved drugs.
 - *Utilisation changes:* Hospitalisation and primary care visit rates tend to rise as incomes and education levels rise, but there is considerable variation internationally. There is scope for shortening lengths of stay in hospitals through improved case management, appropriate self-care and alternative options for complementary or alternative private provision.

- *Benefit packages:* A critical set of policy choices concerns what should be included in the universal service package and what should be excluded and might be covered through top-up benefits or insurance options.
- *Unit costs of improved resourcing:* It is recognised that public services need to be better resourced to improve quality, but there is also scope for better use of existing resources through use of appropriate referral rules, diagnostic and therapeutic protocols and rationing some procedures.
- *Provider payment methods:* International experience shows us that the way in which hospitals and medical service providers are paid influences both volume and price of services delivered. Costs can be contained through volume-based global budgets and case-load payments for hospitals, and through bundled capitation payments rather than fee-for-service charges for general practitioners and other primary care providers. However, this brings considerable complexity into the negotiation and management of alternative reimbursement arrangements and it will take time to implement payment reforms.
- *Supply side constraints:* Service delivery expansion will be limited over the medium term by capacity limits, including the availability of doctors and professional nurses, and the time needed for improvements in health infrastructure.

➤ **Conclusions from costing work:** The design of an NHI system and the effective management of health financing reforms offer wide-ranging opportunities for containing costs and improving efficiency. A gradual and phased set of reforms is more favourable than a big-bang approach, with progressive re-evaluation as the country proceeds along the path to NHI.

Population registration

A partnership has been established with the Department of Science and Technology and consultations with the Council for Scientific and Industrial Research (CSIR) are underway on population enrolment for NHI and linkage to facilities. Considerable data is already available in the Department of Home Affairs (through identity documents) and public health facilities. A strategy for filling in gaps is being defined, which will then be piloted to learn lessons before agreeing a full acquisition strategy for a population register.³⁵

Information Communication Technology

The NDoH recently launched its e-Health strategy to harness information communication technologies to help transform the health system.³⁶ This strategy aims to resolve the problems of the past, clearly articulated in the NSDA 2010-2014:

Although large sums of money have been used to procure health ICT and Health Information Systems (HIS) in SA in the past, the ICT and HIS within the health system is not meeting the requirements to support the business processes of the health system thus rendering the healthcare system incapable of adequately producing data and information for management and for monitoring and evaluating the performance of the national health system. This results from the lack of technology regulations and a lack of policy frameworks for all aspects of infrastructure delivery.

The new strategy is based on a set of principles starting with getting the basics right (infrastructure, connectivity, basic ICT literacy, human resources and affordability planning). It proposes an incremental approach, building on what already exists and looking for early wins in implementations and benefits to build the confidence of health professionals, patients and the public. It aims to constantly evaluate and measure improvements in order to build an evidence base. National coordination will come through enabling integration between systems, enforcing common standards, norms and systems and establishing common data standards and terminology across information systems. A collaborative approach is required, which will leverage partnerships with the private sector, NGOs, other government departments, other country governments, and research organisations. Lessons globally show the importance of protecting information, confidentiality and patient privacy at all times and promoting information governance in order to use information better. Getting value for money is a key consideration, including consideration of available open source solutions. A key aim is to build the capacity and the systems to obtain official health statistics from a single official source and adhere to the established principles for national HIS information management. Another key principle is that the intellectual property ownership of public sector e-health initiatives should be vested in government.

Establishment of the NHI Fund

The pre-payment of all health services under the future NHI will be through a central fund, with its own management arrangements and governance mechanism. Work has now started on the different options for the roles, responsibilities and relationships of the future NHI funding body, building on considerable and well documented international experience.³⁷ Key to successful NHI implementation is the introduction of financial incentives to improve performance, create efficiency gains and control costs. The future “purchasing” and provider payment systems should be linked to service delivery and management improvements. As for the options for funding the NHI, the Treasury is completing its work for the future NHI including consideration of a payroll tax (payable by both employees and employers), a higher value-added tax rate or surcharge on taxable income, or some combination of these. A paper will be available for comment and consultation later in 2013. Also, under the NHI, national procurements will become increasingly important to gain from efficiencies of scale, and a national unit has been set up to manage this.

Accreditation and contracting private providers

Under the future NHI, there will be a clearer delineation of functions, between those responsible for purchasing of services, and those many providers, both public and private, that can provide them. It will be several years before this ‘purchaser-provider split’ will be fully operational, but opportunities are already arising for exploring these new relationships.

➤ **Contracting General Practitioner services:** From early 2013, the NDoH will start contracting approximately 600 private general practitioners (GPs) to provide services in the 11 pilot NHI districts. They will be located in facilities for communities that are currently under-served. The GPs will provide services that enhance the current PHC model including:

- health promotion and preventative care, focusing on non-communicable diseases, maternal child health, HIV and TB;
- personal curative services for patients referred by the PHC nurses, ward-based PHC agents and school health teams;
- ensuring effective chronic disease management based on a chronic disease patient record;
- support to antenatal and postnatal care services as determined by the clinical protocols; and
- clinical governance including training and capacity building of the PHC team.

Future phases of this work will focus on locating GPs in clinics where there is currently insufficient space by expanding infrastructure and options for licensing and accrediting existing GP practices under the NHI.

- **GP contract model:** A new national contract model has been developed in collaboration with national and international experts in this area. The national contract will allow for a basic rate as for now, with allowances for the experience of the GP, the amount of travel, working in rural areas, and additional incentives for working in very deprived areas. In addition there will be performance incentives both financial and non-financial such as for Continuing Professional Development. These performance agreements will be agreed locally with oversight from the family physicians in the DCSTs. Initially they will cover basic activity data and simple measures of quality, such as quality of case records, referrals and adherences to HIV, TB and maternal child health protocols as judged by a regular review of case records by members of the DCSTs. The initial agreement will include an upfront commitment to move to more sophisticated performance assessments in future years, focusing on areas such as risk assessments (e.g., smoking activity and alcohol consumption), and finally on outcomes (e.g. the percentage of diabetic patients with blood pressure values under 140/90). GP academic centres in KwaZulu-Natal, Gauteng and the Western Cape will provide the induction and orientation programme for newly contracted GPs, in line with current programmes being used for DCSTs.

Challenges, risks and their mitigation

Consultation and communication: As the quality of public sector services improves, more people and employers are expected to use these facilities. This will have implications for the sector as a whole, requiring further analysis and consultation. Similarly, continued consultation will be required with the various health professions to better understand the implications of more services being required from medical specialists, GPs, and other health professions. Whilst the preparatory work for NHI is now well established, there is still much to be debated. The publication of the NHI White Paper will provide an opportunity to discuss the vision of the NHI and its implications with a wide range of stakeholders. Within districts more emphasis must be placed on discussing the NHI with local communities to better understand local needs and to help ensure expectations are consistent with future NHI plans and timetables.

Harnessing cost-effective health technology: Breakthroughs in technology can improve outcomes and make the delivery of services more efficient, but can be a key driver in raising the cost of services.

A policy and institutional mechanism is required to assess the cost effectiveness of new health technology and make recommendations for inclusion or not in NHI-funded services. This will then need to be backed up by appropriate legislation. Collaborations in this area are being explored with other countries, such as with the United Kingdom's National Institute for Health and Clinical Excellence.

Making change happen: As with all major public sector reforms, changing the way districts and central hospitals function in the pilots will be difficult at first. The district work will now be overseen by senior Facility Improvement Project Managers in each province, reporting directly to the Head of Provinces and the NDoH. Once these project managers are all in place, implementation of the NHI business plans in each district should become easier, with more coherent and continuous oversight and supervision.

Building up our knowledge on what works: The experience of other major health sector reforms, such as in China and Mexico, have shown the importance of embedding evaluation, monitoring and assessment into the reform process. The slogan 'experimentation, evaluation, expansion' has been used by the current Minister of Health of China to summarise their approach to reform, which is happening on a large scale and parallels many of the challenges faced in SA.³⁸ Learning from experience is critically important using the milestones from countries that have successfully reached Universal Health Coverage such as Brazil and Thailand and also form the monitoring, evaluation and operational research of the South African NHI pilot sites.

Retaining the focus on equity: Experience in many other countries shows that health reforms often do not benefit those for whom they are intended.³⁹ A continued effort will be required to ensure that those who are currently under-served, such as in informal settlements and deep rural areas, get specific attention.

Way forward

SA is building a better understanding of what NHI is and why it must be implemented. There will likely remain many who question the policy for good and bad reasons, so continued consultation and dialogue by all players in society will be essential. The NDoH has agreed on a timetable for implementing the NHI, which is ambitious by international standards, but definitely possible. This review has shown that there has been good progress in many areas but in others there is still considerable work to be done. It will take time for these major changes in the financing and delivery of services to impact on people's lives. Expectations of what will happen and when need to be carefully managed. As SA prepares to launch the White Paper on the introduction of the NHI, we are confident that we are on the right track. Universal coverage is no longer a dream for SA and if all players work together it will become an increasing certainty.

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Service Delivery

Service Delivery



HIV Treatment in South Africa: The challenges of an increasingly successful antiretroviral programme

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South Africa has both the most people with HIV in the world and the largest antiretroviral treatment (ART) programme. The programme, now almost a decade old, has been influenced by the complex political responses to the epidemic in the country.

The programme is now internationally recognised as successful despite a slow start, and is responsible for recent dramatic improvements in South African life expectancy. However, the scale and cost of the programme have presented many challenges to the healthcare system and to funders. In addition, evolving HIV treatment guidelines constantly challenge healthcare delivery services, even while promising new data suggest that escalating treatment may be the most effective mechanism for preventing new infections.

This chapter examines the political, policy, programmatic and other issues surrounding the initiation and expansion of the ART programme.

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Introduction

The scale of the South African HIV epidemic remains huge. More HIV-positive people live in South Africa (SA) than in any other country. This is despite the fact that the country's population is small when measured against those of China, India and the United States of America (USA), all of which acknowledge their HIV epidemics as significant public health issues.¹⁻³ In population size SA dwarfs its neighbours. Combined with a very high prevalence, this means that there are more people with HIV inside its borders than all its immediate neighbours (Botswana, Lesotho, Mozambique, Namibia, Swaziland, Zimbabwe) combined, despite these countries having similar HIV prevalence rates.^{1,4,5}

The HIV epidemic in SA until 1990 had a similar pattern to the European and American epidemics, small in number and predominantly affecting haemophiliacs, men who have sex with men (MSM), and intravenous drug users.⁶ The 1990s heralded a sudden and dramatic increase in new infections and, despite much research, the drivers of this increase are still poorly understood. Several theories have attempted to explain the increase, from sexual and cultural behavioural issues, to peculiar characteristics of the local virus, to medical practices, to inherent susceptibility of the local population. Data on how needle re-use as part of the syphilis and trypanosomiasis control programmes in the last century provided an explanation for the establishment of a central and East African epidemic do not satisfactorily explain SA's epidemic.⁷⁻⁹ Commonly cited theories regarding distinct forms of sexual partnering as causally explaining the huge difference between southern African incidence rates and the rest of the world have increasingly been challenged.¹⁰ The lack of clarity about the driving forces behind the increase has meant that prevention efforts have been unsuccessful.

SA has several large independently run observational HIV prevalence studies, which have documented the growth of the epidemic in the past two decades, with some of the most accurate statistics on HIV prevalence in the world.^{5,11-13} Different robust mathematical models – with different assumptions and data use based on different surveys and observed cohorts – have been used to estimate total numbers of infections. These models demonstrate very similar findings and show that between 1.3% and 1.5% of South Africans, or just over 300 000 citizens, are currently infected annually. Some criticism has been expressed of the models' continued accuracy, when taking into account increasing life expectancy and changes in CD4 thresholds.¹⁴ A large and complex HIV-positive paediatric population, previously estimated at 70 000 per year, has been part of the treatment challenge, but has decreased since the advent of effective prevention of mother-to-child transmission (PMTCT) programmes.

The extent of this adult and paediatric epidemic, both in absolute numbers and overall prevalence, has made SA a focus of public health advocates, donors, researchers and political commentators.¹⁵ Attention on SA has been magnified, as the world's largest and arguably most ambitious antiretroviral (ARV) programme is being rolled out across the country at considerable expense.¹⁶ The government programme, available since April 2004, has transformed care from simple palliation for people dependent on the public sector to the institutionalisation of HIV as a chronic disease requiring life-long care. As of the end of 2012, about two million people were accessing antiretroviral therapy (ART), with a

projected return to normal life expectancy for those that started treatment timeously and very low mother-to-child transmission (MTCT) rates.^{15,17-19}

Political and policy history of the South African HIV treatment programme

It is helpful to distinguish three politically related eras in ART care: pre-2004, during which period ART was not available in the public sector; 2004-2008, during which the public programme was launched and run, despite interference from senior political figures; and after 2008 which heralded a new political dispensation and a subsequent reorienting and scale-up of the programme.

In 2002, the head of the South African HIV programme assembled a group of clinicians and economists to design the ART component of the HIV programme. The political pressure leading up to this event was significant. The then Thabo Mbeki-led government had come under increasing pressure from local and international bodies for its public policy towards HIV, especially on the issue of ART usage and availability in the public sector.²⁰ Owing to a variety of personal opinions in the ranks of senior leadership within the African National Congress (ANC) on the existence of HIV and the efficacy of ART, there was little coherence or leadership shown in the approach to HIV and its treatment.²¹ The Treatment Action Campaign (TAC), a South African civil society and community-based HIV treatment advocacy group, strategically employed mass protest, litigation and media interaction to leverage action from the National Department of Health (NDoH). The TAC together with the then AIDS Law Project (now Section27), a non-governmental organisation (NGO), legally challenged government policy on HIV treatment. Strategic alliances in these legal cases, which included large local clinician groups, such as the Southern African HIV Clinicians Society and *Médecins Sans Frontières*, allowed for a broad and united front against the government's denialism, and against pharmaceutical patent holders as a means to decrease antiretroviral costs.^{5,21-25}

The issue of denying HIV care on the basis of whether ART worked or not grew increasingly contentious. Internal to the ruling ANC, several senior members began advocating that treatment be available including Nelson Mandela.²⁶ The Deputy Health Minister Nozizwe Madlala Routledge, a strong supporter of ART treatment, was dismissed in 2007, after she spoke out against government AIDS policy and coordinated broad consultation of a new AIDS plan.^{23,27,28}

In 2009, Dr Aaron Motsoaledi was appointed as Minister of Health by newly elected President Zuma. Motsoaledi immediately made HIV treatment a priority in the NDoH. Since then, political controversy around the ART programme has dissipated. SA was introduced at the 2010 International AIDS Conference as a worldwide treatment success, with senior politicians receiving a standing ovation – a far cry from the country's reception at the same conference a decade earlier.²⁹

In addition, the South African National AIDS Council (SANAC), responsible for coordination of the HIV response between

government and civil society, was revived in 2011 and led the generation of the widely acclaimed 2012-2017 National Strategic Plan (NSP).³ The political normalisation of the ART programme has allowed for focus on several scientific, medical and operational challenges that underpin the South African health system's most ambitious programme.

The parlous state of HIV prevention has been revealed by the country's surveys, but was obscured for a decade by the political battle during the Mbeki era. Despite large amounts of money given to communication and condom programmes, and evidence that infection rates are decreasing, new infections remain very high.^{1,30} An article in *The Lancet* commented that the field as a whole, not just in SA, "lacked credibility with data from prevention trials showing little or no decrease in incident HIV", although the article expressed hope in the rise in number of several biological interventions. These interventions include expanding treatment, vaccines and microbicides, which may be available within the next decade.^{31,32} The failure of prevention means that continuing resources will be required for ART for those 300 000 people added annually over the next few years, until effective prevention is implemented.³³

Developments in the scale-up of ART

Prior to 2004 ART was available only in the private sector, through private funding, workplace programmes, research projects and medical aid schemes. An assessment undertaken in 2006 estimated that 100 000 people were on treatment through these mechanisms.³⁴ Medical insurance schemes began to provide ART early in the 2000s. Initially, this was because it was often cheaper than providing hospital care and later as HIV care fell into a legally binding set of prescribed minimum benefits that meant that medical aid schemes had to, at a minimum, match programmes available in the state sector. Monitoring and evaluation (M&E) figures in this sector are still not readily available, although informal discussions with key manufacturers suggest a figure in the private sector of about 250 000 in care at the end of 2012.^a ART has formed part of the rise of "managed care", with large internal treatment oversight structures within many medical aid schemes. These structures oversee doctor-prescribing decisions, as a mechanism for containing costs and enforcing rational prescribing practices on the clinician community, which is often unfamiliar with treating HIV. In addition, the well-maintained databases of medical aid schemes have allowed for several useful long-term research studies to emerge. These research studies have largely demonstrated the cost effectiveness of these programmes, and the huge costs associated with hospitalising those diagnosed and treated with ART at a late stage.^{35,36}

The public ART programme commenced officially in April 2004 in selected districts and sites. Guidelines broadly in line with World Health Organization (WHO) guidance were written and extensively reviewed by local and international experts the previous year. The local guidelines contained many restrictions on access, such as few selected sites per district with lengthy training preparation, onerous preparation for patient adherence, and prescribed staffing norms (e.g. site-level dietician).

Initial access to ART for state-dependent patients was slow, very doctor-centred and generally confined to large central hospitals, despite large numbers of ill patients that required immediate therapy. Provincial autonomy meant that guidelines were variably interpreted, with reports of some patients requiring protracted adherence training before initiation. This training was often applied in specialist clinics, especially for paediatrics. Some hospitals insisted that in-patient initiation take place. Target setting was often arbitrary, with provinces simply setting ART treatment numbers they decided were practical with little regard for the rapidly escalating HIV disease burden. Delays in start-up and implementation of the programme had profound mortality implications. One academic estimation, which compared the speed of rollout between SA and its neighbouring countries, found that – under the Mbeki reign – conservatively over 300 000 adults died while 35 000 children were unnecessarily infected with HIV due to delays.³⁷

Critically, a severe lack of integration existed between the HIV programme, on the one hand, and both tuberculosis (TB) and antenatal services, on the other, despite evidence that 70% of patients were TB-infected and that half of HIV-positive people were likely to acquire TB during their lifetime, and that over a third of pregnant women were HIV-positive.³⁸ This was partly as a result of the political environment at the time, with some government officials suggesting that the programmes be kept apart, so as not to stigmatise TB patients as all being HIV positive.³⁹ In addition, the TB programme had been underfunded for decades, despite evidence of a rising new incidence problem, and was performing very poorly in terms of cure and completed treatment protocols. This rising burden of TB on the existing health services, with a new focus on targets but without the requisite resources, meant that the TB programme responded poorly to the integration demands of the HIV programme. This began to change from 2008, partly with the recognition of the TB prevention and treatment benefits of rapid ART initiation and recognition of the multidrug-resistant (MDR)-TB epidemic. Currently, the programmes still have much to do regarding integration, but new diagnostics, new drugs and the recognition of infection control have instilled much needed vitality within the TB programme.⁴⁰

Antenatal services integration issues were complex. Initially, the PMTCT programme relied largely on HIV testing in pregnancy, coupled with a very simple prevention regimen during labour and immediately after delivery.⁴¹ As more effective but complex drug regimens became part of the programme, several operational deficiencies within the antenatal services began to have an impact on PMTCT provision of care. In particular, late booking within the service and the high loss to follow-up after initiation of ART within antenatal services were challenges. Referral to dedicated ART sites by antenatal services simply led to an unacceptably high loss to follow-up rate. The establishment of treatment sites within the antenatal services was attempted, with variable success.⁴² Ambitious expanded PMTCT guidelines have been heavily debated, with many arguing that services are not strong enough to sustain the newer treatment options.

Under Minister Motsoaledi, the HIV programme began normalising.^{15,43} The Minister publically insisted on better integration between the HIV, TB and antenatal programmes, and questioned why nurses were not allowed to initiate and monitor ART, as they were doing in other countries. New guidelines allowed

^a Personal communication with senior member of a major pharmaceutical company supplying ARVs to the state programme. November 2012.

for a shift from a cheap but toxic and twice-daily dosed drug, stavudine, to a better tolerated once-a-day regimen for both adults and children, with simplified monitoring, expanded treatment for TB and improved regimens for the PMTCT.⁴⁴ Large reductions in tender ART price secured in cooperation with the Clinton Health Access Initiative and the President's Emergency Plan for AIDS Relief (PEPFAR), with decreased monitoring and task shifting to lower tiers of staff, meant that the annual inclusive cost of treatment began to drop below R5 000.^{45,46}

Coverage of ART expanded rapidly after 2008, and Statistics South Africa (StatsSA) and the NDoH announced that South African life expectancy was increasing for the first time in decades owing to the success of the rollout. Data suggested that MTCT had dramatically decreased with the effective use of ART, leaving fewer children to treat.^{11,19} As the politics around HIV and ART subsided, the programme began to focus on setting more long-term goals, such as retention in care and raising the CD4 count at initiation. Newer guidelines focused on accelerating access to ART and single-dose formulations, expanding access to all TB patients and infants, and improving the quality of PMTCT regimens.^{19,46}

Challenges in ART scale-up

In 2008, the Free State stopped initiation of new patients on ART almost overnight, citing a lack of funding.⁴⁷ This occurred during the transition from the Tshabalala-Msimang era to the leadership of Barbara Hogan, a veteran from other government financial oversight agencies. Hogan publically expressed concern about the levels of poor financial planning and overall performance within the department.

The Free State took several months to reverse the decision to suspend ART provision, despite extensive mobilisation of civil society and threats of legal action. Money was urgently transferred from the NDoH to pay for medication, funds that were initially used by the province to pay other outstanding health bills. The Southern African HIV Clinicians Society conservatively estimated that during the interruption of services about 30 people died daily unnecessarily within the province while large numbers of infants were infected.⁴⁸ The crisis revealed that health financial and programme planning within all the provinces was poor with the exception of Western Cape. At the time, the health departments of KwaZulu-Natal (KZN) and Gauteng had spent their entire budgets, but did not curtail services. In 2012, the Free State, Gauteng and Limpopo were subsequently put under curatorship by the Treasury as a result of poor financial management.⁴⁹

The ART programme became the 'canary in the coal mine', as many donor programmes demanded regular reporting. Antiretroviral drug stock-outs and restrictions on access to ART, poor laboratory performance and other indicators were investigated over the years that followed and usually revealed broader systems failure within the health departments. At the start of 2012, antiretroviral stock-outs of one of the first-line adult therapy drugs, tenofovir, because of poor coordination between the roleplayers meant that large numbers of patients had the drug substituted with more toxic but widely available drugs. In some cases, paediatric formulations were inappropriately used, which led to a shortage in ART for this subpopulation too. Drug stock-outs continued to be a problem throughout 2012, largely due to poor coordination between

provincial supply depots and clinics. Additionally, the non-payment of suppliers led to multiple interruptions in other services. At the time of writing, fraud and corruption investigations into large drug-supply depots in Gauteng and the Eastern Cape were being conducted, again accompanied by broad reports of stock-outs of medicines for several chronic diseases.⁵⁰ HIV is no longer a routine health political flashpoint. Activist organisations such as the TAC have focused more on securing safer and more varied medication within the state programme and the AIDS Law Project has been incorporated into a much broader legal social movement – Section27 – which continues to play a role, although a lower profile one, in the field of health.⁵¹

Despite the large supply-line and operational difficulties, the transformation of policy responses to the HIV epidemic – from the Mbeki to the Zuma era – could not have been more profound. Widespread acknowledgement of the scale of the HIV problem now exists, with none of the mixed messages of the previous administration. SANAC, which was supposed to direct the overall HIV responses from every sector within the country, has been reconstituted and has new and dynamic leadership.⁵² Civil society also now appears to play a far more directive role in the HIV response, which includes a stronger coordinating role when it comes to donors.

South African treatment debates

The South African public and private ART guidelines have broadly followed WHO guidelines, although amendments have often been delayed in the case of public guidelines. Drug choices and laboratory monitoring currently reflect WHO and regional guidelines and are similar to the guidelines in many developed countries. Exceptions are the restrictions in access to more expensive medicines and less laboratory monitoring.^{53,54} Theoretically, a South African state-dependent patient should receive similar ARVs to counterparts in New York or London. This has been the result of widespread activism, with litigation threats, and of negotiations between generic manufacturers and the originator. Patients with highly drug-resistant virus are an increasing problem. The NDoH and Southern African HIV Clinicians Society are currently formulating guidelines for both the public and private sectors, with new provision of ART for these patients in the state sector.⁴⁶

A large international public health debate hinges on "when to start" in terms of immunological criteria, measured by the CD4 count. There is clear benefit to the individual in starting HIV treatment before reaching a CD4 count of 350 cells/ul. In addition, large benefits in terms of TB control, maternal mortality and MTCT are realised at this level.⁵⁵ During 2012, SA raised the treatment threshold to a CD4 count from 200 to 350 cells/ul for all; pregnant women and anyone with TB are given ART irrespective of CD4 count.^{19,44}

The big HIV treatment and prevention news of 2011 was a study called HPTN 052, which demonstrated that treating people on ART essentially renders them non-infectious.^{56,57} This study, coupled with several compelling observational studies, has led to widespread and popular calls for the introduction of "treatment as prevention" – initiation of antiretrovirals irrespective of immune status. However, the study's early data demonstrated marginal clinical benefit for the individual's health when starting early, which leads to the question:

Table 1: 'Starting earlier' versus 'starting later' – public health implications and individual benefit^{55-57, 60-63}

Benefits of starting ART earlier	Definite decrease in transmission to sexual partners	Definite decrease in incidence of TB	Possible decrease in long-term 'non-AIDS' complications – cardiovascular, renal and liver disease	Definite decrease in transmission to infants in PMTCT and breastfeeding mothers	Possible better retention in care	Definite prevention of movement into the high-risk mortality and morbidity zone, hence less hospitalisation	Probable cost saving in long term
Disadvantages of starting ART earlier	Possible decreased adherence as healthier people take treatment	Definitely more time spent in medical facilities – out-of-pocket costs, impact on employment, exposure to TB	Possible prolonged exposure would mean more possibility for resistance and toxicity to develop	Definite increase in immediate cost	Definite increased treatment burden on already dysfunctional healthcare system	Definite increase in balance of payment deficit, as ARV ingredients are being sourced internationally	

would people take medication for their partner's health when the benefits to themselves are small?^{56,58}

This has yet again drawn the “when to start” adult debate into sharp focus. Criticism of the call to “treat everyone” has varied from scepticism about whether health systems would cope with a large number of healthy patients entering the system to the lack of better evidence for community-level impact, to costs associated with expanding the programme (see Table 1). At present, little appetite is apparent from the NDoH for increasing the 350 threshold because of concerns about escalating cost and increased burden on healthcare facilities.

For children, there is clear evidence, that earlier treatment is beneficial below the age of two years, and is now a South African programme recommendation.⁵⁹ Because the volumes of antiretrovirals for children are much smaller than for adults, and the choice of medications and formulations different, children are more susceptible to supply-line issues than adults, and have fewer options for immediate substitutions. Fortunately, the PMTCT programmes in the country have been relatively successful, with transmission rates below 3%, down from about 30%.¹⁹ However, HIV-positive children and adolescents are underserved, and specific service delivery models are probably required for this group.

Operational issues around treatment

The efficacy of the programme has generally been good, with good viral suppression, retention in care and clinical outcomes reported across multiple sites and cohorts throughout the country.

A major obstacle in the first four years of the programme, partly driven by the hostility to the ART programme at the NDoH level, was the issue of accreditation of facilities to provide ART services. Facilities could only provide ART care if they were accredited, with specific standards related to staffing and clinical space. Ostensibly, this was a worthy procedure (although not required for other forms of chronic care), as it meant that facilities were assessed for ability to deliver ART services effectively. However, the assessments were often not matched by necessary resources to address deficiencies; nor were there follow-up processes to ensure that facilities were still providing care at the prescribed level. The process of accreditation fell into disuse several years after the programme started, as decentralisation of the growing numbers of patients became far more common.

HIV programmes re-awakened a debate on vertical versus integrated services. The focus on the ‘specialness’ of the ART programme annoyed many local clinicians, facility managers and programme implementers, with some justification – HIV patients were being ‘exceptionalised’ in terms of their access to care. Interestingly, this was largely the result of the peculiar HIV-specific demands from the NDoH. These demands concerned the accreditation process, excessive reporting, onerous preparation of patients for treatment, and insistence on unnecessary staff positions – such as dieticians – within clinics. Additionally, a large focus by NGOs on this patient population led to the peculiar situation where HIV-positive people would have access to expanded services, which included food parcels, while HIV-negative patients in an immediately adjacent clinical service would go hungry. Decentralisation of the programme and decreased funding for HIV-linked NGOs have meant that many of these aberrations have disappeared. There are widespread concerns, although not much empiric data as yet, that the move to more integrated chronic care services will mean poorer outcomes on ART programmes.⁵¹

Programme monitoring and evaluation (M&E) has also been a huge challenge. Initial NDoH reporting procedure in 2004 used a multi-page questionnaire based on WHO recommendations on a per-patient basis. This was so onerous that most sites immediately abandoned the procedure. Local ‘registers’ proliferated, with sporadic and inaccurate reporting to the NDoH on the number of patients on treatment and treatment outcomes. Outcome reporting has almost exclusively been seen at research-supported sites and at sites where donors have invested in expensive M&E systems. For the first few years of the programme, pharmaceutical company reports on specific drugs issued allowed for rough estimates of numbers on treatment. Certain drugs were used exclusively in first-line and similarly in second-line treatment, which allowed for even rough estimations of movement between these. However, as more drug companies competed for tenders, and as treatment guidelines changed, these estimations became less useful. The government subsequently relies on a combination of various local reporting to estimate the numbers started on treatment. Reassuringly, despite the poor local reporting, the provincial-level aggregated numbers roughly correspond to early pharmaceutical reported numbers.

A new three tier strategy for monitoring ARV provision has been introduced by the NDoH but is still in its infancy.

The movement to a nurse-based initiation and monitoring HIV programme – as implemented in most other African countries – was very slow, and the programme therefore remains largely hospital based and doctor centred.⁶¹ However, research has demonstrated that nurse-based care is safe and effective if adequate training and referral mechanisms exist.⁶⁴ Significant resistance has been shown by nurses and doctors to the treatment of children. Children are more complex to manage in terms of both dosing and adherence, which often has to be negotiated with a caregiver.

Medication stock-outs have emerged as a major threat to the programme, as detailed above. The sheer scale of manufacture and tight margins, reliance on international sources for active pharmaceutical ingredients, and intense competition between drug companies mean that manufacturing is susceptible to disruption if anything goes wrong. Poor forecasting and untimely ordering by provinces further stress manufacturing capacity. Even where drugs are available, supply lines seem poor, with slow and often inadequate distribution from the depots to local clinics.

Laboratory infrastructure was sorely tested by the ART programme. The National Health Laboratory Services (NHLS) provides comprehensive laboratory services to all government-run facilities. SA's decision to use viral load monitoring created an unintended crisis within the NHLS – the machines used for this purpose were not constructed to deal with large volumes of samples. Suddenly new technicians and laboratory space were required across the country, and the NHLS had to decide to what extent the service needed to be centralised. In addition, constraints in CD4 monitoring capacity escalated, along with polymerase chain reaction testing for infants – both expensive procedures. Fortunately, the NHLS has an active Research and Development department, which had earlier identified a simpler and cheaper way to measure CD4 accurately and to use dried blood spots to facilitate infant testing. In 2011, a funding crisis hit the NHLS. Gauteng and KZN defaulted on payments that totalled billions of rands of debt owed to the NHLS.⁶⁵ The NHLS, unable to carry the large deficit, lost a large number of skilled staff, as rumours of bankruptcy loomed until a partial settlement was achieved with the NDoH. Premature implementation of the GeneXpert rapid TB diagnostic machine at a facility level further stressed the system, when the NHLS was asked to expand access to the machine for poorly prepared clinics. However, the NHLS is an important component of new implementation programmes (such as the new proposed cryptococcal prevention programme) and is an underutilised M&E resource.⁶⁶

Access to care of specific subpopulation

Adolescent patients pose a specific challenge to ART programmes.⁶⁷⁻⁶⁹ While many female adolescents acquire HIV during their late teens, most adolescents who require ART acquired HIV perinatally. Childhood HIV frequently leads to stunting, especially when HIV diagnosis and ART are delayed. This adds to the psychological complexity of an already difficult time in the life of an individual. Limited data suggest that many parents delay informing children about their diagnosis, for fear of inadvertent 'playground disclosure', sometimes into adolescence. Attempts to provide specialised adherence, psychological and treatment services are hampered by the wide distribution of this age group

throughout the country and the lack of a functional school health programme.

Foreigners are eligible for ART through the public health sector. A circular in 2005 from the NDoH clarified that possession of a green identity book, previously used as an entry criterion for accessing care, was not required for access to public health facilities.⁷⁰ In areas with high densities of non-nationals, such as Hillbrow in Johannesburg, treatment programmes have demonstrated HIV treatment results at least as good as those seen with South African citizens.⁷¹ Widespread anecdotes of services being restricted by xenophobic healthcare staff have been reported. However, in contrast to other countries, SA has a relatively non-restrictive access policy to primary care services. This means that treatment for TB and HIV, when uncomplicated, can be given to foreigners – even those illegally within the country.

Data suggest that African MSM are at higher risk for HIV acquisition than is the general population. This also applies in SA.^{69,72,73} In many other countries, aggressive homophobic rhetoric from political leaders and restrictive legislation have attracted international condemnation for driving this already stigmatised group underground. SA has very progressive laws regarding gay rights, which include the right to marry, but has seen reports of homophobic statements and even attacks on people who have publically declared themselves as gay.^{74,75} However, the NSP has identified the gay community as a key subpopulation and pays more attention to gay issues. With dedicated funding from donor agencies, such as PEPFAR and others, it appears that progress may be made within this group.³

While sex workers contribute only a small percentage of estimated HIV infections within the South African epidemic, they are identified as a discrete and important subgroup for prevention and treatment services.^{3,69} Access to this group is largely hampered by the fact that the profession is criminalised and that this population is poorly understood.^{76,77} The new NSP calls for the decriminalisation of sex work as a mechanism to address HIV prevention more efficiently and get sex workers into care.

Gender access has also been an issue, with disproportionate numbers of women accessing the ART programme.¹⁷ One reason may be that women are often more familiar with clinical services, as they access these routinely for pregnancy and contraceptive services and are often caregivers to children. This familiarity with services may mean that they attend earlier and more consistently once they get ill. Other reasons may be more complex masculine perceptions around illness. Currently, over 60% of the adults that access the programme are women. This is grossly disproportional to the distribution and profile of the epidemic by gender. Accessing men with more innovative approaches, such as the current male circumcision or HIV testing programmes in workplaces, may improve this ratio.

Financing of the ARV programme

How countries will probably deal with the continuing and increasing HIV treatment burden appears to vary according to prevalence and income. Low-prevalence countries – such as Vietnam, Brazil and Thailand – internally fund their responses to the epidemic while poorer high-burden countries remain heavily dependent on donor funding.^{16,78} Currently 50% to 75% of the cost of the programmes in most countries is consumed by antiretrovirals. SA is seen as a unique case – high HIV burden, but with the ability and necessary resources to deal with the growing number of people that need treatment.

Although its initiation and expansion were initially supported by donors, the South African programme was self-sustained from the beginning, as it was almost entirely funded from the national fiscus. In most developing countries, over 80% of the HIV programmes are funded by donors. In SA, this figure has not exceeded 20% at any point and it is currently probably less than 10%.¹⁶ At present the HIV programme consumes just under 10% of the South African government's total health expenditure and 0.82% of the country's GDP. This last figure is projected to rise to 1.13% in 2015 and thereafter to fall during the next 15 years.¹⁶ As patients accrue on the programme, the medication budget will increase commensurately. One modelling exercise suggests that the HIV programme will double in cost between 2010 and 2017 and projects that SA will spend US\$ 64 per citizen to combat the disease by 2031.¹⁶ The overall cost of the programme has drawn criticism from politicians, health planners and the Treasury.⁷⁹

Detailed costing of the public ART programme has allowed for identification of cost-saving potential.^{45,46} In 2010, the NDoH convened a large group of clinicians, which advised decreasing the number of routine laboratory tests. This was supported by local data, which suggested this could be done safely. A similar consultation on choices of antiretrovirals in first-, second- and subsequent regimens occurred in 2012, and a R6 billion tender has been awarded for the 2013-2014 period.⁴⁶

The largest part of the cost of the ART programme in SA is staff costs, driven by relatively high health salaries when measured against other African countries. Task shifting of ART to less skilled and lower paid staff has been shown to be effective in SA,^{80,81} but the move to nurse-based ART initiation and monitoring only really began in 2010. This was despite several successful and innovative projects within KZN years prior to this date.

This delay in moving to a nurse-controlled model of care meant that there was a disproportionate focus on hospital-based and doctor-driven ART clinics. Helen Joseph Hospital's HIV clinic in central Johannesburg had almost 30 000 patients on ART in 2012^b and may be the largest ART clinic in the world, despite efforts to down-refer patients. More decentralised models in the inner city in Johannesburg and elsewhere have successfully demonstrated that primary health clinics can effectively initiate and monitor treatment.⁸² However, these decentralised models rely on constant support, especially for up-referral of patients.

In addition to task shifting, the idea of an informed patient has gained credibility within programmes. High levels of adherence and problem-solving ability have been seen in patients who have

been taught about their illness and their medication. Excellent adherence levels, previously only seen in transplant programmes, have been seen in most well-run ART programmes. The contrast with other programmes has been noted by several commentators, including MSF. Spontaneous patient interventions – protests over medication stock-outs, arranging medication 'pick up' clubs – have been supplemented by support and adherence clubs in several pilot projects. These initiatives work in conjunction with community mobilisation and treatment literacy campaigns. In communities with high treatment literacy interventions, mobilising protests around treatment interruptions, perceived poor service delivery or other programme and policy issues has meant direct engagement between patients and their communities, and implementers and politicians. This engagement has often led to the rapid resolution of problems.

The rise of donor agencies in support of ART

International funding for HIV, TB and malaria reached US\$ 26.66 billion in 2010.⁷⁸ The Joint United Nations Programme on HIV/AIDS (UNAIDS) estimates that 26 out of the 33 worst-affected countries are reliant on donors for more than half of their HIV spending.¹ In Malawi, for example, where 40% of all government funding comes from donors, funding has been frozen in reaction to poorly performing programmes and for politically motivated reasons around human rights and freedom of speech, which include homophobic legislation.⁸³ Donors have often been accused of driving a homosexual agenda or of driving corruption because of poor oversight of spending.^{74,84} Concern has been expressed in donor-supported countries, where ambitious and expensive amendments to HIV treatment guidelines have been made with no evident consideration for the cost. PEPFAR and the Global Fund programmes have been criticised for allocating a large percentage of their contribution to middle-income countries, although these have been hyper-prevalent countries such as SA, Botswana, Namibia and Swaziland. PEPFAR has also been accused of driving several controversial programmes such as those that discourage condom use.

Donor engagement with HIV treatment programmes in SA has been significant. In 2003, USA President George W. Bush announced the launch of PEPFAR, the multi-billion dollar programme that largely supports HIV treatment, care and prevention programmes. PEPFAR now accounts for half of all international spending on HIV.¹ PEPFAR's large donation to SA, coupled with ambitious international treatment targets, helped kick start the South African ARV programme in 2004.

PEPFAR was not immune to criticism. The onerous application process, M&E requirements and financial reporting placed a large burden on recipient NGOs. Critics have charged that this deflected already overburdened organisations towards administrative tasks and away from their core business. In addition, there was suspicion regarding the conservative politics of the USA, especially when PEPFAR programmes in other countries were seen as undermining condom use and where a large percentage of prevention funding was focused on controversial abstinence programmes. However, the bulk of its funding in SA went towards funding direct service delivery, medication, and training and salaries supporting greater access to treatment.

^b Personal Communication: Ian Sanne, 2012.

Recently, controversy has surrounded the withdrawal of funding by donor programmes. PEPFAR has announced a 50% reduction in funding over five years to 2017, requiring most PEPFAR-funded programmes to transfer staff and patients back into the government health sector (referred to by the Health Minister as the “nationalisation” of the HIV programme).⁸⁵ In addition, the influx of donor funding meant many NGOs grew dramatically, and the withdrawal of funding has recently led to down-sizing.⁸⁶ In some areas, the South African NDoH is ill-prepared for this influx of patients, which has led to outcries that patient care has been compromised. The government, which often deals with multiple stock-outs of drugs, has not provided care at the level that many NGOs have been able to do with focused HIV treatment and care programmes. As a consequence the transition process has been fraught with delays and disturbances in some places.

Similarly, the Global Fund to Fight AIDS, TB and Malaria, formed in 2002, has had a major impact on treating HIV, with the Fund claiming that 8.7 million lives have been saved by its programmes internationally.⁸⁷ Despite evidence that the Fund is in most cases well administered – accounting for one-fifth of all HIV-linked investment in 2009 – several high-profile cases of corruption and poor programme implementation in 2011 dented the Fund’s image. This occurred alongside the global recession and many national governments not meeting their obligations in terms of pledges to the Fund. The effect was the ‘cancelling’ of new funding obligations to many poorer countries that had critically underfunded ARV programmes.⁸⁶ Many commentators have said that this was a cynical way for donor governments to skirt their commitments. The Global Fund has had a long history with SA, with over US\$ 300 million flowing to the country, two-thirds of which is being spent on the ART programme.

Other large funders, including the Netherlands and Nordic countries, European Union, DFID, and the Bill and Melinda Gates Foundation, continue to fund aspects of SA’s HIV response and have been major supporters of NGOs. However, the recession and financial crisis have meant that many funding programmes have been rationalised and funding amounts decreased. These challenges have led to a renewed focus on internal funding of non-governmental groups and there has been criticism of external funding mechanisms and the lack of local accountability of internal funding of NGOs through large donors such as the National Lottery.⁸⁸

Conclusion

Expanding treatment access up to the CD4 count of 350 cells/ul threshold remains the priority for the ARV programme. This will realise the benefits of ‘treatment as prevention’, decreased maternal mortality and paediatric infections, decreased burden on outpatient and inpatient clinical care, and decreased community-wide TB.⁸⁹ In addition, economic consequences, especially out-of-pocket expenses for patients, will decrease. Continued focus on regular HIV testing is required to ensure that treatment is initiated as close to the CD4 350 threshold as possible. The NSP plans to put over 400 000 people on treatment annually, a situation that will continue for as long as prevention programmes are not effective. Challenges lie in the continued assurance of adherence and a growing number of patients requiring ‘third-line’ medication. Special groups, such as adolescents, mobile populations, refugees, foreigners, sex workers and others, require tailored services.

However, the state of many public health systems, especially in terms of medicines supply and service delivery, threatens the expansion of successful treatment programmes.^{51,61} Interventions related to the proposed National Health Insurance system and the establishment of core standards of care for all health facilities will hopefully address these challenges.¹⁵ However, creative thinking is required to allow the huge number of healthy patients on ART to avoid unnecessary (and dangerous in the case of TB exposure) visits to health facilities. In many other countries patients with chronic diseases, including HIV, have laboratory results reviewed distantly and their medication delivered at home if they have no complaints. The management of HIV lends itself to this approach, as the vast majority of patients are rendered asymptomatic.

The ARV rollout has been a complicated and qualified success, teaching us much about public health programmes that have grand ambition. Maintaining and improving the rollout in the context of complicated policy and operational challenges will, however, continue to challenge us if we are to maintain this success.

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Maternal, Newborn and Child Health



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Maternal and child mortality rates are declining on a global level, although progress remains insufficient to achieve Millennium Development Goals 4 and 5 by 2015. Although South Africa (SA) continues to experience unacceptably high maternal, newborn and child mortality rates for a middle-income country, the under-five mortality rate has declined significantly in recent years whilst recent data suggest that the maternal mortality ratio (MMR) has also begun to decline.

The past few years have been characterised by a number of international and national commitments and interventions that focus on improving maternal, newborn and child health. At an international level ensuring provision of evidence-informed packages of care to all women and children continues to be regarded as the key to improving maternal and child health, while the importance of addressing equity, increasing accountability and strengthening the health system are increasingly recognised. In SA, the Negotiated Service Delivery Agreement highlights reductions in maternal and child mortality rates as one of the four strategic outcomes for which the health sector must account, while the first National Maternal, Newborn, Child and Women's Health and Nutrition (MNCWH&N) Strategic Plan provides a road-map for achieving improved survival and health for women and children. Restructuring of primary health care (PHC) also provides an opportunity to improve coverage and quality of maternal and child health services through reaching learners in schools, reaching households through visits by community health workers and improving clinical governance at district level through deployment of clinical specialist teams.

Weaknesses and inefficiencies in the health system will need to be addressed if current gains in maternal and child survival are to be maintained and accelerated, and the potential benefits of PHC restructuring and other efforts to improve maternal and child health are to be realised. Human resource capacity to deliver quality maternal and child health services will need to be strengthened, while monitoring systems must be improved to facilitate both improved planning and greater accountability.

Programmatic priorities include improving care at district hospital level, especially with regard to management of obstetric emergencies, newborn care and better care for acutely ill children. As child survival improves, more emphasis must also be paid to ensuring that all children reach their full potential – this will require improvements in the nutritional status of all children, ensuring that all children receive the full package of preventive health services and implementation of other early childhood interventions at scale.

This chapter provides an overview of maternal, newborn and child survival, global and national commitments and strategies that aim to improve maternal and child health, as well as progress in implementing priority interventions outlined in the MNCWH&N Strategic Plan. In the final section, priority actions are identified.

Restructuring of primary health care provides an opportunity to improve coverage and quality of maternal and child health services through reaching learners in schools, reaching households through visits by community health workers and improving clinical governance at district level through deployment of clinical specialist teams.

Maternal, newborn and child survival

Global mortality rates and trends

Recognition that improvements in the health of women and children hold the key to making progress towards all development goals and the approach of 2015 – the target year for achievement of the Millennium Development Goals (MDGs) – have served to refocus global attention on maternal and child survival.¹

Overall there is reason for optimism, especially with regard to progress in reducing child mortality. The number of under-five deaths worldwide has declined, from nearly 12 million in 1990 to 6.9 million in 2011, and the rate of decline has accelerated – from 1.8% per year during the 1990s to 3.2% per year between 2000 and 2010.² While that translates into 4 000 fewer children dying every day in 2011 than in 1990, 19 000 children under five years of age still died every day in 2011 and the MDG 4 target of reducing child deaths by two-thirds by 2015 will not be achieved.³ Under-five mortality is also increasingly concentrated in particular regions, with 70% of the world's under-five deaths in 2009 occurring in only 15 countries and about half of the deaths occurring in just five countries (India, Nigeria, Democratic Republic of the Congo, Pakistan, and China). In addition, although data are available for only 38 countries, a recent review concluded that more countries experienced an increase than a decrease in relative disparity in child mortality rates between rich and poor over the last two decades. The inference is that, even though national under-five mortality rates have been reduced in many countries, disparity in mortality rates between poor and rich has generally increased and that child deaths (and undernutrition) are, therefore, becoming increasingly concentrated in the poorest and most deprived communities.⁴

Maternal mortality has declined more slowly, although the annual rate of decline at a global level has risen – from 2% between 1990 and 2000 to 3.4% between 2000 and 2010.⁵ Globally, an estimated 287 000 maternal deaths occurred in 2010, a decline of 47% from levels in 1990, but far below the three-quarters reduction required by 2015 for the achievement of MDG 5.³ Maternal mortality is also becoming more concentrated in certain regions, with sub-Saharan Africa and southern Asia accounting for 56% and 29% respectively of the global burden in 2010.⁵

Globally, the neonatal mortality rate has declined by approximately one-third, from 32 deaths per 1 000 live births in 1990 to 22 deaths per 1 000 live births in 2011 – an average decline of 1.8% a year. This is much slower than for under-five mortality and means that the proportion of under-five deaths that occur within the first month of life (the neonatal period) has increased, from 36% in 1990 to 43% in 2010.²

At a global level, haemorrhage remains the leading cause of maternal death, followed by hypertension and other indirect causes.¹ The leading causes of death among children under age five are pneumonia (18% of all under-five deaths); preterm birth complications (14%); diarrhoea (11%); intrapartum-related complications, complications during birth (9%); and malaria (7%). Child mortality is strongly associated with undernutrition, with more than a third of under-five deaths being attributable to undernutrition.²

South Africa: mortality rates and trends

Estimates of maternal and child mortality in SA, which have historically been characterised by lack of consensus and a reliance on outdated figures, have been reviewed in detail in previous editions of the *South African Health Review*.^{6,7} This section, therefore, focuses on recent developments, particularly with regard to progress that has been made in reaching consensus on the methodologies to be used in calculating official national estimates of maternal and child mortality rates and trends.

The Health Data Advisory and Co-ordination Committee (HDACC), which was appointed to improve the quality and integrity of data on health outcomes and to advise on indicators, baseline values and targets for the Negotiated Service Delivery Agreement (NSDA) for the period 2010 to 2014, recommended that Rapid Mortality System (RMS) data be used for monitoring child deaths.⁸ The committee further recommended that Statistics South Africa (StatsSA) data on cause of death be used to monitor maternal deaths and adjusted District Health Information Systems (DHIS) data be used to calculate neonatal mortality. RMS data are based on notification of deaths and provide limited data on each death within a shorter period of time as compared with vital registration data. The RMS data are adjusted for deaths that are registered but are not on the national population register, as well as for deaths that have not been registered. The committee has further recommended that population estimates produced by the ASSA2008 AIDS and Demographic Model be used for calculating mortality-related indicators.⁹

Baseline values contained in the HDACC report as well as figures calculated using the same methodology for subsequent years are shown in Table 1. The targets proposed by HDACC for achievement by 2014 are also shown.

Maternal deaths

As shown in Table 1, maternal deaths were estimated to increase from 310 per 100 000 live births in 2008 to 333 per 100 000 live births in 2009.¹⁰ The Saving Mothers Reports also reported an increase in the institutional Maternity Mortality Ratio (iMMR) from 152 deaths per 100 000 live births for the 2005 to 2007 triennium¹¹ to 176 deaths per 100 000 live births for the period 2008 to 2010.¹² These results were disappointing, particularly given that the revised prevention of mother-to-child-transmission (PMCTCT) guidelines, which included initiation of antiretroviral therapy at a CD4 count of 350, were introduced at the beginning of the 2009/10 financial year. However, the 2011 interim report showed a decrease in the iMMR to 153 deaths per 100 000 live births. This represents a 13% reduction, which is almost entirely the result of the reduction in deaths from non-pregnancy-related infections (mainly deaths in HIV-infected pregnant women complicated by tuberculosis (TB) and pneumonia).¹³ Although confirmation from other sources is still required, these figures suggest that maternal mortality peaked in 2009 or 2010 and is now declining.

Table 1: Maternal and child mortality rates, South Africa

Indicator	2008	2009	2010	2011	Target 2014
Under-5 Mortality Rate (U5MR)		56 per 1 000 live births	53 per 1 000 live births	42 per 1 000 live births	50 per 1 000 live births (10% reduction)
Infant Mortality Rate (IMR)		40 per 1 000 live births	37 per 1 000 live births	30 per 1 000 live births	36 per 1 000 live births (10% reduction)
Neonatal Mortality Rate (<28 days)		14 per 1 000 live births	13 per 1 000 live births	14 per 1 000 live births	12 per 1 000 live births (10% reduction)
Maternal Mortality Ratio (MMR)	310 per 100 000 live births	333 per 100 000 live births			270 per 100 000 live births (reverse increasing trend)

Source: National Department of Health, 2011;⁸ Medical Research Council, 2012.¹⁰

The Saving Mothers Reports have consistently identified five major causes of maternal deaths: non-pregnancy-related infections, mainly AIDS; obstetric haemorrhage; complications of hypertension; pregnancy-related infections; and complications of pre-existing medical conditions such as cardiac conditions and diabetes.¹¹ The most recent Triennial Saving Mothers Report found that non-pregnancy-related infections accounted for 40.5% of maternal deaths, while maternal deaths due to obstetric haemorrhage and hypertension accounted for 28% of deaths (14% each).¹² Together these top three causes accounted for almost 70% of all maternal deaths. Forty percent of all maternal deaths were classified as avoidable with maternal deaths due to obstetric haemorrhage and hypertension being thought to be possibly and probably preventable in 81% and 61% of cases respectively. Maternal deaths due to non-pregnancy-related infections, obstetric haemorrhage and hypertension were the three biggest contributors to preventable maternal deaths, accounting for two-thirds of avoidable deaths with most of these deaths occurring in level 1 and level 2 hospitals.

Child deaths

As indicated in Table 1, infant and under-five mortality rates have declined rapidly since 2009 and by 2011 had exceeded the targets for 2014 recommended by the HDACC.¹⁰ This is in line with data from a retrospective review of child mortality data, which found that infant and under-five mortality rates remained roughly stable between 1998 and 2007, although at levels higher than those in the early 1990s, before beginning to decline around 2006 or 2007.¹⁴

It should be noted that these national estimates remain slightly lower than those published by the United Nations Inter-agency Group for Child Mortality Estimation, which estimated SA to have under-five- and infant mortality rates of 47 and 35 per 1 000 live births respectively in 2011.² However, both datasets show a similar rapid decline in child mortality rates since the mid-2000s, albeit at a rate insufficient to achieve the MDG 4 target of an under-five mortality of 20 per 1 000 live births by 2015. This decline can primarily be attributed to successful implementation of the PMTCT programme (see below), as well as the introduction of new vaccines against invasive pneumococcal disease and rotavirus in 2008.

Many children continue to live in poverty and child poverty remains an important underlying or contributing factor to child deaths in SA. Children who are born to poor parents and grow up in poor households are likely to remain poor, and there is evidence that disparities in income are coupled with inequities in access to services and treatment.^{15,16} Child mortality rates have been found to be four times higher in the poorest quintile (87 per 1 000 live births) than in the wealthiest quintile (22 per 1 000 live births).¹⁷

Data from child mortality audits show that the majority of deaths in children are due to a small number of conditions, with five conditions accounting for 82.6% of deaths in infants between one month and one year of age and 74.2% of deaths in children between one and five years of age.¹⁸ These conditions are acute respiratory infections (mostly pneumonia) (28.9%), diarrhoea (20.7%), septicaemia or possible serious bacterial infection (16.2% of deaths), TB (7.1%) and meningitis (6.6%). The audits also indicated that more than half of children who died had evidence of HIV infection or exposure, while 60% of children were undernourished (as evidenced by underweight-for-age or severe malnutrition).

Newborn deaths

Neonatal mortality rates fell from approximately 18 deaths per 1 000 live births in 1997 to approximately 14 deaths per 1 000 live births in 2001; this may reflect the fact that the proportion of births occurring in health facilities increased substantially during this period.¹⁴ However for the period 2006 to 2011, the neonatal mortality rate remained static at between 13 and 14 per 1 000 live births.¹⁰ This means that approximately one-third of all under-five deaths occur during the newborn period; this proportion is likely to increase unless the decline in post-neonatal deaths is matched by a similar decline in newborn deaths.

The most recent Saving Babies Report identified the important causes of death in the early neonatal period as immaturity (45%), intrapartum hypoxia (30%), infection (10%) and congenital abnormalities (7%). Intrapartum hypoxia affects mostly larger babies and improvements in maternal care, especially intrapartum monitoring and care, would prevent many of these deaths.¹⁹ Although preterm labour is mostly not preventable, provision of simple standardised care could prevent many of the newborn deaths associated with prematurity.^{20,21}

Stillbirths

The stillbirth rate in SA is estimated to be between 21 and 25 per 1 000 births.²² This is comparable with rates in other middle-income countries, although the intrapartum stillbirth rate is higher than in these countries, which suggests that intrapartum care needs to be improved. A high proportion of both fresh stillbirths (18%) and macerated stillbirths (48%) is unexplained. Antepartum haemorrhage (15%), intrapartum asphyxia and birth trauma (14%), hypertension (13%) and infections (5%) are also important contributors to stillbirths.¹⁹

Table 2: Interventions that are most likely to save the lives of women and children

Continuum of Care	Adolescence & Pre-pregnancy	Pregnancy (Antenatal)	Childbirth	Postnatal (Mother)	Postnatal (Newborn)	Infancy & Childhood
Community Primary Referral	<ul style="list-style-type: none"> Family planning (advice, hormonal and barrier methods) Prevent and manage sexually transmitted infections and HIV Folic acid fortification/supplementation to prevent neural tube defects 	<ul style="list-style-type: none"> Iron and folic acid supplementation Tetanus vaccination Prevention and management of malaria with insecticide-treated nets and antimalarial medicines Prevention and management of sexually transmitted infections (STIs) and HIV, including with antiretroviral medicines Calcium supplementation to prevent hypertension (high blood pressure) Interventions for cessation of smoking 	<ul style="list-style-type: none"> Prophylactic uterotonics to prevent postpartum haemorrhage (excessive bleeding after birth) Manage postpartum haemorrhage using uterine massage and uterotonics Social support during childbirth 	<ul style="list-style-type: none"> Family planning advice and contraceptives Nutrition counselling 	<ul style="list-style-type: none"> Immediate thermal care (to keep the baby warm) Initiation of early breastfeeding (within the first hour) Hygienic cord and skin care 	<ul style="list-style-type: none"> Exclusive breastfeeding for 6 months Continued breastfeeding and complementary feeding from 6 months Prevention and case management of childhood malaria Vitamin A supplementation from 6 months of age Routine immunisation plus <i>H.influenzae</i>, meningococcal, pneumococcal and rotavirus vaccines Management of severe acute malnutrition Case management of childhood pneumonia Case management of diarrhoea
Primary and referral	<ul style="list-style-type: none"> Family planning (hormonal, barrier and selected surgical methods) 	<ul style="list-style-type: none"> Screening for and treatment of syphilis Low dose aspirin to prevent pre-eclampsia Antihypertensive drugs (to treat high blood pressure) Magnesium sulphate for eclampsia Antibiotics for preterm prelabour rupture of membranes Corticosteroids to prevent respiratory distress syndrome in preterm babies Safe abortion Post-abortion care 	<ul style="list-style-type: none"> Active management of third stage of labour (to deliver the placenta) to prevent postpartum haemorrhage (as above plus controlled cord traction) Management of postpartum haemorrhage (as above plus manual removal of placenta) Screen and manage HIV (if not already tested) 	<ul style="list-style-type: none"> Screen for and initiate or continue antiretroviral therapy for HIV Treat maternal anaemia 	<ul style="list-style-type: none"> Neonatal resuscitation with bag and mask (by professional health workers for babies who do not breathe at birth) Kangaroo mother care for preterm (premature) and for less than 2 000g babies Extra support for feeding small and preterm babies Management of newborns with jaundice ('yellow' newborns) Initiate prophylactic antiretroviral therapy for babies exposed to HIV 	<ul style="list-style-type: none"> Comprehensive care of children infected with, or exposed to, HIV
Referral	<ul style="list-style-type: none"> Family planning (surgical methods) 	<ul style="list-style-type: none"> Reduce mal-presentation at term with External Cephalic Version Induction of labour to manage prelabour rupture of membranes at term (initiate labour) 	<ul style="list-style-type: none"> Caesarean section for maternal/foetal indication (to save the life of the mother/baby) Prophylactic antibiotic for Caesarean section Induction of labour for prolonged pregnancy (initiate labour) Management of postpartum haemorrhage (as above plus surgical procedures) 	<ul style="list-style-type: none"> Detect and manage post-partum sepsis (serious infections after birth) 	<ul style="list-style-type: none"> Presumptive antibiotic therapy for newborns at risk of bacterial infection Use of surfactant to prevent respiratory distress syndrome in preterm babies Continuous positive airway pressure (CPAP) to manage babies with respiratory distress syndrome Case management of neonatal sepsis, meningitis and pneumonia 	<ul style="list-style-type: none"> Case management of meningitis

Continuum of Care	Adolescence & Pre-pregnancy	Pregnancy (Antenatal)	Childbirth	Postnatal (Mother)	Postnatal (Newborn)	Infancy & Childhood
Community Strategies	<ul style="list-style-type: none"> • Home visits for women and children across the continuum of care • Women's groups 			<ul style="list-style-type: none"> • Family planning interventions at referral level include those provided at the primary level 		

Source: Partnership for Maternal Newborn and Child Health, 2011.²⁵

Interventions and initiatives to reduce maternal, newborn and child deaths

At an international level, recent efforts to improve maternal, newborn and child survival have focused on ensuring full coverage with packages of interventions with proven effectiveness. It is argued that the key to making progress towards improving maternal, neonatal and child survival is to reach every mother, newborn and child in every district with a set of priority cost-effective interventions.²³⁻²⁵ These packages should be provided through a continuum-of-care approach in order to lower costs, promote greater efficiencies and reduce duplication of resources.²⁶

In order to facilitate decision making in low- and middle-income countries about how to allocate limited resources for maximum impact on the health of women and children, a review of existing evidence about the impact of different interventions on the main causes of maternal, newborn and child deaths was undertaken. The study reviewed more than 50 000 scientific papers to determine the proven effectiveness of interventions and impact on survival, identifying 56 essential interventions that when implemented in packages relevant to local settings are most likely to save lives.²⁵ The proposed interventions and packages are shown in Table 2.

Recognition that progress in reducing childhood deaths has been accompanied by increases in within-country inequities, as evidenced by a widening of the mortality gap between the wealthiest and most deprived quintiles, has highlighted the need to aim specifically at increased coverage among the poorest and most disadvantaged children.²⁷ Modelling undertaken by Carrera et al. suggests that an equity-focused approach that prioritises services for the poorest and most marginalised can be more effective and cost effective than mainstream approaches that incrementally increase population coverage from the easier to the more difficult to reach populations.²⁸ Analysis of data from middle- and low-income countries has demonstrated that those countries with the largest overall coverage with key interventions achieved this coverage primarily through achieving the greatest increase among the poorest quintiles.²⁹

The importance of health system strengthening, of greater accountability (which depends on improved monitoring) and more sustainable financing have also been highlighted.

Key international commitments and strategic documents

Global Strategy for Women's and Children's Health

The Global Strategy for Women's and Children's Health was launched by Ban Ki-moon in 2010 in an effort to mobilise commitments by governments, civil society organisations and development partners to accelerate progress towards achievement of MDGs 4 and 5.¹ The strategy sets out the key areas where action is urgently required to enhance financing, strengthen policy and improve service delivery. These key areas include:

- support for country-led health plans, supported by increased, predictable and sustainable investment;
- integrated delivery of health services and life-saving interventions;
- stronger health systems, with adequate numbers of skilled health workers at their core;
- innovative approaches to financing, product development and the efficient delivery of health services; and
- improved monitoring and evaluation to ensure the accountability of all actors for results.

The Commission on Information and Accountability for Women's and Children's Health

Following the launch of the Global Strategy, the World Health Organization (WHO) was tasked with coordinating a process to determine the most effective international institutional arrangements for global reporting, oversight and accountability on women's and children's health.³⁰ The recommendations of the commission focused on ensuring the availability of "better information for better results". Countries are challenged to improve their systems for recording vital events through the establishment or the strengthening of systems for registration of births, deaths and causes of death, and having well-functioning health information systems that combine data from facilities, administrative sources and surveys. Emphasis is also placed on improving the tracking of resources for women's and children's health and on ensuring better oversight of results and resources both nationally and globally.

A set of 11 health indicators on reproductive, maternal and child health, which are disaggregated for gender and other equity considerations, should be used for the purpose of monitoring progress towards the goals of the Global Strategy. These, together with their preferred source of data, are shown in Table 3.

Table 3: Current primary data sources and preferred data sources for the 11 core indicators of women's and children's health

Indicator	Current Primary Data Source	Preferred Data Source
Maternal mortality ratio	Surveys	Vital registration
Under-five child mortality (with the proportion of newborn deaths)	Surveys	Vital registration
Stunting prevalence	Surveys	Surveys
Demand for family planning satisfied (met need for contraception)	Surveys	Surveys
Antenatal care (four or more visits)	Surveys	Surveys and facility reports
Antiretrovirals for HIV-positive pregnant women*	Facility reports	Facility reports
Skilled attendant at birth	Surveys	Surveys and facility reports
Postnatal care for mothers and babies within two days of birth	Surveys	Surveys and facility reports
Exclusive breastfeeding (0 to 5 months of age)**	Surveys	Surveys
Three doses of combined diphtheria-tetanus-pertussis vaccine (DTP3) immunisation coverage	Surveys and facility reports	Surveys and facility reports
Antibiotic treatment for childhood pneumonia	Surveys	Surveys and facility reports

* This indicator comprises antiretroviral drugs for HIV-positive pregnant women to reduce the risk of mother-to-child transmission of HIV and for their own health.

** Up to the last day of the fifth month of life.

Source: World Health Organization, 2011.³¹

Committing to Child Survival: a Promise Renewed

Led by the United Nations Children's Fund (UNICEF), this strategy aims to revitalise commitment to child survival under the banner of *A Promise Renewed*.³² The strategy, which aims to ensure that under-five mortality rates are below 20 per 1 000 live births in all countries by 2035, focuses on scaling up essential interventions through strengthening of evidence-informed country plans, transparency and mutual accountability, and global communication and social mobilisation.

The strategy focuses on:

- concentrating resources on countries and regions with the most child deaths;
- increasing efforts among high-burden and underserved populations;
- focusing on high-impact solutions by targeting the biggest opportunities for impact – e.g. neonatal conditions – by scaling up and sustaining demand and supply of highest impact and evidence-informed solutions and investing in innovation to accelerate results;
- creating a supportive environment for child survival; and
- fostering mutual accountability by creating transparency and mutual accountability, unifying child survival voices, improving monitoring and evaluating, and sharing knowledge.

Global strategy for elimination of new HIV infections among children

This strategy recognises the synergy between maternal and child health and focuses on accelerating progress towards the elimination of new child infections by 2015.³³ The strategy defines two key targets – namely to reduce the number of new childhood HIV infections by 90% and to reduce the number of HIV-related maternal deaths. Strategies for achieving the first target include reducing the transmission of HIV from a mother to her child, as well

as reducing the HIV incidence in women of reproductive age and increasing the use of family planning services for women living with HIV. Achievement of the second target is dependent on provision of a broader package of HIV and maternal, newborn and child health services.

Key national commitments and interventions

This section provides an overview of important national commitments and strategies that aim to reduce maternal and child mortality.

Negotiated Service Delivery Agreement

NSDA was signed on behalf of the health sector by the Minister of Health in October 2010 and is a contract or "charter that reflects the commitment of key sectoral and intersectoral partners linked to the delivery of identified outputs". The NSDA outlines four key strategic outputs that the health sector must achieve within the next five years. These are:

- Output 1: Increasing life expectancy
- Output 2: Decreasing maternal and child mortality
- Output 3: Combating HIV and AIDS and decreasing the burden of disease from TB
- Output 4: Strengthening health systems effectiveness.³⁴

The NSDA, therefore, places maternal and child mortality and the need to reduce the number of mothers and children who die in SA firmly on the country's agenda and requires that all levels of the health system report on and account for progress or lack thereof.

Establishment of ministerial mortality committees

The establishment of three mortality committees has provided impetus to efforts to address maternal-, perinatal- and child mortality. The National Committee on Confidential Enquiries into Maternal Deaths (NCCEMD), which collects data on all maternal deaths occurring within health facilities in order to monitor trends and address identified deficiencies, was established in 1998. The National Perinatal Mortality and Morbidity Committee (NaPeMMCo) and the Committee on Mortality and Morbidity in Children (CoMMiC) were established in 2008 and do not collect primary data but collate and interpret data regarding mortality rates. All three committees advise the National Department of Health (NDoH) on gaps in service delivery and how these can be addressed.

The recommendations contained in the most recent reports of the three committees are shown in Box 1.

MNCWH and Nutrition Strategic Plan

The country's first MNCWH&N Strategic Plan, launched in 2012, focuses on identifying and strengthening those priority interventions that can be expected to have the greatest impact on reducing maternal, newborn and child mortality.³⁶ These priority interventions are shown in Box 2.

The plan provides a road-map of how these interventions can be effectively implemented. Their focus is on improving coverage, quality and equitable access to this package of core services through the implementation of eight key strategies for achieving improvements in maternal, newborn and child health:

1. Address inequity and social determinants of health.
2. Develop a comprehensive and coordinated framework for MNCWH service delivery.
3. Strengthen community-based MNCWH.
4. Scale up provision of key MNCWH&N interventions at PHC and district levels.
5. Scale up provision of key MNCWH&N interventions at district hospital level.
6. Strengthen the capacity of the health system to support the provision of MNCWH&N services.
7. Strengthen the human resource capacity for the delivery of MNCWH&N services.
8. Strengthen systems for monitoring and evaluation of MNCWH&N interventions and outcomes.

The plan also contains a set of key indicators for monitoring progress in improving maternal and child health outcomes.

The Campaign for Accelerated Reduction in Maternal and Child Mortality in Africa strategy

The Campaign for Accelerated Reduction in Maternal and Child Mortality in Africa (CARMMA) was launched by the Fourth Session of the African Union (AU) Conference of Ministers of Health held in Addis Ababa, Ethiopia in May 2009, under the theme: "Universal Access to Quality Health Services: Improve Maternal, Neonatal and Child Health Mortality in Africa (CARMMA)". The campaign was launched under the slogan "Africa Cares: No Woman Should Die While Giving Life!"³⁷ and focuses on four main areas: building on existing efforts (particularly best practices); generating and providing data on maternal and newborn deaths; mobilising political commitment and support of key stakeholders; and accelerating actions aimed at the reduction of maternal-, infant- and child mortality in Africa.

The campaign was launched in SA in May 2012. The South African campaign focuses on six priorities. These are:

1. Strengthen and promote access to comprehensive sexual and reproductive health services, with a specific focus on family planning services.
2. Promote early antenatal care and attendance of appointments.
3. Improve access to skilled birth attendants by allocating dedicated obstetric ambulances to every sub-district to ensure prompt transfer of women in labour and women with obstetric emergencies to the appropriate level of care. Establish maternity waiting homes.
4. Strengthen human resources for maternal and child health by:
 - providing training on ESMOE to doctors and midwives;
 - intensifying midwifery education and training;
5. Improve child survival by:
 - promoting and supporting exclusive breastfeeding for at least six months;
 - providing facilities for lactating mothers (boarder mothers) in health facilities where children are admitted;
 - promoting Kangaroo Mother Care (KMC) for stable low birth weight (LBW) babies at all levels of care;
 - advocating for appropriate care and support for pregnant women and lactating mothers in the workplace;
 - improving immunisation and vitamin A coverage;
 - intensifying management of severe malnutrition in health facilities;
 - intensifying case management of sick children;
 - improving implementation of key family practices, including diarrhoea management at home;
 - strengthening implementation of IMCI in all PHC facilities;
 - strengthening clinical skills for the management of severe diseases, including pneumonia and diarrhoea in referral facilities;
6. Intensify management of HIV-positive mothers and children by:
 - improving access to treatment for both mothers and children;
 - improving management of co-infections; and
 - eliminating mother-to-child-transmission (MTCT) of HIV.

Box 1: Summary of the recommendations of the three ministerial mortality committees

SAVING MOTHERS 2008-2010: FIFTH REPORT ON THE CONFIDENTIAL ENQUIRIES INTO MATERNAL DEATHS IN SOUTH AFRICA

The committee has summarised its recommendations in five key categories as shown below.¹³

HIV and AIDS

1. Promote the “know your status” and “plan your pregnancy” messages in communities and in the health sector and ensure non-judgemental approaches.
2. Ensure that every maternity facility is able to screen for HIV, perform early initiation of highly active antiretroviral therapy (HAART), and recognise and treat co-infections – especially respiratory infections.

Haemorrhage

3. Promote preventive interventions: provide community education, prevent prolonged labour, prevent anaemia; use safe methods for the induction of labour; and practise active management of the third stage of labour.
4. Severe obstetric haemorrhage must have the status of a ‘major alert’ requiring a team approach and immediate attention must be given to diagnosing the cause of the haemorrhage, resuscitation, and a stepwise approach to arresting the haemorrhage.

Hypertension

5. All maternity facilities must provide calcium supplementation to all women throughout their antenatal care and ensure the detection, early referral and timely delivery of women with hypertension in pregnancy.
6. All maternity facilities must be able to recognise severe hypertension (and related conditions) and provide appropriate management.
7. Promote family planning services in the population at large.

Health worker training

8. Train all healthcare workers involved in maternity care in the Essential Steps in the Management of Obstetric Emergencies – Emergency Obstetric Simulation Training (ESMOE-EOST) programme and obstetric anaesthetic module.
9. Train all healthcare workers who deal with pregnant women in HIV advice, counselling, testing and support (ACTS); initiation of HAART; monitoring of HAART; and the recognition, assessment, diagnosis and treatment of severe respiratory infections.

Health system strengthening

10. Ensure 24-hour access to functioning emergency obstetric care (both basic and comprehensive).
11. Ensure accessible and appropriate contraceptive services for all women, which are integrated into all levels of health care and which must be available on site for women post-miscarriage and postpartum.

NATIONAL PERINATAL MORTALITY AND MORBIDITY COMMITTEE (NAPEMMCO)

The report includes 10 general recommendations, as well as recommendations regarding specific conditions to reduce maternal deaths, stillbirths and newborn deaths. The general recommendations are summarised below.²²

Improving access to appropriate health care

1. Appoint regional clinicians to establish, run and monitor and evaluate outreach programmes for maternal and neonatal health.
2. Improve the transport system for patients and establish referral routes.
3. Government to ensure that constant health messages are conveyed to all and understood by all. This includes community members, patients/clients and healthcare providers.

Improving quality of care

4. Improve the training of healthcare professionals and emphasise maternal and newborn care guidelines during pre-service training and training in clinical skills – especially with regard to training in medical, obstetric and neonatal emergency care, including resuscitation.
5. Follow national maternal and neonatal guidelines in all healthcare facilities.
6. Improve provision and delivery of postnatal care.
7. Normalise HIV as a chronic disease.

Ensuring that adequate resources are available

8. Provide adequate nursing and medical staff and adequate equipment for the health needs of both mothers and babies, especially the equipment required for emergency and critical care.
9. Provide an adequate number of hospital beds for the health needs of mothers and babies at all levels of health care, including critical care beds.

Auditing and monitoring

10. Improve data collection and collation (through the use of standardised registers) and ensure that healthcare workers and managers review and receive feedback regarding their performance.

FIRST REPORT OF THE COMMITTEE ON MORBIDITY AND MORTALITY IN CHILDREN UNDER FIVE YEARS (COMMIC)

The report gives eight key recommendations.³⁵ These are:

1. Develop a national child health strategy.
2. Develop a framework for the delivery of essential healthcare services:
 - develop an essential package of care
 - define norms and standards for child health services
3. Strengthen community-based-care services:
 - give a booklet at the birth of the child that outlines 16 key family practices for child survival
 - implement a community health worker programme
4. Strengthen and complement existing priority child survival programmes:
 - HIV/AIDS – PMTCT and paediatric HAART
 - PHC services – integrated management of childhood illnesses (IMCI), expanded programme on immunisation (EPI), vitamin A supplementation, nutrition and TB and childhood emergencies
 - hospital services – enhance management of common emergencies and foster non-rotation of core staff
5. Strengthen pre-service, postgraduate and in-service training in child health and paediatrics.
6. Institute a system of geographically defined and population-focused child health coordination and support by specially trained paediatricians or child health workers.
7. Strengthen essential data systems: including vital registration; the District Health Information System (DHIS); the Demographic Health Survey (DHS); Child Healthcare Problem Identification Programme (Child PIP); and the Road to Health booklet.
8. Identify key drivers to sustain the actions required to improve the health of children across the country:
 - establish district child health forums
 - establish provincial child health forums

Sources: National Committee for Confidential Enquiries into Maternal Deaths, 2012;¹³ National Perinatal Mortality and Morbidity Committee, 2012;²² Committee on Mortality and Morbidity in Children, 2012.³⁵

The Tshwane Declaration: promoting exclusive breastfeeding

In response to the 2010 WHO guidelines on HIV and infant feeding,³⁸ which re-established promotion of breastfeeding as a key child survival strategy, a national breastfeeding consultative meeting was convened in August 2011. The meeting concluded with the Tshwane Declaration of Support for Breastfeeding, which declared SA to be a country that actively promotes, protects and supports exclusive breastfeeding as the infant feeding option of choice, irrespective of the mother's HIV status.

The declaration recommended the following additional actions:

- National Regulations on the International Code on Marketing of Breast Milk substitutes are finalised, adopted into legislation within 12 months, fully implemented and the outcomes monitored.
- Legislation regarding maternity among working mothers is reviewed in order to protect and extend maternity leave. Measures are to be implemented to ensure that all workers, including domestic and farm workers, benefit from maternity protection.
- Comprehensive services are to be provided to ensure that all mothers are supported to breastfeed their infants exclusively for six months and, thereafter, to give appropriate complementary foods and continue breastfeeding up to two years of age and beyond.
- Human milk banks are promoted and supported as an effective approach, especially in post-natal wards and neonatal intensive care units, to reduce early neonatal and post-natal morbidity and mortality for babies who cannot breastfeed.
- Implementation of the Mother and Baby Friendly Health Initiative (MBFHI) and KMC are mandated such that all public hospitals and health facilities are MBFHI accredited by 2015. All private hospitals and health facilities should be partnered to be MBFHI accredited by 2015.
- Communities are supported to be 'baby friendly' and community-based interventions and support are implemented as part of the continuum of care, with facility-based services to promote, protect and support breastfeeding.
- Continued research, monitoring and evaluation should inform policy development and strengthen implementation.
- Formula feeds will no longer be provided at public health facilities, except on prescription by appropriate healthcare professionals for mothers, infants and children with approved medical conditions.

National HIV and AIDS and STI Strategic Plan

In line with international trends, the National HIV and AIDS and STI Strategic Plan (NSP) explicitly links efforts to reduce mortality and morbidity associated with HIV infection with efforts to improve maternal and child health.³⁹ The NSP aims to reduce MTCT to less than 2% at six weeks after birth and less than 5% at 18 months by 2016. The plan recognises that this will require strengthening the management, leadership and coordination of the PMTCT programme and ensuring its integration with maternal and child health programmes.

The NSP has identified four strategic objectives to reach its five-year goals. These are:

- address social and structural factors that influence the three diseases;
- prevent new HIV, TB and STI infections;
- sustain health and wellness by:
 - ensuring access to quality treatment, care and support services for those with HIV, STIs and/or TB;
 - supporting people so that they stay on treatment and developing programmes that focus on wellness;
 - improving community-level PHC, number of treatment centres and specialist referral for difficult cases; and
- protect rights of people living with HIV by working to end stigma, discrimination, human rights violations and gender inequality.

National Early Childhood Development strategy

It is increasingly recognised that early childhood – especially between birth and two years of age – represents a critical window of opportunity to shape the long-term physical, cognitive and emotional health and development of children and that the best way to give children the best start in life is through an integrated approach to early childhood development (ECD).⁴⁰

As the first step in developing a new ECD strategy for the country, a Diagnostic Review of Early Childhood Development was undertaken in 2012. The review found that many elements of comprehensive ECD support and services were already in place and that some aspects of basic services provision were assessed as performing well; these include birth registration, social security, health care for women and children, early child care and education, and preparation for formal schooling.⁴¹

Important needs highlighted in the review included: support for parenting, prevention of stunting among young children, safe and affordable child care for very young children and for families needing assistance, and access to services for the most at-need families and children with disabilities.

The Buffalo City Declaration, which emanated from the National ECD Conference held in September 2012, called for:

- a comprehensive review and harmonisation of policy and legislation within the ECD sector moving towards universal access;
- a multisectoral, integrated, coordinated approach to the effective provisioning of ECD services by government, non-governmental organisations, civil society and business;
- strengthening the role of parents and caregivers, families and communities in the provisioning of ECD services;
- deliberately extending ECD services to include children with special needs and children in rural areas; and
- adequate resourcing of ECD services, including infrastructure provisioning.⁴²

Health systems strengthening and PHC re-engineering

Delivery of comprehensive, quality MNCWH&N services depends on a well-functioning health system. Deficiencies in the quality of maternal and child health services have been extensively documented and gains in maternal and child health are unlikely to be achieved in the absence of improved service delivery. This will require substantial investment in human resources to ensure improved availability, skills and motivation of healthcare workers who provide maternal and child health services at community, PHC and hospital levels.¹⁶

Government initiatives to improve the noted deficiencies include the introduction of the National Health Insurance, introduction of national core standards and PHC re-engineering. PHC re-engineering specifically aims to improve maternal and child outcomes and is, therefore, described in more detail below.

Establishment of ward-based PHC outreach teams

The ward-based PHC outreach teams which are based on the model used to improve health outcomes in Brazil will play an important role in delivering community-based MNCWH&N promotion and other services to communities and households, and will facilitate access to routine and curative health and other services where these are required. Each team should consist of a team leader (professional or enrolled nurse) and four to five community health workers. They will be expected to provide services to approximately 7 500 households. In the long term, teams are expected to cover all of the 4 227 wards.⁴³

Establishment of district clinical specialist teams

District clinical specialist teams will be made up of an obstetrician, a paediatrician, a family physician, an anaesthetist, an advanced midwife, an advanced paediatric nurse and a PHC nurse.⁴⁴ The teams will be tasked with improving clinical governance in the districts in which they are deployed. They will, therefore, play a key role in ensuring the provision of quality MNCWH&N Strategic Plan services at all levels within the district. Particular attention will be paid to ensuring supervision and support of MNCWH&N Strategic Plan services at district hospital level.

Expansion and strengthening of school health services

Strengthening school health services will contribute towards improved health and learning outcomes for children and youth. The new Integrated School Health Programme (ISHP) aims to build on and strengthen existing school health services, although with some important changes. These include:⁴⁵

- a commitment to close collaboration between all role players, with the Departments of Health and Basic Education taking joint responsibility for ensuring that the ISHP reaches all learners in all schools;
- provision of services to learners in all educational phases;
- provision of a more comprehensive service, which addresses not only barriers to learning but also other conditions that contribute to morbidity and mortality among learners during both child- and adulthood;

- more emphasis on provision of health services in schools, with a commitment to expanding the range of services over time; and
- a more systematic approach to implementation. The phased approach (as outlined in the 2003 school health policy), which focused on district-level implementation, did not translate into adequate coverage at sub-district, school and learner levels.⁴⁶ Although the ISHP will initially target the most disadvantaged schools, sequenced plans for progressive coverage aim to ensure that all learners are reached.

The ISHP aims to ensure that this package of services is provided for all learners by 2016.

Progress in implementing key interventions and programmes

Sustaining reductions in maternal and child mortality depends on translating the commitments and strategies outlined above into workable programmes and services that can achieve and sustain high coverage. This section focuses on the package of priority maternal and child health interventions as outlined in the national MNCWH&N (see Box 2). These packages include all of the 56 essential interventions outlined in Box 1, although calcium supplementation to prevent hypertension for all pregnant women has not been widely implemented and surfactant is generally not available at district hospital level.

Box 2: Package of priority maternal- and child-health interventions as outlined in the National MNCWH&N Strategic Plan

<p>Maternal health</p> <ul style="list-style-type: none"> ❖ basic antenatal care (BANC); ❖ HIV testing during pregnancy, with initiation of ART and provision of other PMTCT services where indicated; ❖ improved access to care during labour through introduction of dedicated obstetric ambulances and establishment of maternity waiting homes (where appropriate); ❖ improved intrapartum care; and ❖ post-natal care within six days of delivery. <p>Newborn health</p> <ul style="list-style-type: none"> ❖ promotion of early and exclusive breastfeeding, ensuring that breastfeeding is made as safe as possible for HIV-exposed infants; ❖ provision of PMTCT; ❖ resuscitation of newborns; ❖ care for small/ill newborns according to standardised protocols; ❖ KMC for stable LBW infants; and ❖ post-natal visit within six days, which includes newborn care and helping mothers to practise exclusive breastfeeding. <p>Child health</p> <ul style="list-style-type: none"> ❖ promotion of breastfeeding and appropriate complementary feeding practices for infants and young children; ❖ provision of preventative services. These include: immunisation, growth monitoring and promotion, vitamin A supplementation and regular deworming; ❖ correct management of common childhood illnesses using the IMCI case management process (including early identification and management of children with HIV and TB); ❖ early identification of HIV-infected children and appropriate management (which includes initiation of ART where indicated); ❖ improved hospital care for ill children, especially for those with common conditions (pneumonia, diarrhoea and severe malnutrition), using standardised protocols; ❖ expansion and strengthening of school health services; and ❖ developing services for children with long-term health conditions. <p>Community interventions</p> <ul style="list-style-type: none"> ❖ provision of a package of community-based MNCWH&N Strategic Plan services by generalist community health workers working as part of ward-based PHC outreach teams; ❖ multi-sectoral action to reduce poverty and inequity, and improve access to basic services, especially improved water and sanitation; and ❖ development of an MNCWH&N Strategic Plan communication strategy.

Source: National Department of Health, 2012.³⁶

Data from the DHIS and other sources are used to assess progress regarding implementation, while ongoing challenges and their possible solutions are highlighted.

Maternal health care

Antenatal care

Antenatal care (ANC) should be provided through the Basic Antenatal Care (BANC) approach, which has been shown to be as effective as more traditional antenatal care models in terms of maternal and perinatal outcomes, as well as acceptable to users.⁴⁷ The BANC approach requires that every woman attends ANC at least four times during her pregnancy, starting in the first trimester. Early attendance is particularly important, given that the current PMTCT guidelines recommend that ART be commenced at 14 weeks' gestation in eligible women. The approach also emphasises promotion of healthy behaviours (such as adequate nutrition and moderate exercise, safe sex and smoking and alcohol avoidance and cessation), and identifies and refers women with high-risk pregnancies.

As shown in Table 4 although DHIS data for 2011 show that ANC coverage was above 100%, only 40% of pregnant women attended ANC before 20 weeks gestation and only four provinces achieved an average of four visits per antenatal client. HIV counselling and testing rates were reported to have attained full coverage, although retesting rates (at 32 weeks) were far lower. ART initiation rates reflect the proportion of eligible pregnant women who were initiated on ART. While this rate has increased over time, the low rates in some provinces (i.e. Northern Cape and Free State) are of concern.⁴⁸ From April 2013, all HIV-infected pregnant and breastfeeding women will be eligible to receive ART.

Table 4: ANC and PMTCT coverage indicators, 2011

	ANC coverage %	ANC coverage before 20 weeks %	Average no. of ANC visits per ANC client	ANC clients who tested for HIV (first test) %	ANC clients who tested for HIV (second test 32 weeks) %	Eligible ANC clients who were initiated on HAART %
Eastern Cape	99.7	33.0	3.0	95.4	33.4	71.1
Free State	86.1	46.3	4.3	96.8	45.1	62.6
Gauteng	117.0	34.4	3.7	88.3	50.5	77.9
KwaZulu-Natal	93.8	40.2	4.4	110.1	36.7	90.0
Limpopo	113.7	41.6	3.5	102.7	44.3	75.4
Mpumalanga	99.3	37.8	3.5	111.2	32.6	65.7
North West	100.3	41.9	3.6	107.8	38.3	71.7
Northern Cape	95.1	52.4	4.5	99.8	42.2	52.3
Western Cape	81.7	55.6	4.5	91.4	35.6	99.5
South Africa	100.6	39.9	3.0	99.3	40.3	78.7

Source: National Department of Health, 2012.⁴⁸

Intrapartum care

Although 90% of women deliver in facilities (see Table 5), it is postulated that many women do not reach hospital during labour or present late in labour primarily due to difficulties related to accessing transport after the onset of labour. This issue is addressed specifically in the CARMMA strategy through the introduction of dedicated obstetric ambulances and the establishment of maternity waiting homes. PHC outreach team members will also play an important role in ensuring that expectant mothers are assisted to develop birthing plans.

However, late presentation is not the only factor in high levels of maternal mortality and morbidity. The ESMOE is a practical modular training programme, which has been shown to result in a significant improvement of interns' knowledge and skills. It is currently being scaled-up with all healthcare workers that supervise deliveries at all levels of care, being targeted for training.⁴⁹

Table 5: Intrapartum and post-partum care, 2011

	Deliveries occurring in facilities %	Women who receive post-natal care within 6 days of delivery %
Eastern Cape	81.8	44.1
Free State	79.1	79.7
Gauteng	97.3	64.2
KwaZulu-Natal	83.3	55.7
Limpopo	113.1	64.5
Mpumalanga	89.3	40.0
North West	83.9	75.5
Northern Cape	89.4	38.0
Western Cape	84.8	Does not report
South Africa	89.7	52.5

Source: National Department of Health, 2012.⁴⁸

Post-natal care

The lack of provision of post-natal care has been identified as a gap in the continuum of care both internationally and in SA.⁵⁰ Post-natal care visits can play an important role in providing care to the mother and newborn, especially by helping mothers to practise exclusive breastfeeding and by ensuring that the mother/infant pair receives the post-natal component of PMTCT. The National Maternity Care Guidelines prescribe that these visits should be made at six hours, at six days and at six weeks after delivery.⁵¹ Reported coverage of post-natal care within six days of delivery has increased substantially, from a national figure of 4.8% in 2009 to 52.5% in 2011.⁴⁸ However, considerable variation in coverage between provinces (shown in Table 5) persists.

Newborn care

The newborn care package outlined in the MNCWH&N Strategic Plan aims both to prevent deaths by targeting the leading causes of death during the newborn period and to promote PMTCT and exclusive breastfeeding – two interventions that have important implications for improving survival and health throughout infancy and childhood. Data on perinatal mortality rates provide an indication of the quality and coverage of newborn care, although provincial rates hide wide intra-provincial variation.⁴⁸

Table 6: Perinatal mortality rate, 2011

	Perinatal Mortality (deaths per 1 000 deliveries)
Eastern Cape	37.1
Free State	41.0
Gauteng	30.9
KwaZulu-Natal	31.6
Limpopo	32.3
Mpumalanga	33.6
North West	35.4
Northern Cape	36.9
Western Cape	23.1
South Africa	32.4

Source: National Department of Health, 2012.⁴⁸

Preventing deaths: caring for sick and small newborns

Complications related to prematurity and LBW are the leading cause of death in newborn babies. Mortality rates for small newborns are high in district hospitals when compared with those in regional tertiary and central hospitals – notwithstanding that most small infants are cared for in district hospitals.²²

Studies have shown that provision of KMC to stable small newborns where the baby is carried on the front of the mother's chest (with direct skin-to-skin contact) is an effective and safe way of caring for these babies. Data collected through perinatal mortality audits have shown that public hospitals that have implemented KMC have reduced their mortality rates among small babies (weighing between 1 kg and 2 kg) by 30%.⁵² KMC is an important component of the CARMMA strategy and should be implemented in all facilities that provide newborn care.

Most neonatal deaths in large babies result from asphyxia. Improvements in intrapartum care and emergency management can be expected to prevent many of these deaths. All healthcare workers who deliver babies should be able to recognise promptly those newborns that require resuscitation and start resuscitation immediately.

Prevention of Mother-to-Child Transmission

As outlined above, the NSP aims to reduce MTCT to less than 2% at six weeks after birth and less than 5% at 18 months by 2016.³⁹ The 2011 PMTCT Effectiveness Study found the national MTCT transmission rate to be 2.7% among HIV-exposed infants that attended a representative sample of PHC facilities for their six-week immunisation.⁵³ This is compared with a figure of 3.5% for 2010 and of 8% for 2008.⁵⁴ Figures for transmission rates at 18 months are less certain, as a result of low routine-testing coverage and challenges in following up infants, even in research settings.

Critical actions that facilitated the improvement in the PMTCT programme outcomes included: rapid implementation of changes in PMTCT policy at the field level through training and guideline dissemination; ensuring good coordination with technical partners, such as international health agencies and international and local non-governmental organisations and making use of data on and

indicators of all aspects of the PMTCT programme. Enabling healthcare staff at primary care facilities to initiate ART and expanding laboratory services for measuring CD4 T-cell counts and for polymerase chain reaction (PCR) testing were also identified as factors that facilitated improvements.⁵⁵

Exclusive breastfeeding

Exclusive breastfeeding is recognised as being the single most effective intervention for reducing under-five mortality in low-income settings.⁵⁶ SA has experienced the erosion of its breastfeeding culture over the past years due to among other reasons, aggressive marketing of breast milk substitutes by the infant feeding industry and a lack of clarity regarding optimal infant feeding practices in the context of HIV and AIDS. Studies have reported that between 8% and 25.7% of children aged 0 to 6 months were exclusively breastfeeding,^{57,58} while breastfeeding practices have proven resistant to interventions (such as a programme of home visitation in addition to routine facility infant feeding counselling), which have proved more successful in other settings.⁵⁹

Implementation of the Tshwane Declaration is, therefore, a priority. Regulations regarding infant feeding, which are in line with the international Code on Marketing of Breast Milk Substitutes, were gazetted in December 2012, and breastmilk substitutes (formula) are no longer provided at public health facilities (except for approved medical conditions). Progress with regard to ensuring that all mothers are supported to breastfeed their infants is less certain, and is likely to require sustained attention and effort.

Child health

As outlined above, child mortality rates have shown a rapid decline in recent years, primarily as a result of the decline in the HIV burden in children. This provides an opportunity to address other important child health issues that have tended to be neglected in the past.

Optimal nutrition and ECD

Undernutrition remains an important problem for children in SA. The 2005 National Food Consumption Survey found that 18% of children were stunted, 9.3% were underweight and 4.5% were wasted.⁶⁰ Levels for all three indices were higher in young children (one to three years) than in older children (seven to nine years). Stunting was higher in children living in rural farming areas (24.5%), tribal areas (19.5%) and urban informal areas (18.5%). Micronutrient deficiencies were also documented.

The ECD strategic review specified that reductions in the prevalence of stunting should be one of the key components of ECD interventions. PHC outreach teams will be well placed to ensure that caregivers are supported to feed their children optimally and that growth faltering is identified, corrected and managed. It is important that this is recognised and protected as one of their key roles.

Ensuring full coverage of preventive health services

Ensuring full coverage of preventive services, which include immunisation, growth monitoring and promotion, vitamin A supplementation and regular deworming, is a key component of ensuring the optimal health and development of all children. In order for this goal to be achieved, children need to access PHC services on a regular basis. The average number of visits to PHC facilities for children under-five has remained fairly stable in the past few years (increasing from 4.3 in 2008 to 4.6 in 2011). However, there is considerable variation between provinces, with children in the Free State only visiting health facilities an average of 3.6 times in 2011.⁴⁸

Immunisation rates remain relatively high, although the low rates in Mpumalanga, North West and Eastern Cape are of concern. Discrepancies between DHIS figures and figures obtained through population-based surveys are also apparent and efforts are underway to understand and address these discrepancies.

Ensuring that children aged one to five receive vitamin A supplementation remains a challenge. PHC outreach teams are expected to play an important role in ensuring that children receive preventive services, including early identification of growth faltering and undernutrition.

Prevention and treatment of common illnesses

Pneumonia and diarrhoea remain the leading causes of death in children outside of the newborn period. DHIS data on these two conditions are shown in Table 8. These figures represent routine data from facilities; this means that variations in reported incidence may reflect access to health services and differences in case identification rather than real differences in the burden of disease.

Data on the proportion of children that receive the correct treatment, i.e. oral rehydration for diarrhoea and antibiotics for pneumonia, can only be accurately collected through population-based surveys.

Table 7: PHC utilisation and coverage with key preventive interventions, 2011

	Average no. of PHC visits for children under five years of age	Children who are fully immunised by one year of age,%	Vitamin A Coverage amongst children one to five years of age %
Eastern Cape	4.5	81.5	43.1
Free State	3.6	90.8	45.2
Gauteng	4.1	115.4	46.2
KwaZulu-Natal	4.5	97.0	40.0
Limpopo	6.3	95.9	44.6
Mpumalanga	4.8	71.9	37.5
North West	4.3	81.5	33.8
Northern Cape	4.6	94.1	30.5
Western Cape	4.8	88.7	37.7
Total	4.6	94.2	41.4

Source: National Department of Health, 2012.⁴⁸

The 2003 DHS showed that health care was sought for two-thirds of the children that were sick with a cough or fever, while 63% of children with diarrhoea received oral rehydration solution or sugar salt solution.⁵⁷ There is an urgent need to ensure that more recent data are available for these indicators.

Management of HIV infection

An estimated 450 000 children under 15 years of age were living with HIV in SA, and HIV infection is a contributing factor in between 30% and 60% of child deaths.^{18,61} The 2010 HIV guidelines include the provision of ART for all HIV-infected infants and this has recently been extended to cover all children under five. ART should be provided at all PHC facilities as part of the routine management of young children, using the IMCI case management guidelines. The number of children receiving ART has increased, with 40 000

Table 8: Diarrhoea and pneumonia in children under five years of age: incidence, admissions, deaths and case fatality rates, 2011

	Incidence of diarrhoea with dehydration (cases per 1 000 children under five years of age)	Admissions for diarrhoea (per 1 000 children under five years of age)	Case fatality rate %	Incidence of pneumonia (cases per 1 000 children under five years of age)	Admissions for pneumonia (cases per 1 000 children under five years of age)	Case fatality rate %
Eastern Cape	12.5	7.6	8.3	59.5	9.1	5.2
Free State	7.2	7.7	8.2	94.0	9.2	7.0
Gauteng	13.9	3.1	5.0	57.3	5.3	4.2
KwaZulu-Natal	22.7	7.4	5.0	155.0	9.0	3.8
Limpopo	16.2	5.7	9.0	55.1	10.1	5.8
Mpumalanga	9.3	4.8	9.9	42.7	6.8	8.3
North West	10.8	8.3	4.9	76.7	9.0	5.1
Northern Cape	11.9	16.9	3.7	95.8	15.1	3.0
Western Cape	16.7	14.3	0.2	72.0	13.6	0.4
South Africa	15.2	7.2	5.2	84	8.9	4.3

Source: National Department of Health, 2012.⁴⁸

children (under 15 years of age) being initiated on ART during 2011.⁶² However, significant challenges remain in ensuring that all eligible children are initiated on ART as early as possible and that systems for tracking progress in initiating and maintaining children on ART are strengthened.

Hospital care

Strategies for monitoring and improving the care that children receive in public hospitals have not been implemented on a large scale. This has resulted in a wide variation in the quality of care provided in different hospitals. DHIS data reveal enormous variation with regard to child mortality rates (see Table 9) and mortality audits continue to identify many modifiable factors that have or may have contributed to the deaths of children in hospitals.

Table 9: In-hospital fatality rates for children, 2011

	In-hospital fatality rate children under one year %	In-hospital fatality rate children under five years %
Eastern Cape	7.2	5.8
Free State	10.2	8.4
Gauteng	7.2	2.5
KwaZulu-Natal	7.0	5.2
Limpopo	10.9	6.8
Mpumalanga	9.7	6.3
Northern Cape	8.5	6.1
North West	6.9	5.3
Western Cape	2.8	1.8
South Africa	6.9	4.5

Source: National Department of Health, 2012.⁴⁸

Data from hospital audits undertaken between 2005 and 2009 also highlight deficiencies in the quality of emergency care, with more than one-third of deaths occurring within 24 hours of admission and a disproportionate number of modifiable factors occurring in the emergency care setting. Assessment and management of children in this setting appeared to be a particular problem, and highlights the need for the introduction of a standard approach to the provision of emergency care.¹⁸

The establishment of district clinical specialist teams provides an important opportunity for improving the quality of care at regional and district hospital levels. The teams will be expected to ensure that appropriate guidelines and protocols are available and that healthcare workers are appropriately trained and supported to provide high-quality services.

Children with long-term health conditions

Services for ensuring that children with long-term health conditions and disabilities receive the care that they deserve are lacking.⁶³ International data indicate that 15% to 20% of children are affected by a chronic or long-term health condition. These include a range of congenital and acquired conditions, which include medical conditions (such as asthma and rheumatic heart disease), developmental delay and disabilities.

Conclusions and recommendations

Despite recent progress, SA continues to face a high burden of disease and high maternal and child mortality rates. Reducing maternal and child deaths has been included as one of the four strategic outputs of the NSDA. This means that all levels of the health system are required to report on progress in reducing these rates. This requirement has not only increased accountability but has provided impetus to efforts to improve the health of mothers and children.

At a global level, ensuring provision of evidence-informed packages of care to all women and children continues to be regarded as the key to improving maternal and child health. Strengthening the health system, addressing equity and increasing accountability play a parallel role. In SA, the packages of maternal and child health services, as outlined in the MNCWH&N Strategic Plan, are in line with those interventions that have been identified as most likely to save the lives of women and children. However, weaknesses and inefficiencies in the health system will need to be addressed if current gains are to be maintained and accelerated and the potential benefits of PHC restructuring and other efforts to improve maternal and child health are to be realised. International experience also suggests that gains in combatting child mortality will stall unless issues related to equity are dealt with more explicitly through reaching the most disadvantaged communities.

The MNCWH&N Strategic Plan, together with the CARMMA strategy, recommendations from the three ministerial mortality committees and other key documents, provide SA with a detailed road-map for improving maternal, newborn and child health. Efforts to improve maternal and child health should, therefore, focus on ensuring that all the components of the plan are implemented. These should include those components that address the strengthening of health system supports and human resources.

Priority actions include:

- Ensure the availability of adequate numbers of well-trained healthcare workers at facility and community levels. District clinical specialist teams and PHC outreach teams represent a valuable human resource at community and district levels; systems will need to be in place to ensure that these teams identify and address key barriers to the provision of MNCH services at household, community and facility levels. It will be particularly important to ensure that PHC outreach team members are not overloaded with too many tasks and to ensure that provision of maternal and child health services remains one of their core tasks.
- Strengthen systems for monitoring and evaluation to improve planning and service delivery and encourage greater accountability. This includes:
 - strengthening the use of routinely collected data at national, provincial and local levels;
 - improving the availability of population-based data on health status and outcomes and on coverage with key interventions. Such surveys need to collect data regarding socio-economic indicators to measure coverage and other gaps between different wealth quintiles and groups with other socio-economic and educational characteristics;

- expanding and institutionalising mortality audits as these have been effective in identifying deficiencies in care and galvanising action to improve service delivery;
- Monitor and address issues related to inequity more explicitly. Although this is included in the strategic plan, the strategies and interventions through which this will be achieved need to be more clearly defined.
- Prioritise current efforts to improve management of HIV infection and of obstetric emergencies as these services have the greatest potential to improve maternal survival.
- Address newborn mortality needs in a systematic manner. In addition to improving maternal care, all hospitals should provide a package of care to newborns, which includes provision of routine care (including breastfeeding support and PMTCT), neonatal, resuscitation, special care for small/sick newborns and KMC. As outlined in the NaPeMMCo recommendations, this will require improvements in access to appropriate care and in the quality of care, as well as ensuring that adequate resources are available and that auditing and monitoring are strengthened.
- As mortality from HIV infection in children declines, pay more attention to addressing other conditions and to ensuring optimal development of all children. These include:
 - ensuring that undernutrition in children is addressed in a systematic way. This needs to form a key component of a comprehensive package of ECD interventions, which include promotion of breastfeeding and ensuring that children access all routine preventive and promotive health services;
 - improving the quality of care that children receive in hospital. Emergency care needs to be improved as well as care for common conditions, especially diarrhoea, pneumonia, malnutrition and HIV infection; and
 - improving services for children with long-term health conditions, including disability.

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Occupational Health Challenges Facing the Department of Health: Protecting employees against tuberculosis and caring for former mineworkers with occupational health disease

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This chapter reviews two occupational populations for which the South African Department of Health has legal responsibilities, although in different ways. These are healthcare workers at risk of tuberculosis, to which the Department has responsibilities as an employer, and former mineworkers with occupational lung disease, to which the Department has legal responsibilities for examination and compensation under the Occupational Diseases in Mines and Works Act (ODMWA). Both of these mandates have implications for the healthcare system in South Africa.

Healthcare workers, who are increasing in number in the South African workforce, are at risk of tuberculosis from their occupational activity and from exposure as members of communities with a high HIV and tuberculosis disease burden. Local epidemiologic studies are limited, but suggest rising occupational risk, which includes the risk of contracting multidrug-resistant tuberculosis. One such study is a provincial audit of administrative compliance with occupational health and safety requirements relevant to the protection of staff from tuberculosis in the Western Cape. This audit has revealed substantial gaps.

Besides infection control and prevention measures, protection of healthcare workers requires an integrated management system that incorporates commitment from top management; comprehensive, locally appropriate and practicable policies; appropriate training; continued surveillance; and the provision of comprehensive occupational health services to healthcare workers.

Among the growing population of former mineworkers, the Department of Health has major shortcomings in fulfilling its legal mandate of providing statutory medical examinations (in addition to the treatment of tuberculosis and HIV-related disease in all public healthcare facilities). The Department is also failing to adjudicate and arrange for the payment of compensation to workers with occupational lung disease. Legal, financial and managerial reform of the ODMWA system is required.

Healthcare workers, who are increasing in number in the South African workforce, are at risk of tuberculosis from their occupational activity and from exposure as members of communities with a high HIV and tuberculosis disease burden. In addition, the Department of Health has a statutory obligation to provide for free medical examinations and timeous compensation for former mineworkers, a large population with a high burden of silicosis, tuberculosis and HIV infection.

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Introduction

This chapter focuses on two growing problems facing the South African health system and specifically the Department of Health. The first problem is tuberculosis (TB), which includes multidrug-resistant tuberculosis (MDR-TB), among healthcare workers. The second is the failure of the statutory examination and compensation system for occupational lung disease among former mineworkers.

In response to the first of these problems, the state's responsibility is primarily that of employer and its responsibilities are those conferred by the doctrine of duty of care, national policy and occupational health and safety legislation. In the second, the state's responsibility is a historical one defined by statute. The occupational contexts are different. In the case of healthcare workers the context is caring for infected patients; in the case of mineworkers the context is exposure to hazardous dust. However, the HIV and TB epidemic is common to both.

Both challenges provide case studies of the functioning of the occupational health and safety dispensation in South Africa. Both also have implications for the functioning of the public healthcare system. It is contended that properly addressing the occupational health needs of healthcare workers; i.e., "caring for the carer", will positively affect the quality of care that public sector staff provide to clients. In the case of former mineworkers, while the burden of lung disease has been 'externalised' from the industry to the public healthcare system, it is a matter of social justice that the historical contract between mineworkers and the state be upheld. This does not preclude continued efforts aimed at the prevention of disease being firmly rooted in changed industry practices.

Employment in health care and mining

The characteristics of the South African working population have changed in the past eight years. The community, social and personal services sector, the second-largest sector, constitutes an increasing proportion of the total labour force. In contrast the mining population as a percentage of the total labour force has remained static over this period. (See Table 1) The healthcare workforce comprises a large proportion of the community, social and personal services sector, with the state being the major employer at the national, provincial and local levels. In contrast, the private sector is the major employer of workers in the mining industry.

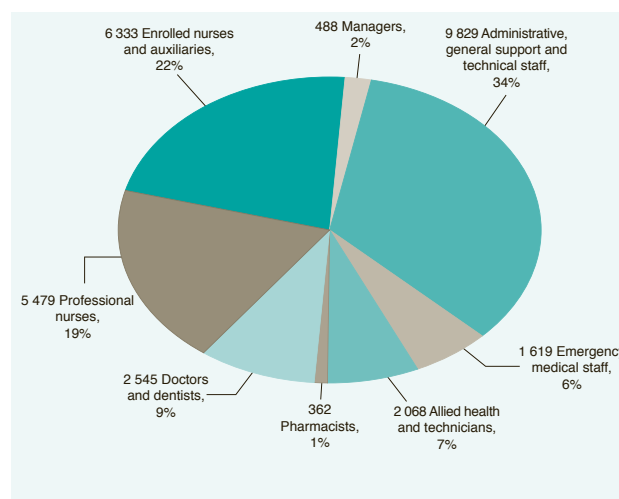
Healthcare workers

Since 2004, the number of health professionals in the public sector has grown, with a considerable increase of 153 383 to 210 511 between 2004 and 2010 reported. This increase has been mainly in the nursing category.³ The distribution of the healthcare workforce in a province, with the Western Cape as an example, is outlined in Figure 1. More than 60% of the workforce is engaged in providing healthcare services to patients, which exposes them directly to occupational risks associated with patient care. Nursing staff comprise the biggest such category (41%). The introduction of National Health Insurance (NHI) will most likely result in a further expansion of this workforce.³

Mineworkers

Although the proportion of mineworkers as a part of the total non-agricultural labour force has remained more or less constant, the number of employees in the mining sector also increased between 2002 and 2012. (See Table 1) In 2011, platinum group metals (38%), gold (28%) and coal (15%) were the dominant employment sectors by commodity, as outlined in Figure 2 and Table 2. A striking feature, however, is the decline of gold mining employment relative to platinum, iron ore and coal. This has implications for the risk of occupational lung disease, as the platinum, iron ore and coal sectors carry lower silicosis risks than gold mining, which has historically been responsible for the major occupational lung disease burden in the mining industry.

Figure 1: Employment distribution pattern of the healthcare workforce in Western Cape Department of Health, 2010/11 (n=28 500)



Source: Western Cape Department of Health, 2011.⁴

Table 1: Trends in the distribution of employment in the community, social and personal services and mining and quarrying sectors in SA, 2004-2012

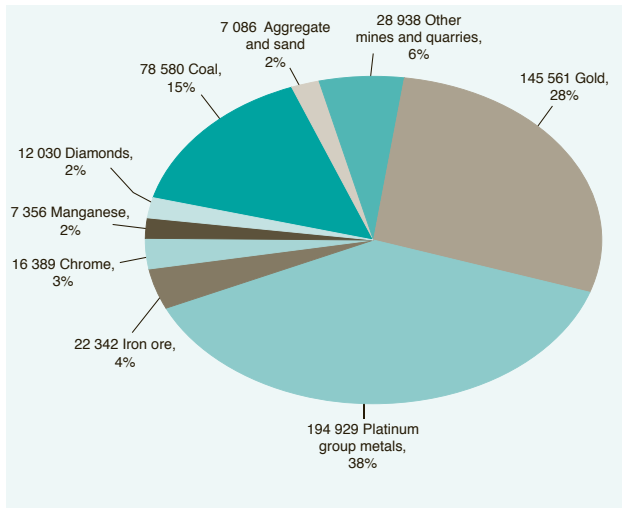
Industry	Total no. of employees x 10 ³ (% of total of all formal non-agricultural industries)							
	Dec 2004		June 2006		June 2009		June 2012	
	No. (x 10 ³)	(%)	No. (x 10 ³)	(%)	No. (x 10 ³)	(%)	No. (x 10 ³)	(%)
Community, social and personal services	1 782	25.0	2 001	27.4	2 180	26.4	2 358	28.0
Mining and quarrying	456	6.4	459	6.3	492	6.0	533	6.3

Source: Statistics South Africa, 2012; 2006.^{1,2}

Table 2: Mining employment trends (numbers) by commodity, 2002-2011

Commodity	2002	2006	2011
Gold	199 378	159 782	145 561
Platinum group metals	111 419	168 530	194 929
Iron ore	5 389	8 859	22 342
Copper	5 107	3 993	N/A
Chrome	5 404	7 899	16 389
Manganese	2 581	3 332	7 356
Diamonds	16 346	19 686	12 030
Coal	47 469	57 778	78 580
Aggregate and sand	3 220	5 133	7 086
Other mines and quarries	19 675	21 345	28 938
Total	415 988	456 337	513 211

Source: Chamber of Mines, 2012.⁵

Figure 2: Mining employment distribution by commodity, 2011

Source: Chamber of Mines, 2012.⁵

Tuberculosis in healthcare workers

SA is currently ranked third among the high TB burden countries, with an estimated 0.40 to 0.59 million incident cases in 2010, and is outranked only by India and China.⁶ While all of the high burden countries have demonstrated declines or stabilisation in their incident rates, SA has shown an increasing trend in new cases, with the latest TB incidence estimated to be 1 170 per 100 000 of the population. The importance of HIV infection as a risk factor is underscored by the latest estimate of a 60% HIV prevalence among incident TB cases in SA.

Within this context, this review covers the epidemiology of TB risk in healthcare workers in SA and the regulatory and management frameworks applicable for ensuring their occupational health and well-being. Findings from an audit conducted to evaluate health and safety policy and practice in Western Cape Department of Health facilities are presented to illustrate the gap between employer policy and practice, and to highlight areas that require intervention within provincial health departments.

Healthcare workers globally find themselves at the coal face of the dual epidemic of TB and HIV. It is well recognised that they have an increased risk of contracting TB on account of their occupational exposure to tubercle bacilli.^{7,9} Furthermore, this risk has been demonstrated to be greater for healthcare workers in low- and middle-income countries, which have a higher TB burden than high-income countries.

Healthcare workers in high TB-incidence countries thus experience increased exposure to TB in their dual role as carers to those who have contracted TB and as members of communities where TB is highly prevalent. While they are considered a high-risk occupational grouping for contracting TB, limited research exists that quantifies their risk in this regard. There is, however, a growing recognition globally that the increasing impact of TB and HIV on healthcare workers in such settings could have a negative impact on public health programmes and the capacity of health systems to respond to the challenges of TB and HIV.

Tuberculosis – burden of disease among healthcare workers

As discussed above, the occupational risks of TB and HIV among South African healthcare workers are greater than those in developed countries.¹⁰

A 2003 review of 51 studies summarised the burden of TB in healthcare workers in low- and middle-income countries.⁹ The prevalence of latent tuberculosis infection (LTBI) among healthcare workers was found to be 54% (range 33% to 79%) and was positively associated with increasing age and duration of employment in a healthcare facility. LTBI incidence was measured in six studies, which showed an annual risk of infection that ranged from 3.9% to 14.3%. The attributable risk fraction from occupational exposure ranged from 2.6% to 11.3%.

TB disease incidence was found to be higher than in the general population. The estimated incidence due to nosocomial exposure was between 25 and 5 361/100 000 per year. A positive association was made between low healthcare worker : TB patient ratio and a higher incidence of TB disease.

While healthcare workers are recognised as a vulnerable and high-risk population for contracting TB, only a few small-scale studies have been conducted in SA to quantify this problem or evaluate factors associated with this risk. (See Table 3)

An early study by Balt et al., who reviewed staff health records between 1986 and 1997 from four dedicated TB centres in Mpumalanga (MP), concluded that healthcare workers were not at increased risk of TB when compared to the general population.¹¹ Wilkinson et al., in a 1998 study, similarly demonstrated a lower incidence of TB among staff at a South African district hospital when compared to the general population during the same period. However, they also demonstrated an increasing incidence of TB among healthcare workers, which they attributed to the rising HIV epidemic during this period.¹²

More recent studies have shown an increase in TB risk and disease burden. In a 2006 retrospective cohort study, which involved staff from eight regional hospitals in KwaZulu-Natal (KZN), Naidoo et al. demonstrated a consistently higher incidence of TB in healthcare workers than in the general population, with a median incidence of 1 133/100 000.¹³ Increased risk was associated with the younger

age group (25 to 29) and paramedical occupational category. Extra-pulmonary TB, which is generally more difficult to diagnose than pulmonary disease, was diagnosed in 23% of cases. The study further demonstrated poor treatment outcomes, with only 41% of TB cases completing treatment.

Table 3: Epidemiological studies of TB in South African healthcare workers

TB prevalence/incidence	Setting / N	
Incidence 275/100 000	Staff at four TB centres in MP	¹¹
Incidence 690/100 000	Staff at a hospital in KZN (n=723)	¹²
Incidence 1 133/100 000	Healthcare workers at hospitals in KZN (n= 49 392)	¹³
Incidence 4 477/100 000	Desmond Tutu healthcare workers research staff in WC (n=182)	¹⁴
Prevalence 5%	TB/HIV care association community health workers in WC (n=215)	¹⁵

Studies of staff located in facilities or projects that deal with TB and HIV-infected patients are instructive, although their findings are not generalisable to the healthcare workforce as a whole. A 2010 screening programme of healthcare workers employed as adherence counsellors and support staff in TB programmes located in the Western Cape (WC) demonstrated a TB and HIV prevalence of 5% and 20% respectively.¹⁵ Another 2010 study showed a 2.3-fold increased TB incidence in a small cohort of research workers when compared to TB incidence in the communities where the researchers worked.¹⁴

The advent of extremely drug-resistant tuberculosis (XDR-TB) has also affected healthcare workers, with studies demonstrating increased risk and relatively poor treatment outcomes.^{16,17} Healthcare workers were shown to be at greatly increased risk of being hospitalised for MDR-TB (incidence rate ratio, 5.46 [95% CI, 4.75 to 6.28]) and XDR-TB (incidence rate ratio, 6.69 [CI, 4.38 to 10.20]) compared to non-healthcare workers.

The studies have also shown that HIV infection in healthcare workers, which greatly enhances susceptibility to contracting TB and progressing from latent to active TB, approximates that of the general population, and ranges from 11.5% to 20%.^{15,18,19} (See Table 4)

Table 4: Epidemiological studies of HIV prevalence in South African healthcare workers

HIV Prevalence (%)	Population	
15.7%	595 healthcare workers from KZN, MP, *FS, **NW	¹⁸
11.5%	Healthcare workers from 2 hospitals in ***GP	¹⁹
20.0%	Adherence supporters TB/HIV Care Association in WC	¹⁵

*FS – Free State Province; **NW – North West Province; ***GP – Gauteng Province

In the absence of large-scale surveillance and screening programmes among South African healthcare workers, it is difficult to arrive at an accurate estimate of TB and HIV prevalence in this population. What is evident is the trend towards increasing incidence and prevalence over time and the markedly increased risk of MDR and XDR-TB.

Policy, statutory provisions and local institutional framework for managing tuberculosis among healthcare workers

A series of initiatives has taken place over the past few years to address the increasing risk of TB in healthcare workers globally and at a national level. (See Table 5) At global level, a policy guideline for promoting access to care for healthcare workers, with a specific focus on TB and HIV, was published in 2010.²⁰ *The Joint WHO-ILO-UNAIDS Policy Guidelines on Improving Health Workers' Access to HIV and TB Prevention, Treatment, Care and Support Services* outlines various recommendations with regard to policy, access to care, workplace practices, adequate budget and the need for monitoring and evaluation. The guideline promotes the strengthening of occupational health policy to better protect healthcare workers and advocates for regular screening, improved infection control, and access to prophylactic and effective treatment for those at risk of or infected with TB and HIV.

At national level in SA numerous policies and occupational health and safety legislation exist. These include regulations that address infective occupational health risks in healthcare workers. Despite legislative and policy provisions the current institutional framework for dealing with this problem is fragmented. What is lacking is an integrated approach that identifies evidence-informed strategies for prevention, surveillance, access to care, treatment and compensation for TB in healthcare workers.

Workers' compensation for pulmonary TB in healthcare workers is provided for under the Compensation for Occupational Injuries and Diseases Act (COIDA), (Act 130 of 1993). The disease is listed in Schedule 3 as an occupational disease and the specific criteria for acceptance of a claim are outlined in the Circular Instruction published by the Department of Labour.²¹ Recently, Schedule 3 has been amended so that TB is now specifically listed as an occupational disease rather than included under a blanket reference to "infectious or parasitic diseases contracted in an occupation where there is a particular risk of contamination caused by biological agents".

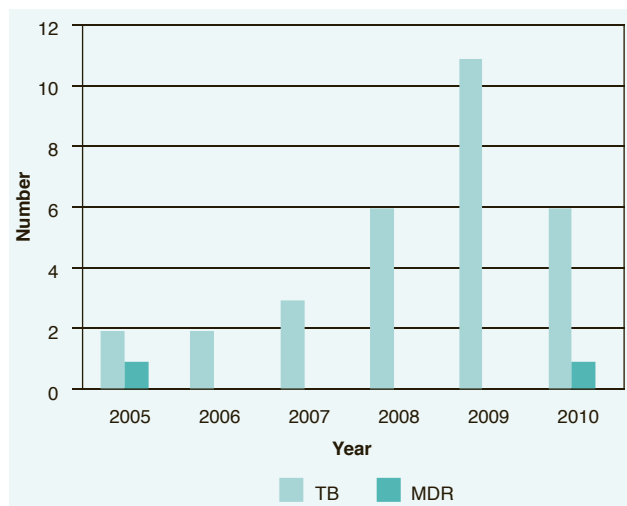
Table 5: Policy and legislative framework for TB and HIV in healthcare workers in SA

Policy	Scope	Agency
Global		
WHO TREAT guideline (2010)	Policy guidelines on improving health worker access to prevention, treatment and care services for HIV and TB	WHO
WHO policy on TB infection control on healthcare facilities, congregate settings and households (2009)	Proposes a set of measures to promote TB infection control at national and facility levels, which include on-site surveillance of TB disease among healthcare workers	WHO
South African Labour Statutes		
Occupational Health and Safety Act (Act 85 of 1993)	Provides for a healthy and safe working environment	*DoL
Regulations for Hazardous Biological Agents (HBA) (2001)	<ul style="list-style-type: none"> • Mandates regular risk assessment every 2 years and specifies that records need to be kept for 40 years • Requires the provision of information and training to employees on potential risks of HBA and risk reduction • Provides for medical surveillance based on risk assessment or presence of an occupational disease directly related to exposure 	DoL
Labour Relations Act (Act 66 of 1995)	<ul style="list-style-type: none"> • Prevents discrimination and unfair dismissal of workers afflicted with occupational disease or injury • Allows for workplace accommodation 	DoL
Code of Good Practice on key aspects of HIV/AIDS and employment (2000)	Provides for: <ul style="list-style-type: none"> • Establishment of a workplace HIV policy and programme • Elimination of discrimination 	DoL
Compensation for Occupational Injuries and Diseases Act (130 of 1993)	Recognises and mandates the reporting of occupational diseases to the Department of Labour	DoL
Circular Instruction Regarding Compensation For Pulmonary Tuberculosis In Health Care Workers (2003)	<ul style="list-style-type: none"> • Mandates the reporting of occupational pulmonary TB and advises on reporting TB and compensation for disability caused in healthcare workers 	DoL
South African DoH Policy		
National Core Standards for Health Establishments in SA (2011)	<ul style="list-style-type: none"> • Develop a common definition of quality care, a benchmark and certification for compliance for all health establishments in SA • Staff are protected from workplace hazards through effective occupational health and safety systems (responsibilities under Occupational Health and Safety Act; active health and safety committees; medical surveillance based on risk assessment in place; measures in place to minimise occupational injuries and diseases) 	**DoH
SA National TB Management Guidelines (2009)	<p>All categories of healthcare personnel have an increased risk of TB when compared to the general population. In addition to reducing their exposure, specific measures that target healthcare personnel are required:</p> <ul style="list-style-type: none"> • Informing healthcare personnel of the signs and symptoms of TB and encouraging early recognition of symptoms and presentation for sputum tests • Ensuring that all healthcare personnel with signs and symptoms are evaluated as "high-risk TB suspects" and have 2 sputum specimens sent for evaluation (a spot specimen for smear and an early morning specimen for smear and culture and drug susceptibility testing) • Providing voluntary counselling and testing (VCT) and encouraging healthcare personnel to know their HIV status • Advocating/providing precautionary measures for HIV-positive staff, such as TB preventive therapy and antiretroviral therapy • Appropriately placing HIV-positive staff in low TB risk areas of the facility 	DoH
Guidelines for TB preventive therapy among HIV-infected individuals in SA (2010)	All HIV-positive individuals should be provided with isoniazid preventive therapy (IPT) once active TB has been excluded (HIV-positive healthcare workers recognised as a high-risk population and eligible for IPT)	DoH
Draft National Infection Control Plan for TB, MDR TB and XDR TB (2007)	<ul style="list-style-type: none"> • Increasing awareness of TB in healthcare workers • Increasing access to VCT • Providing personal protective equipment • Reducing spread of infection with MTB in healthcare settings 	DoH

*DoL – Department of Labour; **DoH – Department of Health

Western Cape provincial figures indicate that an increasing number of healthcare workers have received workers' compensation for TB. (See Figure 3) However, there is evidence of underreporting when these figures are compared to findings of epidemiological studies in this province. Despite underreporting, Pulmonary TB is the third most frequently reported occupational disease in SA.²²

Figure 3: Trends in the number of TB and MDR-TB cases compensated by the Western Cape Department of Health, 2005-2010



Source: Western Cape Department of Health. 2011.²³

Much of the focus on addressing TB in healthcare workers has been through general infection prevention and control approaches in healthcare facilities that are determined by the National Infection Prevention and Control Policy and Strategy of 2007.²⁴ These approaches generally include surveillance, environmental management, waste management, outbreak investigation, cleaning, disinfection and sterilisation, employee health, and quality management in infection control.

At district and facility levels, these programmes are meant to be overseen by multidisciplinary committees established specifically for this purpose. Committees are made up of, among others, microbiologists, clinicians, and management representatives. They are also made up of healthcare workers from areas in the facility such as pharmacy, sterilising, and housekeeping and training services. The committee is also meant to ensure the development and updating of infection prevention and control policies, guidelines and protocols within the facility. These committees have historically operated separately from the occupational health and safety committees required by the Occupational Health and Safety Act. (See section below.)

The 2011 promulgation of the National Core Standards for Health Establishments in South Africa is an attempt to address failings in the public healthcare sector by setting clear norms that health facilities should meet to be considered institutions that promote quality health care and are ready for NHI rollout. The Standards specifically address the need for occupational health and safety systems to limit occupational injuries and diseases among healthcare staff. At provincial level, health departments have adopted various approaches within these broad policy frameworks and legislative requirements, some more extensive than others.

In summary, while several policies address various aspects of TB risk to healthcare workers, currently no uniform national strategy is available that actively supports the management of TB risk in healthcare workers. Specifically staff in healthcare institutions are not universally provided with the tools and resources to implement policy recommendations. Little active enforcement takes place of regulations such as those mandating risk assessment of healthcare institutions and work environments or training of healthcare workers. This weak enforcement capability contributes to ineffective risk management when labour statutes are contravened. These elements are examined in more detail in the next section in the context of a single province.

The problem is compounded by a lack of data and poor reporting systems, which are unable to provide an accurate picture of the extent of the problem. Furthermore, while strategies have been adopted to improve the performance of the national TB programme, such as focusing on intensified case finding, isoniazid prophylaxis and improved infection control, these interventions have been aimed at TB patients. Little or no focus has been put on healthcare workers tasked with the delivery of such care to patients.^{25,26}

Management of occupational health and safety in the provincial health sector – example of the Western Cape

A number of policies and guidelines address health and safety measures to manage the increased risk of occupational TB among healthcare workers. However, information is lacking on programmes and practical measures that have been implemented to better manage this risk.

Data from a 2010 audit conducted in districts and substructures, under the jurisdiction of the Western Cape Department of Health, from 106 healthcare facilities, clearly illustrate the gap between policy and practice in occupational health and safety management.²³ The data also provide a benchmark against which other provinces can compare their performance.

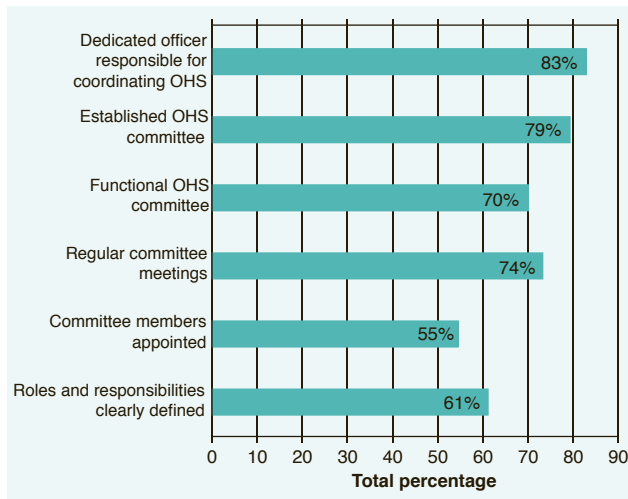
The audit was aimed at ascertaining the level of occupational health and safety compliance as a first step towards assessing the effectiveness of the Western Cape Department of Health in addressing the health risks of its workforce. (See Figure 4.) The survey found that while formal (79%) and functional (70%) health and safety committee structures were in place, and 83% reported having dedicated officials to coordinate occupational health and safety in the districts and facilities, there was no consistency between the operations of committees in metropolitan and rural districts. In both contexts, the general trend is for smaller facilities to form part of a committee at a larger institution or at sub-district level. This appears to be more practical and allows for greater support and capacity to deal with issues. However, it creates a problem of a "one size fits all" approach to occupational health and safety and setting priorities, based on the occupational health and safety needs of larger institutions. These needs may be very different from those of smaller clinics and facilities.

Furthermore, while officials were adequately nominated, only 55% of facilities reported that members were formally appointed under section 16.2 of the Occupational Health and Safety Act and only 61% reported that their roles and responsibilities were clearly defined. These problems underscore the need to develop capacity

in occupational health and safety skills within the Western Cape Department of Health.

These committees have been tasked with ensuring that risk assessments and specific risk management programmes are developed for priority risks through the implementation of specific policies and standard operational procedures. The committees and programmes are also expected to ensure the early detection of occupational infections and other diseases through monitoring and surveillance.

Figure 4: Occupational health and safety (OHS) committees in Western Cape healthcare facilities (n=106)



Source: Western Cape Department of Health, 2011.²³

In practice, however, the Western Cape audit found that only 46% of facilities had a risk assessment programme, despite the legal requirement that such an assessment be carried out every two years.²⁷ (See Figure 5.) A number of facilities indicated that occupational health and safety staff and representatives lacked the requisite training, skills, and in-house tools and resources to conduct risk assessments. In certain facilities an outside service provider was sourced at considerable cost. In some facilities, the Facilities Risk Assessment Tool for Tuberculosis (FRATT) was used for conducting risk assessments and implementing relevant measures to control the spread of TB.

The audit also found that 25% of facilities had a biological monitoring programme (which focused on exposure to chemicals such as ethylene oxide and radiation exposure); 39% had medical surveillance programmes (aimed at detecting TB and Hepatitis B); and 63% had annual screening programmes. (See Figure 5.) Wellness screenings, which focused on non-communicable diseases and HIV, AIDS and TB, were conducted in certain health establishments.

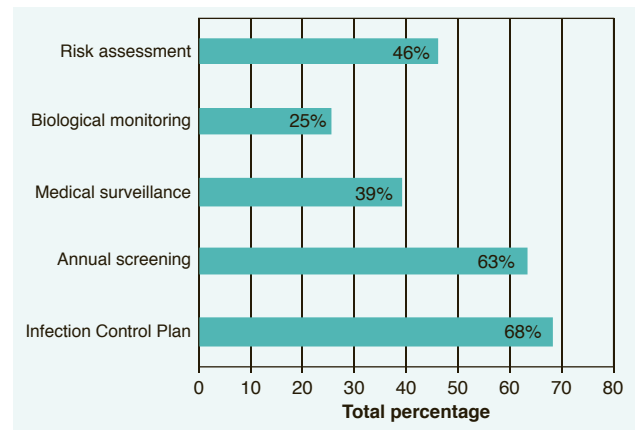
Despite the obvious infection risk in these healthcare facilities, only 68% of facilities reported having a mandatory and functional Infection Control Plan in place. These plans focused on outbreak investigation and testing, health surveillance, vaccination, employee placement, post-exposure prophylaxis and control measures.

In a number of facilities, occupational health and safety and infection control measures were viewed as a supplementary activity, with a low level of commitment and accountability among

senior management. This attitude fosters a reactive approach to occupational health and safety issues that only attracts attention and resources when occupational health and safety failures become too difficult or costly for the institution to conceal or ignore.

A limitation of the above audit is that it is based on self-report, which is likely to err in the direction of overstating performance. Actual practice is likely to fall short of the figures given below.

Figure 5: Occupational health and safety (OHS) programmes in place in Western Cape healthcare facilities (n=106)



Source: Western Cape Department of Health, 2011.²³

Programme integration and governance

The above review suggests that if provincial departments are to achieve progress in controlling TB in their staff, coordination and integration of the various policies and activities at all levels are required.

Recent initiatives in the Western Cape have attempted to address this fragmentation of occupational health and safety, infection control activities, employee wellness and quality assurance through the establishment of a single body, the Provincial Quality Improvement Committee (PQIC). This committee falls under the Directorate of Health Impact Assessment. The committee aims to establish a basis for accountability for various actions using the legal requirements of the Occupational Health and Safety Act and the 2011 National Core Standards for Health Establishments in SA.

The objectives of such moves are to ensure uniform and structured health and safety programmes as well as monitoring and evaluation in health facilities and districts throughout the province. With regard to managing the TB risk in staff, there is a need to operationalise national strategies, such as the National Tuberculosis Strategic Plan for SA (2007-2011), and ensure compliance with international standards and national legislation and policies on occupational health and safety and employee health and wellness.

Table 6: Prevalence (%) of silicosis and past or current TB among active or former gold miners

Study	Yr of study	Average length of service of sample (yr) (range)	Silicosis prevalence	TB (past or current) prevalence
Active miners ³²	1984	-	Overall: 1.3% Age 51-55 y: 15%	-
Botswana ex-miners ³³	1994	15.5 (2-42)	27%, 31%*	29% (history) 24% (CXR)
Former Transkei+ ex-miners ^{34,35}	1996	12.2 (0.5-34)	22%, 36%*	51% (history) 33% (CXR)
Active miners ^{36,37}	2000-2001	21.8 (6-34.5)	19%	19% (history) 17%, 28%*
Basotho ex-miners ^{38,39}	1999-2001	25.6** (0.9-40.2)	Baseline: 24% Follow-up: 27%***	26% (history) 6% (active)
Black miners at autopsy ⁴⁰	1975-2007	7.7 (1.1-48)	1975: 3% (autopsy) 2007: 32% (autopsy)	

History: self-reported. CXR: chest x-ray.

*2 CXR readers **At baseline, ***Among those attending both rounds

+ Now part of the Eastern Cape Province.

Compensation for occupational lung disease among former mineworkers

Compensation for occupational lung diseases among former mineworkers has long been a contentious issue in South Africa. This section thus deals with a very different group affected by Department of Health operations – former mineworkers. Despite cyclical variation in its profits and prospects, the South African mining industry remains a pillar of the economy, with a net asset value in 2010 of R18 trillion and employment of 500 000 people.^a While violent wage strikes and mine accidents such as rock falls make front page news, the high burden of lung disease in the mining industry has only recently captured the concern of politicians, the public and the public health community.

Silica, silicosis and tuberculosis – burden of disease among gold miners

A raft of studies have confirmed a substantial epidemic of silicosis (nodular fibrosis of the lung due to silica dust) among active and former gold miners. (See Table 6) Among those with histories of relatively long periods of working in dust, prevalences in the order of 20% and more have been recorded in cross-sectional surveys. (See Table 6) These high prevalences are in contrast to the steadily declining prevalence and severity of silicosis in developed countries²⁸⁻³⁰ and in China.³¹

The elevated risk of pulmonary TB associated with mining and particularly gold mining has recently focused the attention of the health authorities and public health community on occupational risks in the mining population.⁴¹⁻⁴³

The close association between silica, silicosis and TB has been known for over a century and has been confirmed in modern studies.^{37,44} This particular hazard arises from biological impairment by silica dust of the lung's natural defences against TB.⁴⁵ The added risk factors of close contact in mining accommodation and working spaces and HIV infection associated with a migrant mineworker population⁴⁶ have created a 'perfect storm' for TB among mineworkers. (See Tables 6 and 7) Gold miners now have what is probably the highest annual incidence of TB in the world,

with high rates of recurrence and inevitably rising rates of MDR-TB. (See Table 7)

Disease now overshadows injuries. In the gold mining sector, while the fatality frequency rate decreased from about 0.44 in 2002 to 0.17 in 2011 (a decline of 61.3%),⁵ the proportion of active pulmonary TB discovered at statutory autopsy escalated from approximately 0.29 (290/1 000) to 0.37 (370/1 000) between 2002 and 2007, which represents an increase of 21.6%.⁴⁷

Table 7: TB in gold miners in SA: epidemiological indicators

Measure (study)	
Incidence ⁴⁸	Approx. 3 per 100 person-years (range 1-7 per 100 person-years)
Prevalence of latent TB infection ⁴⁹	89%
Recurrence rate of pulmonary TB ⁴⁸	HIV positive: 19 per 100 person-years HIV negative: 7.7 per 100 person-years
Proportion of MDR-TB cases ⁵⁰	Previously TB untreated: 2.8% Previously TB treated: 20-25%
HIV prevalence ⁵¹	22-30%

The consequences of this mining-related epidemic are being felt throughout the subcontinent.⁵² In particular, the epidemic has spread the burden of healthcare for these diseases from the private mining industry to the public healthcare systems of these countries.

What is the appropriate health system response to this combined epidemic with its roots in the private mining sector? For the purposes of a volume devoted to a review of health policy, we take as our starting point the statutory responsibility of the government and, particularly, the Department of Health.

^a Personal Communication: Prof. Barry Kistnasamy, August 22, 2012.

The role of the Department of Health – the Occupational Diseases in Mines and Works Act

Various government departments have responsibility for the health and safety of mineworkers. The Department of Mineral Resources is the lead department concerned with health and safety on the mines, while the Department of Labour is responsible for compensation of occupational injuries and certain diseases. However, in terms of the Occupational Diseases in Mines and Works Act (ODMWA) 1973 (as amended in 1993),⁵³ the Department of Health has three important responsibilities. These are to:

- provide for regular medical examinations for former mineworkers;
- medically adjudicate claims for certain occupational lung diseases in miners; and
- manage the Compensation Fund for these occupational diseases, financed by levies on mine owners, and make payment to successful claimants.

The agency responsible for overseeing or discharging the first two of these responsibilities is the Medical Bureau for Occupational Diseases (MBOD) – “the Bureau”, while the Compensation Commissioner for Occupational Disease (CCOD) administers the third. The diseases covered by this Act are summarised in Box 1.

Box 1: Occupational lung diseases in miners compensable under the ODMWA, 1973

Tuberculosis:

- ❖ Of cardio-respiratory organs in a miner who performed risk work for more than 200 risk shifts (equivalent to 9 months) and/or was diagnosed within 12 months of exiting the mining service

Pneumoconioses:

- ❖ Silicosis (and alveolar proteinosis post-mortem)
- ❖ Coal workers' pneumoconiosis
- ❖ Asbestosis (interstitial and pleural)
- ❖ Any combination of pneumoconiosis with TB

Obstructive airway diseases; also in combination with TB

Malignant mesothelioma and lung cancer in asbestos miners or designated asbestos occupations

Progressive systemic sclerosis/scleroderma with pulmonary involvement in miners exposed to silica dust

Asthma due to platinum salt sensitivity

Source: Personal Communication Dr L. Dzingwa, Medical Bureau for Occupational Diseases, 2012.

The ODMWA must be distinguished from the Compensation for Occupational Injuries and Diseases Act (COIDA), 1993,⁵⁴ which covers injuries (including those in mining) and occupational diseases not covered by the ODMWA. The COIDA is administered by the Department of Labour on an entirely different basis from the ODMWA. Relevant differences between the two Acts are set out in Table 8.⁵⁵ These include inequity in financial benefits between mineworkers and workers in other sectors, with mineworkers frequently receiving fewer benefits for the same condition. While

Table 8: A comparison of compensation for workers in terms of the ODMWA, 1973 and the COIDA, 2003⁵⁵

Feature	Occupational Diseases in Mines and Works Act (ODMWA), 1973	Compensation for Occupational Injuries and Diseases Act (COIDA), 2003
Coverage	Listed occupational lung disease in miners	Injuries in all sectors, which include mining, and occupational diseases other than those covered by the ODMWA
Funding	Levies on employers – fixed levy per shift for each commodity, e.g. gold	Levies on employers – risk rated on claims record by class of industry
Administration	Department of Health	Department of Labour (see footnote for two partial exceptions)**
Adjudication of claims	Medical certification committee	Medical advisors in COIDA administration
Appeals body	Reviewing committee	Formal hearing convened by Commissioner
Provision for autopsy	Mandated and performed by state pathology service	None
Post-mortem compensation	Payable to beneficiaries even if disease did not contribute to death	Payable only if disease contributed to death
Examinations for compensation purposes	Employer's responsibility for active miners. Authorised medical facilities or practitioners for ex-miners (minimum 2-yearly)	No specific provision
Payment for medical care	Employer's responsibility if disease diagnosed while miner still employed (relevant mainly to TB)	Covered by Compensation Fund for up to 2 years
Temporary incapacity benefit	75% of earnings for temporary incapacity while on treatment for TB	75% of earnings for any total temporary incapacity up to 2 years
Permanent incapacity benefit	Two grades only	May be graded at any percentage – based on impairment
Radiographic threshold for silicosis compensation	“10-40% impairment”: ILO grading 2/2	“20% permanent disablement”: ILO grading 1/0
Pension provision	None	Lifetime monthly payment if permanent disablement assessed as >30%

Source: International Labour Organization, 1980.⁵⁷

* For detailed benefits comparison, see White, 2004.⁵⁸

**Miners and building industry employees are covered by two private companies, Rand Mutual Assurance Co. Ltd. and Federated Mutual Assurance Co. Ltd., respectively. These companies receive levies and administer claims payment in terms of the Act, but do not set benefits nor perform claims adjudication, which remain the prerogative of the COIDA Commissioner.

this inequity is a pressing political and economic question in the mining sector, the focus of this review is on the Department of Health's responsibilities under the ODMWA.

As will be argued below, the Department has failed to exercise these responsibilities properly and fully extend the benefits enjoyed mainly by white mineworkers prior to 1994 to the large majority of black mineworkers. This is despite the legislative changes enacted in 1993 to deracialise the legislation.⁵⁶ This failure may be at least partly because the ODMWA mandate is an anomalous historical legacy, and one that has been marginal to the main policy tasks facing the National Department of Health over the past two decades.

The belated realisation of the mining industry's contribution to the country's TB epidemic⁴¹ and a number of internal institutional factors have recently focused the Department of Health's attention on the ODMWA. Poor financial management of the CCOD has resulted in a series of negative audits.⁵⁹ The ODMWA Compensation Fund itself was described as "technically insolvent" after an external audit in 2003.⁶⁰ The subsequent increase in levies pursued by the ODMWA Commissioner elicited a failed court challenge by the Chamber of Mines.⁶¹ Administration of the CCOD has been repeatedly criticised in parliamentary hearings, which have elicited admissions by the Minister and the Director-General that the CCOD was dysfunctional and that the Department had mismanaged it.^{59,62} In 2012, the Minister placed the MBOD and CCOD under the line management of a chief director within the National Department of Health.⁶²

As background to what is required of the Department of Health to meet its ODMWA responsibilities, it is necessary to understand the statutory and institutional framework for the examination and treatment of mineworkers for occupational lung disease.

Statutory and institutional framework for managing lung disease among mineworkers

The prevention of occupational lung disease in the mining industry is the responsibility of the Department of Mineral Resources, via the Mine Health and Safety Act (MHSA) (Act 29 of 1996).⁶³ This Act requires the medical examination of mineworkers at entry to employment, at regular intervals while in service and at exit.⁶⁴ The latest in a series of Acts aimed at maintaining safety, and later health in mining operations, this legislation effectively transferred all responsibility for establishing medical fitness for mine work and ongoing medical surveillance during employment to private mine owners.^b

The other piece of legislation relevant to managing lung disease among mineworkers, and the more important for the purposes of this section, is the ODMWA. In terms of this legislation, the Bureau, located in Johannesburg, employs panels of medical practitioners to adjudicate claims for mining-related diseases. The Director of the Bureau is also responsible for arranging "benefit" (compensation) medical examinations for former employees of mines. The CCOD, also located in Johannesburg, performs the administrative tasks of confirming work histories and identities of claimants and making payment according to a schedule defined in the Act.

b Prior to the latest Act, white workers were required to obtain a certificate of fitness ("red ticket") from the Bureau or one of its sub-bureaux. Medical examination of black workers was historically devolved to the mines or their recruiting agencies.

Compensation is paid from funds financed by levies on mining companies, which pay a fixed amount per risk shift on the basis of the commodity mined. Gold mining companies now pay R7.14 per shift (up from 39 cents per shift in 1998),⁶⁵ platinum R1.79 and coal R1.44.^c The assets of the ODMWA Compensation Fund were R1.75 billion in 2010/11, just short of its liabilities of R1.8 billion.^a

The Act provides for lump sum compensation awards at two levels only. "First degree" awards are for scheduled non-malignant conditions, mainly pneumoconiosis and chronic obstructive pulmonary disease. "Second degree" awards are typically made for pneumoconiosis plus TB or for cancer. (See Box 1 above.) The maximum amounts payable are currently R47 000 and R105 000 respectively. These are based on a "capped" monthly wage of R3 000, which is below the current average wage in the industry of R4 904.⁶⁶

In 1989/90, the last year for which racially differentiated statistics were reported, 865 new or upgraded certifications were recorded in living and deceased white and coloured claimants (all mining types). Among black claimants, 4 231 certifications were recorded for compensable TB and 2 046 for other compensable diseases.⁶⁷ By 2011, the total number of certifications had fallen to 3 875.^c

The ODMWA was transferred to the Department of Health from the (then) Department of Mines in 1984.⁶⁸ Current attempts to reverse a prolonged period of stasis will require vigorous policy action on the part of the Department. This is considered below in two parts. The first concerns the provision of benefit medical examinations and the second the management of the Bureau and CCOD.

Access to benefit medical examinations by former mineworkers

Mineworkers still in employment who are diagnosed with a compensable disease have their medical benefit examinations carried out by mine medical services. However, for former mineworkers, obtaining a benefit medical examination is the responsibility of the individual. Mineworkers who have not reached second degree compensation (see above) are entitled to an examination every two years. This entitlement affects large numbers of people and creates a substantial service mandate for the South African state. This is in addition to the established responsibility for treating TB in former miners in SA through the Tuberculosis Control Programme.

Approximately 12 000 benefit medical examinations were conducted in 2011.^c The 2012/13 to 2014/15 Annual Performance Plan of the Department of Health calls for an increase to 22 000 by 2014.⁶⁹ However, the actual number of living ex-miners and, therefore, the true population entitled to these examinations is not known. The largest affected group includes gold miners because of the role of silica dust from gold mining ore in producing silicosis and silico-TB. Employment on the gold mines fell from 480 000 in 1988 to 160 000 by 2006.⁷⁰ Approximately half of the 2007 workforce was from neighbouring countries, mainly Mozambique and Lesotho.⁷¹ The implication is that active miners are now outnumbered by former gold miners, many of them not in SA. The second-largest claimant group is likely to be former asbestos mineworkers from the smaller, and now defunct, asbestos mining industry.⁷²

c Personal Communication: Dr L. Dzingwa, Acting Director, Medical Bureau for Occupational Diseases. 2012.

Accessibility to such examinations by former mineworkers depends on their home location and on their understanding of this entitlement, both of which have been strongly patterned by the racialised history of the mining industry. Prior to 1993, only whites had access to these examinations at the fully equipped Bureau in Johannesburg, and to sub-bureaux in Welkom, Klerksdorp, Carletonville Rustenburg, Dundee, Kuruman and Bellville. After deracialisation of the system in 1993, the Bureau was opened to all. However, the sub-bureaux were closed in the 1990s and no attempt was made to replace them with equivalent services closer to where the majority of former mineworkers live.

Similarly, while whites tend to be familiar with the medical examination entitlement under the Act, the same does not apply to black miners. A recent study in the Eastern Cape of 200 former miners found that none were familiar with the system of benefit medical examinations.⁷³

Currently, any medical practitioner may carry out a medical benefit examination and submit the required forms and test results, including chest x-rays, to the Bureau. However, in order to be paid for the examination (October 2012 rate: R330),^c prior authorisation is required from the Director of the Bureau. Currently a few authorised general practitioners, mainly in the Eastern Cape, perform these examinations.

The default situation is that former mineworkers are required to find their way to provincial health facilities in SA. The Bureau has from time to time sought to establish specific examination points in rural areas of SA.⁷⁴ The 2012/13 to 2014/15 Department of Health Annual Performance Plan lists 190 “service providers” that offer benefit medical examinations, with the target of increasing these to 240 by 2013/14.⁶⁹ In practice, however, few state facilities are able to conduct and submit the required examinations. These facilities face a multitude of problems in assisting former miners, related to shortages and turnover of knowledgeable healthcare staff; limitations of equipment, space and transport; and claimant and agent fraud.⁷⁵ Attempts by the Chamber of Mines to establish benefit medical examination points in Nongoma, KwaZulu-Natal, and Umtata in the Eastern Cape, have yet to be evaluated.

Mineworkers in neighbouring countries have even fewer options. Former mineworkers in Botswana are offered free benefit medical examinations,^c but otherwise no special arrangements for examinations currently exist in these countries.

Accessibility of the families of deceased former miners, specifically black miners, to statutory autopsies provided for by the ODMWA is predictably worse. Potential barriers include lack of understanding by the family of the statutory entitlement and unwillingness to consent to having the heart and lungs removed. Unavailability of a medical practitioner equipped or willing to remove the heart and lungs, prior to storage and transport to the National Institute of Occupational Health laboratory service in Johannesburg, is also a problem. Currently, former mineworkers account for a very small proportion of autopsies conducted on black mineworkers and, apart from a few resulting from a small programme in Lesotho, effectively none from former mineworkers in neighbouring countries.^d

In attempting to improve access to benefit medical examinations and autopsy services, the Department of Health is faced with a

conundrum. The Act effectively creates a vertical programme for former mineworkers, with special requirements for the examinations, specific forms that need to be completed and a complex claims procedure. This structure runs contrary to the Department’s main policy thrusts of comprehensive primary health care and NHI.

A hybrid solution could aim at the training of primary care staff to identify potential ODMWA claimants in the areas where former mineworkers live, followed by referral to specialised examination points or clinics. Such training would need to be more or less continuous to take into account staff turnover. Referral points would also require a resource commitment over and above normal primary care activities.

Links to the major recruiting agency for the gold mines, TEBA, could assist in validating work records and tracking gold miners in rural areas. This administrative and tracking component is an essential part of the benefit medical examination and, seemingly, the stage at which many claims under the OMDWA currently run aground.⁷⁶ The work required will, however, add further costs to the benefit examination process.

A private model of relevance is the Asbestos and Kgalagadi Relief Trusts, set up following a lawsuit settlement to provide medical examinations to a population exposed to asbestos from the operations of a number of qualifying mines in the Northern Cape, Limpopo and Mpumalanga provinces. The Trusts took responsibility not only for soliciting and adjudicating claims but also for recruiting and training general practitioners in assessment of asbestos-related disease (which included office spirometry). Working with a small full-time office staff and a panel of radiologists and occupational medicine specialists that operated on a part-time basis, the Trusts managed approximately 14 000 claims between 2005 and 2011.^e Activities by the Trusts in these areas have also resulted in a substantial increase in deceased former mineworkers being referred for autopsies under ODMWA provisions.

Claims management: reform of the Bureau and CCOD

Expansion of access to benefit medical examinations will be a wasted effort if the functioning of the Bureau and particularly the CCOD is not improved.

The first requirement is timeous assessment of claims. The Bureau code of conduct (written in terms of section 43 of the Act) requires that it certify cases within six months of receipt of documentation. Section 48.1 also explicitly states that it must inform claimants within 10 days of certification. In a 2010 review of claims delays, the efficiency of the Bureau was found to have deteriorated significantly from a median response time of 8 months during the 1993-2000 period to 13.5 months during 2001-2005.⁷⁶ The overall range was 1 to 46 months. Other complaints about the Bureau have included poor registration of claims, lost documents and difficulty getting information on claims.⁷⁷

Public scrutiny of the Bureau’s operations is not currently possible since, contrary to the requirement of section 7 of the Act, the Bureau has not issued an annual report since 1999. Reportedly, the claims turnaround time has been reduced to under six months and annual

d Personal Communication: Prof. J. Murray, National Institute for Occupational Health.

e teWaterNaude et al. Medical Report for the period ended 29 February 2012. Asbestos Relief Trust and Kgalagadi Relief Trust. August 2012 (private communication).

reports are being prepared for the past few years. A significant obstacle to sustaining this improvement is the difficulty of recruiting qualified medical staff at the remuneration level currently being offered by the MBOD.⁶

The financial woes of the CCOD and the failure of the Department of the Health, by its own admission, to manage and staff the CCOD properly have been noted above. The Maiphethlo and Ehrlich study of 2010 found that in less than half of the claims processed by the CCOD the claimants were confirmed to have received their awards, with the average delay for the whole claims process being over four years.⁷⁶ A 2002 audit of compensation of postmortem (autopsy) certifications found a payment rate of only 7%.⁷⁸ As of 2011 the backlog of claims stood at around 13 000.⁶²

The recent re-organisation of the line structure of the Bureau and CCOD signals a new intention within the Department to deal with the problem.⁶² However, budgetary constraints remain. While levies on the mining industry can be increased to underwrite compensation payments, the administration costs of the Bureau (including the costs of examining former mineworkers) and CCOD have to come from the Department of Health's budget. This amounted to a call on taxpayers of approximately R38 million in 2011.⁶⁹ The assumption of these costs by the state reflects the history of accommodation of successive pieces of compensation legislation to the needs of the mining industry and pressures from mineworkers, particularly white organised labour.

However, a case can be made for these costs to return to the Compensation Fund, which is funded through employer premiums. The defrayment of administration costs from premium revenue is the norm for insurance funds, which includes the fund provided for by the COIDA. It can also be argued that the mining industry would have a greater stake in ensuring the efficiency of the Bureau and CCOD if it were responsible for their financing. Such a move would also relieve the pressure on the public sector or on a future NHI fund to fund medical benefit examinations.

It can also be argued that while the organisation of medical benefit examinations and, arguably, the medical adjudication of claims fall within the core business of the Department of Health, the non-medical functions of administration and payment of claims do not. More recent attempts to move the administrative function of the CCOD to Rand Mutual Assurance Co. Ltd have reportedly been shelved. Rand Mutual Assurance is the assurance company that administers all mining industry occupational disease claims not covered by the ODMWA (for example, noise-induced hearing loss) and all mining occupational injury claims. Turning the CCOD around will be a major task for a department burdened financially and managerially by major reform initiatives in other areas of the public healthcare system.

Conclusion

Healthcare workers in SA are at increased risk of contracting TB by virtue of their occupation. This risk is compounded by high rates of HIV infection and the lack of implementation of effective occupational health and safety measures to protect them adequately. The extremely high risk of acquiring drug-resistant TB among this vulnerable group is further testimony to the inadequacy of the protection measures currently in place. Recognising this

risk and developing policy in this area do not constitute sufficient protection and will do little to modify the risk. The protection of healthcare workers needs to be supported by a dedicated focus that incorporates commitment from top management; comprehensive, locally appropriate and practicable policies; the implementation of effective infection control measures informed by and integrated with other occupational health and safety measures; training; ongoing surveillance; and the provision of comprehensive occupational health services to healthcare workers.

In the mining sector, it has long been apparent that a large burden of occupational lung disease has been externalised from the mining industry to impoverished areas of the southern African region. The mining industry must be held accountable for reducing one of the root causes of this epidemic at source; namely, the exposure of miners, particularly gold miners, to hazardous levels of silica dust. More complex root causes are the century-long reliance on the migrant labour system by parts of the industry and the nature of mine accommodation. These factors have created fertile soil for the spread of TB and HIV infection. However, the Department of Health remains responsible for providing statutory medical examinations (in addition to treatment of TB and HIV-related disease) for the growing population of former miners. It must also adjudicate and arrange the payment of compensation for occupational lung disease. There is a need for the Department of Health to recover a sense of accountability and urgency about this mandate.

Recommendations

Healthcare workers

- Protecting healthcare workers against TB needs to be assigned priority by those tasked with managing healthcare programmes, facilities and human resources.
- Health and safety management systems should be strengthened where they exist and developed where they are absent to better address and prioritise this risk.
- Systems need to be developed to support a strategy of continued surveillance for TB in this high-risk population. This will ensure an accurate picture of the true extent of the problem and the impact of interventions. Such surveillance programmes may need to employ both active and passive case-finding strategies.
- The provision of comprehensive occupational health services to healthcare workers will enable the delivery of large-scale surveillance and employee wellness services in an integrated fashion.
- Strengthening and visibility of occupational health and safety enforcement initiatives by the Department of Labour may contribute positively to protecting healthcare workers against TB risk.
- Ongoing monitoring and evaluation of strategies employed to manage TB risk are imperative to close the gap between policy and practice.

Mineworkers

Legal, financial and managerial reform of the ODMWA system is long overdue.

Shorter-term goals include the following:

- A rural infrastructure to increase access for conducting benefit medical examinations should be provided and financed.
- A formal evaluation of the nature and effectiveness of the “190 service points” mentioned in the 2012/13 to 2014/15 Annual Performance Plan of the Department of Health is needed.
- Cross-border arrangements for occupational lung disease detection and compensation with relevant agencies need to be negotiated, particularly in Lesotho and Mozambique.
- “In house” targets include attracting qualified staff to the Bureau to ensure rapid turnaround of claims and vigorous management of the CCOD to remove the blot of 13 000 backlogged claims.

Intermediate policy goals should be to shift the responsibility of financing the administration of the system to the Compensation Fund and to give serious consideration to outsourcing the administrative functioning of the CCOD to the private sector.

Finally, inequity between the financial benefits obtainable by various categories of workers under the ODMWA and COIDA is probably the single most contentious political and economic aspect of the system and requires urgent high-level policy and legal reform.

Conflict of interest

Rodney Ehrlich has written expert technical reports for use by attorneys for the plaintiffs in compensation litigation and current silicosis litigation.

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Citizen Reporting on District Health Services

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When the village clinic in Lusikisiki failed to open because the Eastern Cape Department of Health had not paid the rent, the news was circulated on the web that very day, along with pictures of patients locked outside.

Community activist Mtshana Mvlisi had returned to the rural village from training as a citizen journalist two days before the clinic's closure in October 2012. He was able to use his new skills to write a short news report and send the report and photographs via a tablet computer to Health-e News Service, where these were edited, loaded onto the Health-e website and read by thousands of people.

Mvlisi is part of OurHealth, a small but ambitious pilot project aimed at reporting on, and ultimately improving, health conditions at district level. It was started by Health-e News Service, which has been reporting on health news for the mainstream media since 1999.

OurHealth is based in 5 of the 10 pilot districts for the National Health Insurance (NHI): OR Tambo district (Eastern Cape), Vhembe (Limpopo), Tshwane (Gauteng), Umgungundlovu (KwaZulu-Natal) and Thabo Mofutsanyane (Free State). As funding becomes available, it will be expanded to all NHI pilot districts and ultimately to as many of the country's 52 health districts as is financially feasible.

The main aims of OurHealth are to:

- expose the health issues and challenges experienced by some of the poorest, most marginalised areas of the country;
- obtain reports directly from the people who use public health facilities every day about their experiences;
- hold the district service providers accountable for conditions and services at clinics and hospitals and hold accountable the municipalities that supply services that affect health, such as water and sanitation; and
- report on inspirational people and projects that improve the health of ordinary people.

A growing body of research demonstrates that, where formal accountability such as democratic elections fails to deliver better services to poor people, collective action by or on behalf of the poor can make policy makers and service providers more responsive and accountable.

Managing editor of Health-e News Service, founder of the OurHealth project

Such collective action, defined as “social accountability”, involves current efforts by civil society groups, which include the media, to hold public officials and service providers accountable for service delivery. This accountability is achieved first through providing people with information and then “imposing reputational and political costs on providers by making state failures public”¹ through, for example, the media and public meetings. This, in turn, can “trigger formal accountability mechanisms”, which in the case of South Africa could be court action or investigations by the Public Protector and the SA Human Rights Commission.¹

International examples of how media-driven social accountability has had an impact on service delivery include India, where government responded better to floods and drought in places with good newspaper penetration, and Brazil, where radio station reports on local government candidates’ expenditure records had an effect on their re-election chances.²

Health-e’s current and sustained record of reporting on health service delivery, particularly in underreported provinces and areas, forms part of the development of a culture of social accountability in South Africa. This social accountability attempts to hold service providers accountable and to empower people both to make healthier choices and to demand the health services that they have the right to. OurHealth is taking this one step further by obtaining reports from people who live in communities and use public health facilities.

New York University Journalism Professor Jay Rosen defines citizen journalism as:

When the people formerly known as the audience employ the press tools they have in their possession to inform one another.³

The Internet, combined with a rise of social media tools such as Facebook and Twitter, has enabled citizen journalists to report on a wide variety of events with relative ease and to distribute their reports widely.

In some cases, citizen journalists and bloggers that use social media have had a major impact on social events, particularly in countries where freedom of expression is suppressed and conventional media outlets are censored. The so-called “Arab Spring” or uprising, particularly in Egypt in 2011, is one example where Facebook and Twitter played an important role in mobilising and organising people against their repressive governments.⁴

While none of the OurHealth citizen journalists have a media background, they have all been active in organisations such as the Treatment Action Campaign, Black Sash and loveLife Groundbreakers and have some experience in educating and mobilising people and in dealing with local authorities. Each citizen journalist has a tablet computer on which to write their reports. They are expected to submit one story a week of about 300 words and are paid per story.

OurHealth aims to collect human stories, particularly from people in rural areas and informal settlements. These people often experience the worst services yet are least likely to have the agency to reach the media or decision makers.

Since the OurHealth pilot was launched in October 2012, the citizen journalists have reported on a number of interesting and

important stories that otherwise would have been unlikely to receive coverage or attention.

From Lusikisiki, Mtshana Mvlisi and Thandeka Vinjwa have continued to track the village clinic’s closure and the subsequent relocation of patients to a park home without water or electricity. They have also reported on conditions at Madwaleni Hospital, which had only one doctor during 2012. Mvlisi’s story on a strike at the medicine depot in Mthatha and its effect on provincial hospitals featured in national newspapers.

From Vhembe, one of the stories Surprise Nematlale followed concerned taps being without water in Matavhela and Mufulwi villages for two-and-a-half months. Her reports played a role in getting the water supply restored.

From the Free State, Thamsanqa Majola reported on the many health issues facing residents of Selahliwe informal settlement near Bethlehem as a result of poor sanitation and toilet facilities.

Selloane Molakeng reported on a five-year-old girl who had been hit by a car and died while waiting to be attended to by nurses at Phekolong Hospital in Bethlehem. Only two nurses were on duty in the casualty department and no beds were available.

From KwaZulu-Natal, Lungile Ngubane has focused mainly on organisations and people trying to improve communities around Howick in the Midlands. One example is Ethembeni Care Centre, which provides free medical assistance and distributes food parcels to people in Mpophomeni.

Edendale-based Thandiwe Mazanqinzi-Zamisa has drawn on her own experiences as an HIV-positive mother and a counsellor for HIV-positive pregnant women for her stories.

In Tshwane, Mishack Mahlangu has reported on a number of organisations in Winterveldt that face closure because they no longer receive funding from the President’s Emergency Plan for AIDS Relief. These include the Winterveldt HIV/AIDs Project, which cares for 1 200 orphans, and Hope for Life, which provides antiretroviral treatment and social support to 1 200 people living with HIV.

All the stories are loaded onto the Health-e website, which has a daily average of 12 600 visitors and had an annual page-view readership of 4.6 million in 2012.

When Health-e staff members met Health Minister Dr Aaron Motsoaledi in November 2011 to discuss the OurHealth project, he was enthusiastic about it as an example of how civil society could monitor government service delivery. He asked that the citizen journalists establish contact with the Ombudsperson offices being set up in all the provinces. This, he said, would ensure that serious issues and complaints could be dealt with immediately by health officials.

Since the launch of OurHealth, the Department of Performance Monitoring and Evaluation in The Presidency has contacted Health-e and is considering OurHealth as a pilot for citizen monitoring of government service delivery.

After three months of operating, OurHealth has a stable group of citizen reporters. It can now formalise links with district health officials and start to put pressure on them to report back on progress made to address problems identified.

OurHealth journalists will also take part in the Tendai project, a partnership that is working in 15 Southern African Development Community (SADC) countries to improve access to essential medicine. Tendai is coordinated by the Southern Africa Regional Partnership on Access to Medicines and Diagnostics, which is collaborating with the SADC Secretariat to implement its pharmaceutical business plan.

As part of the project the journalists will each be assigned to a small number of clinics and will visit the pharmacy at the clinic once a month to check on the supply of 12 essential medicines. At present, these medicines are Acyclovir, Amphotericin, Cotromoxazole, Efavirenz, Fluconazole, Lopinovir/Rotinavir, Morphine, Paracetamol, Rifampicin, Isoniazid, Tenofovir and Zinc Sulphate.

The journalists will send monthly reports to Tendai via mobile phones preloaded with a reporting template. The phones will have a geographic positioning system that captures the location and confirms that the journalists have actually visited the clinics.

The OurHealth project is currently being run on a tight budget, with support from the DG Murray Trust and The Atlantic Philanthropies. However, many possibilities exist for groundbreaking citizen reporting on health service delivery that will ensure that serious district-level grievances and successes receive the profile and attention they deserve.

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Mainstreaming the Social Determinants of Health in South Africa: Rhetoric or reality?

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This chapter provides an analytical perspective on the discourse and action focusing on the social determinants of health (SDH) in South Africa and aims to provide insights into the complexities of practical action on the SDH. It is based on a rapid appraisal of government policy documents and budget speeches, combined with interviews with 10 purposively selected key informants.

Discussion on the SDH from the health sector is encouraging, with the Negotiated Service Delivery Agreement recognising the importance of addressing “upstream” factors (e.g. SDH) that impact on health. All of the provinces have articulated the importance of the SDH, and have listed structural mechanisms, ranging from more narrow bilateral departmental arrangements (e.g. between health and social development) to an overall philosophical approach of integrated planning and a ‘whole of society’ wellness approach. However, no prioritisation of the many intersectoral initiatives is apparent, which leads to doubt about the ability and capacity of government as a whole, and the health sector in particular, to make measureable progress. Interviews with key informants revealed numerous constraints, including problems of policy design, governance and leadership of SDH, gaps between policy and implementation, insufficient resources, and a lack of monitoring and evaluation.

Nonetheless, the global movement on SDH and developments within the country create an enabling environment for more concrete action. Moving beyond rhetoric requires the following activities: good epidemiological information and clear indicators that can be used to monitor disease trends and progress on SDH over a period of time; comprehensive community-based prevention programmes; involvement of communities and various stakeholders in intersectoral activities; legislative and structural interventions to address more underlying determinants; innovative media campaigns; and monitoring and evaluation of the SDH. All of these require dedicated financial and human resources. Finally, a more critical SDH discourse is needed – one that interrogates and addresses the structural determinants of health inequities and the unequal power relationships that exacerbate such inequities.

The global movement on social determinants of health and developments within the country create an enabling environment for more concrete action.

Introduction

In the past decade, there has been a resurgence of interest in action to address the social determinants of health (SDH), in part a response to the persistent health inequities between and within countries; changing disease profiles and the complexity thereof; and inadequate or poorly performing health systems.¹⁻⁴ The SDH are:

the social and economic factors that influence health, and include income, education, social safety networks, employment and working conditions, unemployment and job security, early childhood development, gender, 'race', food insecurity, housing, social exclusion, access to health services, and disability.¹

These factors are, in the main, influenced by government policies and practices of resource allocation and distribution, as well as legislation that reinforces or counters harmful social norms.¹ As such, there is value in reviewing how the SDH are acknowledged and addressed by government, in this case using the health sector as a departure point.

In South Africa (SA), notwithstanding huge social and economic transformation since the democratic elections in 1994, the country remains one of the most unequal in the world.^{5,6} Gender, 'race' and geographical location remain the key markers of social and economic inequities and of poor health outcomes.^{7,8} These inequities are exacerbated by the concomitant challenges of a quadruple burden of disease and the sub-optimal performance of the health system.^{7,9-19}

In response to these problems, the Minister of Health signed the Negotiated Service Delivery Agreement (NSDA) for the Health Sector in October 2010.²⁰ In terms of the NSDA, the four strategic outputs for the health sector are: increasing life expectancy; decreasing maternal and child mortality; combating HIV and AIDS and decreasing the burden of disease from tuberculosis (TB); and strengthening health system effectiveness.²⁰ The re-engineering of primary health care (PHC) is at the core of revitalising and strengthening the health system.^{20,21} The principles of the re-engineered system are: a population-orientation to health care; meeting priority health needs in a comprehensive manner; improving health outcomes; developing a well-functioning district health system; and a focus on the "upstream" factors that impact on health; i.e. the SDH.²² It is on this final principle that we focus in this chapter.

The chapter provides an analytical perspective on the discourse and action, focusing on the SDH in SA within the health sector and aims to provide insights into the complexities of practical action on the SDH. The chapter combines an analysis of government health policy documents and budget speeches with interviews with 10 purposively selected key informants from national and provincial health departments. The interviews explored: knowledge of key global developments in SDH; whether the attention being paid to the SDH over the past few years is simply rhetoric, or whether there is real action on SDH as a means of improving population health and reducing health inequities. The first part of the chapter focuses on key global developments in SDH and the extent to which the discourse centering on SDH is reflected in the NSDA. This latter document was selected as it provides the foundation for health ministerial action and the subsequent development of health

sector policies; for example, the Green Paper on National Health Insurance (NHI)²³ and the Human Resources for Health (HRH) strategy.²⁴ The second section of the chapter explores intersectoral action taken on the SDH, and what is being done at national and provincial government levels in SA to address the SDH. The section also looks at constraints or barriers that impede progress. The final section highlights successful intersectoral initiatives both in SA and elsewhere and draws out lessons for the country on practical action on the SDH.

Overview of global developments on SDH

In 2005, the World Health Organization (WHO) set up the Commission on Social Determinants of Health (CSDH) to collect and synthesise the evidence on what can be done to address the SDH, promote health equity, and foster a global movement to achieve it.¹ The CSDH presented its final report in 2008 and made three over-arching recommendations:

- improve daily living conditions – i.e. the circumstances in which people are born, grow, live, work, and age;
- tackle the inequitable distribution of power, money, and resources (i.e. the structural drivers); and
- measure the problem, evaluate action, expand the knowledge base, develop a workforce that is trained in the SDH and raise public awareness about the SDH.¹

This emphasis on SDH is not new, as can be seen from Table 1, and was first highlighted as far back as three decades ago.

Table 1: Timeline of high-level key global developments in SDH

Year	Milestone	Highlights
1978	Alma-Ata Declaration on PHC ^{25,26}	<ul style="list-style-type: none"> Emphasises values of equity, social justice and health as a fundamental human right Expresses the need for urgent action to protect and promote the health of people PHC strategies include access to: good quality health care – including preventive and promotive services – intersectoral action to address the root causes of ill-health and enhanced community participation and accountability
1986	Ottawa Charter for Health Promotion ²⁷	<ul style="list-style-type: none"> Focuses on health promotion Reaffirms values of equity in health as a fundamental right Emphasises that achievement of health goes beyond the health sector Highlights the importance of intersectoral action
2000	Millennium Declaration ²⁸	<ul style="list-style-type: none"> Global attempt at addressing unacceptable inequalities within and between countries Consists of eight Millennium Development Goals (MDGs) and 20 development targets to be achieved by 2015 MDGs range from eradicating extreme poverty to developing a global partnership for development
2008	CSDH ¹	<ul style="list-style-type: none"> Emphasises the values of equity and social justice Synthesises evidence of SDH, and includes action needed at local, national and global levels Focuses attention on the structural drivers of inequality and the need for ongoing measurement, monitoring and evaluation of health inequalities
2009	World Health Assembly Resolution 62 ²⁹	<ul style="list-style-type: none"> Focuses on the reduction of health inequities through action related to the SDH
2011	Rio Political Declaration on SDH ³	<ul style="list-style-type: none"> Reiterates WHO member states' commitment to achieve social and health equity through action on SDH and a comprehensive intersectoral approach Endorses five priority action areas of: improved governance at national level; community participation; re-orientation of the health system to address equity; strengthened global governance and collaboration; and accountability and monitoring of progress
2012	65th World Health Assembly	<ul style="list-style-type: none"> Endorses the recommendations of the Rio Declaration
2012	Declaration of the Third People's Health Assembly ³⁰	<ul style="list-style-type: none"> Identifies the neo-liberal model of globalisation as the root of the global health crisis Endorses collective global and local action to transform prevailing social, political, and economic systems and structures that entrench and exacerbate health inequities

Notwithstanding all these global developments, more than 30 years after the Alma-Ata PHC Declaration, the goal of “health for all” remains elusive in many countries and huge inequities remain between and within countries.^{1,25,31} But to what extent is the SDH reflected in current health care reforms?

The NSDA is explicit in the linkages between the disease burden and health system effectiveness on the one hand and the SDH on the other.²⁰ The NSDA reiterates the importance of the PHC approach as enunciated at Alma-Ata and the need for an intersectoral approach in order to improve health outcomes. The NSDA emphasises that the “improvement of the health status of all South Africans is a responsibility that cuts across a number of sectors, both internal and external to the government systems and processes and not just the Department of Health.”²⁰ The document is impressive in the listing of key partners and stakeholders, both at national and international levels, in the implementation of each of the NSDA output areas.²⁰

Table 2 summarises the four key outputs and associated targets of the NSDA, the extent to which the SDH are reflected in the situational analysis and the proposed activities to address the SDH.

Table 2: Summary of outputs and targets of the NSDA and links to SDH

NSDA output	Target for 2014, with 2009 baseline values	Specific SDH identified in NSDA	Proposed activities to address SDH
1 Increase life expectancy	Increase life expectancy from 53.9 to 58 years for males and 57.2 to 60 years for females	<ul style="list-style-type: none"> Globalisation (international travel and trade) as source of communicable disease threats, such as malaria Intersectoral action required to address the burden of disease resulting from violence and injuries Highlights that increased access to prevention, screening and early detection and effective management of diseases will improve life expectancy 	<ul style="list-style-type: none"> Collaboration with neighbouring countries to prevent malaria Lists specific intersectoral actions and initiatives for prevention or early detection of non-communicable and chronic diseases Specifies the need for plans to improve and expand healthcare access and preventive and promotive health services
2 Decrease maternal and child mortality	Decrease under-five mortality rate from 104 to ≤ 20 per 1 000 Decrease infant mortality rate from 53 to ≤ 18 per 1 000 Decrease maternal mortality rate from 625 to ≤ 100 per 100 000	<ul style="list-style-type: none"> Notes the links between child mortality and the SDH such as clean water, sanitation, child protection, and poverty and child mortality Highlights links between SDH and mental health Gender power imbalances identified as limiting women's reproductive and sexual health (RSH) options, exacerbated by limited (or late) access to quality RSH care Unavailability of transport linked to preventable child and maternal deaths 	<ul style="list-style-type: none"> PHC re-engineering to increase access to and improve quality of RSH care 'Tangible' improvements in health system effectiveness, including promotive and preventive services and a functional referral system (Re)design rural facilities to reduce need for transport Campaigns to de-stigmatised abortion
3 Combat HIV and AIDS and decrease the burden of disease from TB	Reduce new HIV infections by 50% Eighty percent access for all those eligible for highly active antiretroviral therapy (HAART) Increase TB cure rate from 64% to 85%	<ul style="list-style-type: none"> HIV among women and mother-to-child transmission linked to gender power imbalances TB linked to overcrowding and poor social conditions Improved health system effectiveness needed 	<ul style="list-style-type: none"> Promote and facilitate open dialogue among communities, civil society and social partners to address the SDH to reduce stigma and proactively address gender issues that put women at risk Improve health system effectiveness, notably PHC re-engineering and increasing early access to prevention and care as well as accountability by integrating HIV and TB services Intersectoral focus on high risk areas for TB control
4 Strengthen health system effectiveness	Re-engineer PHC Implement NHI system	<ul style="list-style-type: none"> Recognition that changes must be coupled with the existence of reliable and equitable access to decent housing, clean water, sanitation, nutrition and education Calls for community participation and intersectoral collaboration in the provision and delivery of healthcare services 	<ul style="list-style-type: none"> Overhaul the health services delivery platform Improve management and supervision Improve physical infrastructure to motivate health workers to provide better care Accredit of health facilities through an independent body and improve patient satisfaction and quality of care Include non-health stakeholders in planning for human resources for health Resources to ensure community involvement in governance structures

Source: Adapted from: National Department of Health, 2010.²⁰

As can be seen from Table 2, the NSDA recognises the importance of addressing the SDH. Some identified health determinants are linked to clear actions; e.g. providing ambulances to address unavailable transport for mothers requiring higher-level care. However, other determinants have less clear corresponding actions, such as gender power imbalances that make it difficult for women to access reproductive services. Furthermore, while intersectoral actors are identified for each output, the specific areas of collaboration and mechanisms for intersectoral action not described in the NSDA.

In light of the well-recognised gaps between policy and implementation, the next section of the chapter explores intersectoral action focusing on the SDH, and what is being done at national and provincial government levels in SA to address the SDH. Barriers that impede progress are also explored.

Action on SDH: progress and challenges

Overall, the establishment and deliberations of the National Planning Commission present an important country-level initiative to ensure integrated planning, development and implementation to “address the social determinants that affect health and disease”.³² The initiative provides a broad strategic framework to guide key choices and actions, and is explicit on the need to address the SDH. However, the section on the SDH is somewhat limited on the proposed actions, which include a comprehensive approach to early life (i.e. early childhood development) collaboration across sectors and healthy diets and physical activity.³²

This section examines the discourse on SDH through the lens of the health sector. The approach taken was to analyse the 2012 budget speeches of the national Minister of Health and the provincial health Members of Executive Councils (MECs) for a focus on the

SDH, especially for SDH-related strategies. The budget speeches were selected, as these documents tend to review progress against the budget for the previous year (2011/12) and they map out key strategic priorities for the following financial year (2012/13).³³⁻⁴²

There are several limitations in analysing these budget speeches. First, these are political documents that tend to highlight achievements and service delivery for the money spent in the previous financial year and that justify intended actions for the new budgets allocated. For this reason, the speeches would tend to downplay challenges or non-delivery. Second, proposed actions or strategies do not always translate into actual implementation and the extent to which budget speeches accurately reflect back on previous commitments varies. Third, the analysis might be generous in attributing actions or activities to the SDH because of lack of detail or specifics in the budget speeches. For example, reference to alcohol control to deal with non-communicable diseases (NCDs) would only be an SDH issue if the control measures included addressing the upstream factors, such as restricting industry advertising.

Notwithstanding these limitations, an analysis of budget speeches provides useful insights into the complexities of practical action on the SDH (Table 3). The analysis was conducted, using an analytical framework for intersectoral governance, proposed by McQueen et al.⁴³ The framework consists of two, overlapping domains: intersectoral governance structures, and governance actions. Governance structures include ministerial linkages, cabinet committees and secretaries, parliamentary committees, inter-departmental committees and units, joint budgeting, delegated financing, public, stakeholder and industry engagement. Governance actions include evidence support, setting goals and targets, coordination, advocacy and monitoring and evaluation. Policy guidance, financial support, providing legal mandate and implementation and management would be other governance actions.

Table 3: Extent to which SDH is reflected in ministerial budget speeches

Institution	Intersectoral governance structures	Governance action
National Department of Health	<ul style="list-style-type: none"> • Intersectoral structures not explicitly mentioned • Parliamentarians should be called on to assist with: addressing social structural drivers of HIV, STIs and TB; prioritising prevention; sustaining health and wellness; and ensuring protection of human rights and access to justice 	<ul style="list-style-type: none"> • NSDA and challenges of disease burden and health system constitute core focus • Lists new strategic plan on HIV, AIDS and TB, which expresses a 20-year vision for combating disease burden due to HIV and TB • Provides information on the nature of NCDs and their risk factors • Alcohol control as major initiative to deal with NCD risk factors • Specific measures to improve health system effectiveness; e.g. Office of Health Standards Compliance to improve quality of care, universal coverage through NHI in pursuit of equity and social justice
Eastern Cape	<ul style="list-style-type: none"> • Multi-agency working group to ensure a corruption-free department and public service • Improved working relationship between the Department of Health (DoH) and Office of the Premier and Public Service Commission • Engaging communities in PHC 	<ul style="list-style-type: none"> • Highlights the links between education initiatives and provision of quality health care, and importance of preventative and promotive health • Lists DoH's contribution to creation of decent work and the fight against crime and corruption • Highlights importance of water to the functionality of health facilities, especially in rural areas • Rollout of the community-based TB model • Lists provincial efforts with NSDA outcomes
Free State	<ul style="list-style-type: none"> • Mentions spirit of collective effort and partnerships • Establishment of Traditional Practitioner's Health Committee • Strengthen provincial council on AIDS and support to district and local AIDS councils • Partnership with people living with AIDS and civil society organisations • Partnership with private sector to train nurses 	<ul style="list-style-type: none"> • SDH or joint action not explicitly mentioned • Lists provincial efforts with NSDA outcomes and re-iterates NSDA targets as priorities • List achievements on HIV prevention • Implementation of school health services • Integrated school health services will focus on quintile one and two schools in collaboration with provincial departments of education, social development and local municipalities in community settings
Gauteng	<ul style="list-style-type: none"> • Collaboration with provincial social development and rural development departments to assist with poverty-alleviation projects • Service level agreements with municipalities to deliver emergency medical services • Collaboration with provincial infrastructure development and finance departments to ensure optimal support for infrastructure management • Appointment of hospital boards and mental health review boards to ensure governance of hospitals • Need to ensure responsiveness to community expectations 	<ul style="list-style-type: none"> • SDH or joint action not explicitly mentioned • List provincial efforts with NSDA outcomes • Report on turn-around strategy with five pillars: strategic leadership and desirable organisational culture; environmental controls for good governance; communication and social mobilisation; human resources management and development; and health infrastructure development and rehabilitation • Strengthen PHC approach with increased focus on health promotion and prevention of infectious and chronic diseases • Note that defining features of community-based services are promotion of healthy lifestyle by emphasising healthy diet, physical exercise, stopping smoking, responsible use of alcohol, and responsible sexual behaviour
KwaZulu-Natal	<ul style="list-style-type: none"> • Collaboration with traditional initiation schools and with the Amakhosi on HIV prevention activities and other health issues • Establishment of support groups for people living with HIV • Collaboration between departments of health and social development to ensure an integrated community care giver model which will assist in addressing problems faced by communities • Close collaboration with non-governmental organisations • Establishment of a Provincial Health Council to promote integration of services between the provincial and local spheres of government • Engagement with and beneficiary of investment of the private sector regarding infrastructure development • Bilateral government partnerships with Denmark and Taiwan regarding rehabilitation services • Service level agreement with disabled people of SA – KZN to provide community-based rehabilitation services • Partnership with local radio station and church to provide additional wheelchairs 	<ul style="list-style-type: none"> • List provincial efforts with NSDA outcomes and re-iterate NSDA targets as priorities • Encourage healthy lifestyles through health promotion • Launch of integrated wellness and healthy lifestyle programmes for own employees at different levels of health system • Launch of anti-sugar-daddy awareness campaign to encourage community leadership and stigma of older men who seek sex with young girls, particularly those between the ages of 14 and 21 • HIV prevention campaign • List the DoH's contribution to creation of decent work • Oral health promotion outreach programmes in schools

Institution	Intersectoral governance structures	Governance action
Limpopo	<ul style="list-style-type: none"> • Call on all to work together in partnership to reach the goal of improving the health profile of all South Africans • Engagement with and beneficiary of investment by the private sector regarding infrastructure development • Host of the Southern African Development Community (SADC) Malaria Day 	<ul style="list-style-type: none"> • List provincial efforts with NSDA outcomes and targets and reiterate priorities • Highlight provincial priorities to: step up vaccinations; enhance capacity to control infectious diseases; re-introduce family planning delivery; recognise tobacco use as a health hazard; and ensure decline in deaths from coronary heart diseases and stroke • Highlight PHC as a people-centred approach to health that makes prevention as important as cure and that tackles the root causes of ill health • Strengthen public education efforts to encourage people to use PHC clinics • Recognise obesity; lack of exercise (physical inactivity); unhealthy diets including excessive salt intake; tobacco use and harmful use of alcohol are serious health hazards and require 'serious action' if NCDs are to be prevented • Announce public campaigns against alcohol and tobacco use, advocate for the reduction of salt intake, and promote public awareness about diet and physical activity, in support of national efforts announced by the Minister of Health • Announce free health (screening) tests at all strategic locations in the province, including farms, taxi ranks, and shopping malls • Encourage corporates, government departments and entities including the Limpopo Provincial Legislature to set aside at least an hour once a week for physical activity • Initiation of health walk and aerobics sessions for staff members
Mpumalanga	<ul style="list-style-type: none"> • Establishment of hospital boards and clinic committees 	<ul style="list-style-type: none"> • Note the need to improve the general living conditions of people • Stress that poverty not only undermines the dignity of people, but that it is also a negative SDH • List provincial efforts with NSDA outcomes, as well as progress • Note that the key approach to management of HIV is prevention • Recognise importance of positive lifestyle including but not limited to safe sex, avoiding smoking and excessive use of alcohol, good nutrition and exercise • Emphasise centrality of health promotion
Northern Cape	<ul style="list-style-type: none"> • Mention collaboration between health and education as an intersectoral activity • Launch of Provincial Strategic Plan for HIV, STIs and TB 2012 – 2016 with partners that include the Provincial AIDS Council, community and religious groups • Engagement with and beneficiary of investment by the private sector regarding infrastructure development 	<ul style="list-style-type: none"> • Note linkages between equity, social justice and health • Reiterate provincial support for NSDA outcomes, progress and importance of NSDA targets and strategies • Recognise that focus on prevention and health promotion is essential for tackling the burden of disease • Note the importance of dealing with the economic determinants and SDH in order to combat TB • Indicate that PHC teams are critical in the war against poverty • Reiterate the importance of gender equality and women's emancipation for their health • Report on installing hot water solar systems at community health centres as part of the effort towards energy efficiency and to reduce greenhouse emissions
North West	<ul style="list-style-type: none"> • Engagement with and beneficiary of investment by private sector regarding infrastructure development • Acknowledge contribution made by developmental partners, community-based organisations, traditional leaders and healers, faith-based organisations and the private sector • Collaboration with the Department of Social Development, women, children and people with disabilities on profiling of households • Acknowledge contribution of Home Affairs and National Prosecution Authority and academic partners to health 	<ul style="list-style-type: none"> • List provincial efforts with NSDA outcomes and targets and reiterate priorities • Only mention prevention and health promotion in context of NHI package of services

Institution	Intersectoral governance structures	Governance action
Western Cape	<ul style="list-style-type: none"> List public-private partnerships Establishment of an independent health foundation Establishment of six working groups on violence and road injury prevention; healthy lifestyles; women's health; maternal and child health; infectious diseases (HIV and TB); and mental health Working groups coordinated through the Provincial Transversal Management System, in support of the strategic objective of increasing wellness Mention various structures such as facility boards, clinic committees, health forums and district health councils for the purpose of working better together 	<ul style="list-style-type: none"> Budget speech framed from an economic perspective Report on wellness summit, hosted by premier, and attended by different stakeholders, with the aim of reducing the burden of disease Stress the shift in focus from curing illness to one of promoting and seeking wellness Introduce the notion of wellness clinics focusing on healthy lifestyles, early detection, prevention and referral for treatment and funded by the private sector Note that the department will focus on strengthening its advocacy role to ensure that the upstream factors are addressed by the appropriate departments and stakeholders Provincial progress on national health priorities Indicate that the focus of PHC will be on the prevention of disease and the promotion of health or wellness, in particular: maternal and child health; chronic diseases of lifestyle, including the impact of substance abuse; mental well-being; and infectious diseases such as HIV and AIDS, and TB. Indicate that building of future health facilities will be environment friendly and energy efficient Indicate support for draft provincial legislation to ensure the safety of children in transport

Notwithstanding the limitations of analysing budget speeches noted earlier, the key issues that emerge from this assessment are:

- institutionalisation of the NSDA (itself seen as a mechanism to encourage intersectoral action) in all provinces, with progress reported on some or all of the NSDA outcomes;
- recognition of the linkages between current disease burden and the SDH;
- existence of numerous intersectoral structures, more in some provinces than others, although the effectiveness of these is not known;
- emphasis on disease prevention and health promotion that include approaches targeting the SDH; and
- health system challenges and efforts to improve its functioning and effectiveness at reaching all segments of society in all the budget speeches.

Interviews with key informants revealed that the establishment of structures or mechanisms for intersectoral action appears to be the most visible demonstration of 'action' on the SDH. The 'cluster' system of government is operational in all provinces. These provincial social clusters include the Departments of Health, Education, and Social Development, and focus on matters pertaining to 'all social services'. In the Western Cape the Provincial Transversal Management System (PTMS) provides a structured mechanism to mobilise role players outside of the health department to address the SDH. The PTMS has reportedly been prioritised by the Provincial Cabinet, which gives 'political weight' to intersectoral collaboration. The philosophy is of "thinking and acting in a united and coordinated way around a common set of objectives as a whole of society and a whole of government". For example, the Healthy Lifestyles Workgroup includes all relevant line departments and its activities focus on schools, workplaces, and community settings. Another example is the Violence Prevention through Urban Upgrading (VPUU) project, led by the City of Cape Town, which is a holistic approach to urban upgrading that is unique in the Cape Town context in the way that it has integrated all forms of development and not only the physical upgrading. VPUU aims to reduce violent crime and improve social conditions in communities across the Cape Flats.

In Gauteng, the intersectoral AIDS programme has been in operation for more than a decade, and the stewardship is provided by the DoH. The key elements of the Gauteng provincial AIDS strategy include multisectoral partnerships, social mobilisation and communication; prevention, treatment and care; and leadership and programme organisation. The Integrated Development Planning (IDP) structures are seen as a vehicle to address the SDH, although it was pointed out that the SDH is not a regular item on the agenda of IDP structures. Other initiatives that started a few years ago include the War on Poverty Programme, coordinated by the Department of Social Development, and the Integrated Nutrition Programme coordinated by the Department of Agriculture.

In KwaZulu-Natal, the Premier is reported to have implemented a successful *Sukuma Sakhe Programme* (Stand up and let's build!). Each mayor in the province is responsible for the entire integrated development of the municipality, and the various MECs have been directed to adopt a municipality, and to take a keen interest in the overall development of the entire municipality and not just the function for which the MEC is responsible. The Premier of the Free State has also established *Operation Hlasela*, which means 'attack poverty in all its manifestations'.

At face value, these developments look impressive, and the language of SDH has found its way into government structures and action plans. But what are the barriers to intersectoral action to address the SDH? These are shown in Table 4 and are based on interviews with key informants.

Table 4: Reported barriers to intersectoral action and addressing the SDH

Constraint/ barrier	Brief description
Legislation or policy design	<ul style="list-style-type: none"> The amended National Health Act does not address SDH, making it difficult for the various budget programmes to deal with it. Health inequities are highlighted in all strategic plans, but precise action or interventions to address health inequities has never been an explicit focus of government's health policy agenda The NSDA, strategic plans and the annual performance plans and indicators highlight the SDH, but there is limited guidance on how the SDH can be addressed in an integrated manner Unrealistic expectations of community health workers to identify health problems early on and prevent diseases when many of the problems stem from the difficult structural issues of unemployment, poverty, and income disparities that the health sector cannot address directly
Governance and leadership	<ul style="list-style-type: none"> Weak governance in government institutions General lack of political champions of SDH Lack of accountability and sub-optimal performance management Silo planning and implementation of separate government, private sector- and non-governmental organisations action hinder an integrated approach to addressing SDH Lack of community involvement and lack of awareness on SDH Poor or lack of functioning of existing governance structures (e.g. clinic committees, hospital boards) that could be mobilised to address SDH
Gap between policy and implementation	<ul style="list-style-type: none"> Although health policy is geared towards PHC, historically the bulk of spending was on curative, highly specialised tertiary care Prevention actions remain largely focused on individual awareness raising or behaviour change; e.g. HIV counselling and testing versus SDH Disjointed or lack of integrated implementation in some instances that minimises potential impact
Lack of or insufficient resources and resourcing	<ul style="list-style-type: none"> Mis-management of existing government resources Lack of integrated budgeting, and separate budget votes for each line department Lack of additional resources (staff and money) for integrated activities Time required to attend all the meetings of intersectoral committees or work groups
Lack of monitoring and evaluation	<ul style="list-style-type: none"> Absence of updated/current and credible baseline demographic information to inform decision making Lack of clear indicators on SDH

A perspective that did not emerge in the interviews or the budget speeches is the role of structural drivers of health outcomes or inequities, such as global trade agreements, or broader income or educational inequities. However, this is probably the result of the limited number of key informants interviewed, who are all working in government. Nonetheless, the experience in other countries as well as SA has shown the importance of addressing such factors. In the next section lessons to move towards concrete action to address the SDH are presented.

Moving towards concrete action to address the SDH

SA and other countries show successful intersectoral action to address the SDH. The budget speeches reveal promising examples, which may provide examples of best practice in years to come.

The country's more recent approach to dealing with the HIV epidemic provides a good example of intersectoral action to overcome the challenges of a catastrophic HIV epidemic. This approach includes good government leadership and stewardship; establishment of intersectoral structures and action that unite different stakeholders towards a common purpose; increasing resource allocation to combat the epidemic; capacity building within and outside government; addressing structural drivers (e.g. tackling the pharmaceutical industry to reduce the price of antiretroviral medicines); confronting harmful social norms and individual behaviours (e.g. promoting condom use); and genuine community participation and involvement of people living with HIV. The results are evident from a stabilising epidemic, increasing life expectancy, a vast reduction in mother-to-child-transmission of HIV and a reduction in stigma and discrimination.⁴⁴

Another South African example is legislation to reduce tobacco use that makes the healthy choice the easier choice. Tobacco use is a risk factor for six of the eight leading causes of death and is the leading preventable cause of death in the world. The most effective intervention against tobacco use is a combination of tobacco taxation, bans of tobacco sales to teenagers, comprehensive bans on advertising and dissemination of health information on the dangers of smoking, all contained in South African legislation. A 26% drop in tobacco consumption between 1993 and 2002 has been attributed to this legislative action and a sharp increase in excise taxes.⁴⁵ The government decision to address the policy environment instead of individual behaviour to abstain from or reduce smoking illustrates an SDH approach that recognises the role of structural drivers (e.g. the tobacco industry) in promoting harmful products and individual behaviours.

SA is taking action to address population health through public health policy is that of the recently gazetted draft regulations⁴⁶ that address the salt content of processed food, including bread. Drawing on epidemiological evidence that hypertension in SA was increasing, in part due to high salt intake, bread was identified as one of the most significant sources of non-discretionary salt intake.⁴⁶ Economic modelling demonstrated the health impact of reducing salt content at the point of manufacture.⁴⁷ Importantly, early engagement with the food industry enabled identification of salt reduction that could be achieved without significantly affecting the taste of the food products, thus reducing industry opposition. As a result, the legislation is expected to reduce salt levels at the stage of production with consequent reductions in the proportion of individuals developing hypertension in the population. Like SA's tobacco control legislation, this strategy makes the healthy choice the easier choice without sole reliance on changing individuals' eating habits which would be much harder to achieve.

SA can also learn from successful intersectoral action in other low- and middle-income countries (LMIC). The City without Slums Arusha initiative in Tanzania introduced a community development committee mechanism that allowed community-led prioritisation of environmental issues that could be addressed internally, and identification of those issues that required external interventions. By allowing community members a seat on governance councils, accountability to Arusha's slum dwellers was improved and key infrastructure and sanitation measures were introduced that involved the participation of both local and external actors.¹ In Uganda, the Katine Community Partnerships Project (KCCP) was a partnership between the Guardian Newspaper in the United Kingdom, Barclays Bank, the African Medical and Research Foundation and local government in the Soroti district in Northern Uganda.⁴⁸ The overall goal of the five-year KCCP, which commenced in October 2007, was to improve the well-being and quality of life of people living in Katine through an integrated and community-based development approach to address the underlying SDH. The project consisted of five interlocking components designed to increase access to: improved community health; quality education delivered in improved schools; safe water and sanitation within easy reach of homesteads; modern farming methods and new income-generating opportunities; and community empowerment to increase engagement in local governance to achieve sustainability. The project achieved significant results in the five-year period, including a 29% increase in primary school enrolment, with the enrolment in the number of girls exceeding that of boys for the first time in 2009 and 2010; increased immunisation rates and antenatal attendance; increased coverage with safe water and sanitation; and increased income generation of communities. A by-product has been the increased economic independence of women, resulting from their access to increased income and sustainable livelihood activities.⁴⁸

In Thailand, the Thai Health Promotion Foundation (ThaiHealth) was established in 2001 as a statutory, independent public organisation.⁴⁹ Funding comes from a 2% excise tax on alcohol and cigarettes. ThaiHealth has played a leading role in the movement against tobacco use, with proceeds from the tax also being used to fund campaigns to prevent drunken driving and to reduce alcohol consumption and activities to promote physical activity.⁵⁰

While the experience of countries with developed economies is very different to that of LMICs, it is nonetheless useful to examine selected examples. In North Karelia in Finland, a comprehensive community-based prevention programme was implemented in 1972 in response to the exceptionally high coronary heart disease mortality rates in the area. The experience over a 25-year period has shown that epidemiological information on prevalence and risk factors combined with carefully planned community-based programmes, re-orientation of health and other social services, school-based programmes, innovative media campaigns and intersectoral action to address modifiable risk factors were critical in achieving the reduction in chronic disease mortality and its risks.⁵⁰ Communities were integrally involved and stakeholders included local and national authorities, and various 'experts'.^{50,51} These initiatives have been supported by public health legislation and a comprehensive monitoring and evaluation system was part of the programme.^{50,51}

In British Columbia in Canada, the ActNow BC is a cross-government health-promotion initiative that aims to improve the health of British Columbians by taking steps to address common risk factors and reduce chronic disease, in light of research that found that inactivity, poor nutrition, overweight and obesity, tobacco use and unhealthy choices in pregnancy were the key risk factors contributing to the main chronic disease categories in the area.⁵² ActNow BC is led by the Ministry of Health and involves all provincial ministries as well as key external partners. The programme supports schools, employers, local governments and communities to develop and promote programmes that make healthy choices the easy choices for all British Columbians. For example, the Community Food Action Initiatives support the development and implementation of community food security plans and activities that improve access to safe, culturally acceptable, nutritionally adequate diets through a sustainable food system. As part of ActNow BC, the Union of BC Municipalities is also leading initiatives to support communities in developing healthy public policies and to encourage public leaders to talk about healthy planning in their communities.⁵²

The key factors for successful intersectoral action that emerge from this analysis are highlighted in Box 1 below.

Box 1: Ingredients for successful intersectoral action to address the SDH

- ❖ Legislation and/or policy design and structural interventions to address more underlying determinants (e.g. power imbalances, trade agreements)
- ❖ High-level political stewardship and leadership, combined with awareness among and support from civil servants responsible for implementation
- ❖ Diverse strategies and mechanisms to foster collaboration in government
- ❖ Dedicated financial and human resources
- ❖ Strong partnerships with civil society organisations, including involvement of affected or relevant communities in intersectoral activities
- ❖ Good epidemiological information and clear indicators that could be used to monitor disease trends and progress on SDH over a period of time
- ❖ Balancing planning and action on the ground
- ❖ Comprehensive community-based prevention programmes
- ❖ Innovative media campaigns targeting all sectors of society
- ❖ Monitoring and evaluation of the SDH

Conclusion

In this chapter, we have set out to review whether mainstreaming of the SDH in SA is merely rhetoric or whether there has been significant action to address the SDH. The approach was a rapid review, combining limited key informant interviews with an analysis of the NSDA and budget speeches. An alternative approach for future appraisals may be to review provincial planning processes and annual reports to analyse action. Similarly, reviewing budget speeches of non-health sector MECs (e.g. transport, environment) could give insight into the extent to which health is mainstreamed into other sectors where the SDH are prominent. Indeed, there are a number of tools and indices, some validated, which could be used to track SA's progress on addressing the SDH.⁵³ These include checklists and tools for the assessment of health equity impact, gender analysis, support structures and decision making, intersectoral action and policy analysis.⁵³

Notwithstanding the limitations of our rapid review, we have found that there is encouraging rhetoric on SDH, with the NSDA recognising the importance of addressing the SDH. In addition to the national minister's budget speech, all the provincial budget speeches have articulated the importance of SDH, and have listed structural mechanisms, ranging from more narrow bilateral departmental arrangements (e.g. between health and social development) to an overall philosophical approach of integrated planning and a 'whole of society' wellness approach found in some provinces. However, it is not possible to comment on the functioning of these structures or their effectiveness in achieving the desired health impact. There does not appear to be any prioritisation of the many intersectoral initiatives, thus raising doubt as to the ability and capacity of government as a whole, and the health sector in particular, to make measureable progress. Interviews with key informants revealed numerous constraints, including problems of policy design, governance and leadership of SDH, gaps between policy and implementation, insufficient resources, and a lack of monitoring and evaluation.

The global movement on SDH and developments within SA create an enabling environment for more concrete action. There is a great deal that can be learned from the experience both from within SA and from other countries that will move beyond rhetoric. Specifically, this reality must include the following activities: good epidemiological information and clear indicators that can be used to monitor disease trends and progress on SDH over a period of time; comprehensive community-based prevention programmes that address SDH; involvement of communities and various stakeholders in intersectoral activities; legislative and structural interventions; innovative media campaigns, and monitoring and evaluation of SDH.

More research evidence is needed both on the SDH and to support action to address them. While recommending a comprehensive research agenda goes beyond the scope of this chapter, possible research areas include: the impact of structural determinants on population health outcomes; demonstrating the links between the SDH and health inequalities; how strong public service systems contribute positively to universal access to health care and education; how participation of civil society in local and national planning,

budget and implementation processes contribute to improved service delivery; and how monitoring and evaluation of key SDH indicators enhance accountability to users and communities.

Finally, a more critical SDH discourse that interrogates and addresses the structural determinants of health inequities as well as the unequal power relationships that exacerbate such inequities is needed.

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Violence, Alcohol Misuse and Mental Health: Gaps in the health system's response

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Violence, alcohol misuse and mental disorders are inextricably linked and are leading contributors to the burden of disease in South Africa, each in their own right but particularly where they overlap to produce a perpetuating cycle of harmful outcomes. South African homicide rates are estimated at more than eight times the global average among males and five times the global average among females. Similarly, South African drinkers rank in the top five riskiest drinkers in the world, with approximately 33% to 40% of drinkers consuming alcohol at risky levels. The South African Stress and Health Survey estimates the lifetime prevalence of mental illness amongst adults to be at 30.3%. This chapter outlines the evidence linking alcohol misuse, mental illness and violence. Access to mental health and substance misuse services in South Africa is low, with evidence suggesting extremely poor rates of detection and a major gap between demand for and supply of treatment services, particularly for substance misuse. Surveillance data, which is necessary to inform and monitor outcomes of relevant evidence-based policies and interventions, is sorely lacking for mental illness and substance abuse. In terms of violence, only mortality data are available, which will likely underestimate violence against women and also carry a significant time lag. Owing to the intersectoral nature of many of the risk factors for violence, alcohol abuse and common mental disorders, many of the related policies, legislation and interventions rely on government departments other than health. This gives rise to numerous opportunities but also to many challenges, which impact on policy development and service delivery.

Access to mental health and substance misuse services in South Africa is low, with evidence suggesting extremely poor rates of detection and a major gap between demand for and supply of treatment services.

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Introduction

Violence, alcohol misuse and mental disorders are inextricably linked and pose a major public health challenge in South Africa (SA), each in their own right but particularly where they overlap to produce a perpetuating cycle of harmful outcomes. These outcomes not only affect health but also create a wide range of socio-economic ills.

Interpersonal violence was ranked second among the leading causes of death and disability in SA in 2000 and accounted for 6.5% of all disability adjusted life years (DALYs).¹ Age-standardised homicide rates, estimated by Norman et al. in 2007, placed SA among the most violent countries in the world, and the chances of dying violently in South Africa were some 30% higher than in the World Health Organization's (WHO) AFRO^a region,² where intentional deaths are more often the result of war and conflict than interpersonal violence.³ Globally, South African homicide rates were estimated at more than eight times the global average among males and five times the global average among females.² The excess burden of male mortality in SA was confirmed by data from the National Injury Mortality Surveillance System (NIMSS), which collects data on injury deaths mainly from urban mortuaries. The data showed that there are more than six male homicides for every female homicide.⁴

Violence is common within the domestic environment and in the community. A nationally representative sample of female homicides in 1999 revealed that approximately half of all women murdered were killed by an intimate partner. At 8.8 per 100 000 population the national intimate partner homicide rate was the highest recorded in the world.⁵ Domestic violence also has direct effects on children, with one local study suggesting a high proportion of cases in which young children were injured unintentionally during parental domestic violence.⁶ Homicide rates among children in SA aged 0 to 14 years were double the global average in 2000.²

Apart from being at risk of abuse or being the victims of violence in the home, South African children are frequently exposed to violence to others in the home and to high levels of community violence.⁷ For example, in the Lavender Hill and Steenberg areas in Cape Town, over 70% of a sample of primary school children reported having witnessed violence⁸ and another cross-sectional study in Gauteng revealed that more than 50% of children had experienced violence, either as victims or as perpetrators.⁹ A study of youth from Khayelitsha in Cape Town, of whom half were selected from a children's home and half from an informal settlement known for high levels of violence, recorded all of the 60 respondents as having witnessed community violence. Of these, 56% had been victims and 45% had witnessed at least one murder. The psychological impact of these experiences manifested in 22% of these children meeting the diagnosis for post-traumatic stress disorder (PTSD), 32% for dysthymia and 7% for major depression.¹⁰

Mental health disorders, both trauma- and non-trauma related, are also a leading contributor to SA's burden of disease, yet remain largely unseen, as these disorders are not generally reflected in mortality data but result in a major disease burden and load on health facilities. The South African Stress and Health Survey (SASH) conducted between 2002 and 2004 is a nationally representative

household survey, which estimates the prevalence of mental illness amongst adults. The results show a 30.3% lifetime prevalence of any psychiatric disorder.¹¹ Aside from these data, there is currently no other source of reliable data on the prevalence of mental disorders in SA.¹²

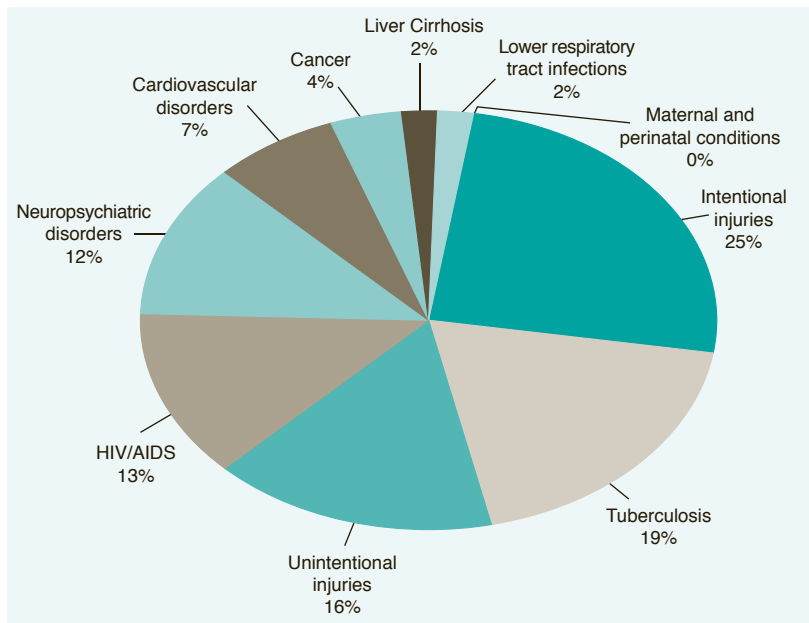
Mental illness results in significantly greater disability than most physical illness and as such accounts for a large proportion of the burden of disease. According to the WHO, 5 of the 10 leading causes of disability, moreover, are classifiable as psychiatric conditions (including depression and alcohol abuse).¹² In terms of future trends, global projections indicate that the situation will worsen, with depression predicted to be the second leading cause of disability worldwide in 2020.¹³ The impact of mental health will be grossly underestimated, however, if one excludes the role it plays in physical illness. Mental disorders are associated with substance abuse, smoking, and unsafe sex and, as such, mental illness results in a higher risk for injuries, cardiovascular disorders, and HIV.¹⁴

The mental health burden is compounded by the burgeoning abuse of substances, in particular alcohol, which is the most widespread drug of abuse in SA.¹⁵ Alcohol abuse is an important risk factor for violence and other mental health problems, as well as a large number of other health conditions. South African drinkers rank in the top five riskiest drinkers in the world, with approximately 33%¹⁶ to 40%¹⁷ of drinkers consuming alcohol at risky levels.⁵ Alcohol was found to be the third largest contributing risk factor to death and disability in SA, after unsafe sexual practices and interpersonal violence, both of which are strongly linked with alcohol abuse.¹⁸ Alcohol affects both the consumer and the non-consumer and, as such, SA is also a global leader in terms of alcohol-related harms, with eight times the global average for male homicides and twice the global average for road injury deaths.² Alcohol use also imposes sizeable economic costs, which have been estimated at approximately R220 billion per annum.¹⁹

Substantial data are available on the mechanisms through which alcohol abuse affects drinkers and non-drinkers. Recent analysis on the burden of alcohol-related harm found that intentional injuries (interpersonal violence and suicide) were the leading alcohol-related harm (25% of all harms) as shown in Figure 1. Infectious diseases also feature prominently, with tuberculosis (TB) (19%) and HIV and AIDS (13%) being the largest contributors to this domain. Non-communicable diseases accounted for the remaining alcohol-attributable DALYs, with neuropsychiatric disorders (alcohol use disorders, epilepsy and common mental illnesses) being the single largest component (12%).²⁰

a The WHO's African Regional Office (AFRO) represents countries in sub-Saharan Africa.

b Defined as having had at least 60 grams or more of pure alcohol on at least one occasion weekly.

Figure 1: Estimated alcohol-attributable DALYs, South Africa, 2004

Source: Obot, 2006.²¹

To reduce alcohol abuse and its harms significantly it is critical for anti-abuse projects to target the major harms caused by alcohol in SA, with prevention of violence, HIV and AIDS, TB, mental illness (including alcohol abuse itself) and road injuries – particularly pedestrian road injuries – taking priority.

Interrelationship between alcohol abuse, violence and mental ill-health

The interrelatedness of violence, mental health and alcohol use is well documented.

Alcohol misuse and mental health

Alcohol misuse affects mental health in two ways. First, alcohol- and other drug use affect mental health via the following biological mechanisms:

- The use of addictive substances may lead to dependence, and this in itself is a mental health outcome.²¹
- The drug has a direct action on the body – for instance, alcohol is a central nervous system depressant, which may contribute to the development of depression.²²

Secondly, alcohol misuse has a range of health, legal and social outcomes, including contributions to interpersonal violence, death and injury in road traffic accidents, increased levels of risky sexual behaviour, and relationship problems that may also negatively affect mental health.²¹ In addition, alcohol misuse may worsen the prognosis for existing mental health disorders.²³

Studies indicate a bi-directional association between substance misuse and mental illness. A large population-based study in Australia found that 0.5% of the Australian population had both PTSD and a substance use disorder; among those with PTSD, alcohol use disorders were most common (24.1%).²⁴ Large studies in the United States (US) population indicate that, with regard to

alcohol abuse (not dependence, which is a more severe problem), 12.3% of those who met criteria for alcohol abuse also met criteria for a mood disorder, and 29.1% for an anxiety disorder (of which PTSD was the most common).²² Percentages were much higher with regard to alcohol dependence: 29.2% had a comorbid^c mood disorder and 36.9% a comorbid anxiety disorder.²² Alcohol use disorders also often precede the onset of a depressive disorder, particularly in men.²² Substance use during pregnancy and during infancy is another risk factor for increasing the burden of disease, as prenatal substance exposure can lead to a range of mental health problems in the infant.²⁵

Similar relationships between alcohol and mental disease hold in the local context. The 2004 SASH study of 12-month and lifetime prevalence of mental health disorders found alcohol abuse to be the most prevalent individual lifetime disorder, affecting 11.4% of adult South Africans, with alcohol dependence affecting 2.6%. The comparative figures for other substances of abuse were 3.9% and 0.6% respectively.¹⁵ In a recent study of psychopathology and substance use among high school students in Cape Town, significant associations were found between alcohol use and both PTSD and depression.²⁶

The prominent contribution of alcohol to mental illness in SA is reflected in the disease burden, with estimated alcohol-attributable fractions for neuropsychiatric disorders ranging from 11%²⁰ to 44%.²⁷

Alcohol misuse as a risk factor for violence

With regard to violence, alcohol is an important situational risk factor that can precipitate violence and is associated with all forms of interpersonal violence, as well as suicide.²⁸ Three meta-analyses of the association between alcohol use and interpersonal violence described by Parry and Dewing in 2006 attribute between 27%

^c In other words, a mood disorder as well as the pre-existing alcohol dependence condition.

and 47% of intentional injuries directly to the use of alcohol.^{29,32} In SA, where per capita consumption among the drinking population is high and binge drinking is rife, particularly among the victims and perpetrators of violence, the contribution of alcohol may be even greater. The South Africa Demographic and Health Survey data suggest that alcohol use significantly increases the risk of being exposed to violence.³³ A study of patients presenting to trauma units in Cape Town, Durban and Port Elizabeth found that, on average, more than half of patients presenting for injuries caused by violence tested positive for alcohol use.³⁴ The same pattern presents among violence-related fatalities. According to a sentinel study of primarily urban mortuaries across SA, more than half of the victims of fatal violence were alcohol positive and 86 were males.⁴

As well as increasing vulnerability, alcohol has been shown to precipitate aggressive behaviour.³⁵ Several studies have found a link between alcohol dependence and child abuse,^{36,37} and excessive drinking by men is significantly associated with partner violence across different settings.³⁸ Women who live with heavy drinkers have a far greater risk of physical abuse from their partners.^{39,40} Although there continues to be some debate about whether there is direct causality between alcohol consumption and violence, evidence regarding this association is consistently found after taking into account other associated factors.⁴¹⁻⁴³ In reviewing this evidence, Rehm et al. in 2003 concluded that there is evidence of a causal link between alcohol consumption and interpersonal violence.⁴⁴ Some of the confusion may arise from the fact that alcohol has vastly different effects on individuals with different character traits. For example, people with high levels of trait aggression are exponentially more prone to violent behaviour after consuming alcohol than those with low trait aggression.^{45,46} In SA, a study of three provinces found that conflict over the male partner's drinking was also a risk factor for intimate partner violence, and more important than his drinking.⁴⁷ A 2006 study by Abrahams et al. also found that men who use violence against an intimate partner were more likely to report problematic alcohol use.⁴⁸ Reasons for why men who are drunk beat their partners are complex, and it has been suggested that some men use alcohol to gain the courage to beat their partners when inebriated, as this may be socially expected of them.⁴⁷ Alcohol is also implicated in the precipitation of and participation in violence and crime.⁴⁹

Violence as a risk factor for alcohol misuse and mental illness

A considerable body of global evidence associates experiences of violence or abuse with the development of mental health problems, and several studies from SA demonstrate similar findings.⁵⁰ Such violence might include partner violence, child abuse, or interpersonal violence more generally, and all are associated with disorders that include depression, suicidal tendencies, substance abuse, PTSD and other anxiety disorders.^{44,51-62}

Although causality is difficult to establish because of the ethical issues in conducting longitudinal studies and experimental studies (including randomised controlled trials) in this area, a consideration of the evidence using Bradford Hill criteria^d supports a causal relationship.^{51,63,64}

- Prevalence rates are higher among women experiencing domestic violence than among the general population (*biological gradient*).
- Exposure to violence and PTSD symptoms appear to follow a dose-response relationship; i.e. the greater the exposure, the more and/or the more severe the symptoms (*biological gradient*).
- Odds ratios calculated in studies where comparison groups are used are high, ranging from 3.55 to 3.80 in studies of depression, suicidality and PTSD, and from 5.56 to 5.62 in studies of substance misuse (*strength of association*).
- The magnitude of associations is consistently observed across different populations (*consistency and coherence*).
- Depression tends to remit once domestic violence ceases (*temporality*).

South African studies are mostly cross-sectional, but demonstrate both high rates of exposure to a range of violence and the same associated mental health problems as identified above in diverse population groups.⁶⁵⁻⁷⁸ Children's Court Inquiry data from the Western Cape suggest that in 2005 at least 9% of children in the Western Cape experienced severe maltreatment.⁷⁹ This can perpetuate a cycle of violence, alcohol abuse and mental health problems, as exposure to intimate partner violence as a child contributes to violent behaviour in adults.⁸⁰

A recent study in a Cape Town day hospital showed that 94% of participants had experienced at least one traumatic event in their lifetimes, and that 19.9% had current PTSD, with depression, panic-disorder and somatisation disorder with frequent co-morbidities. While many people are resilient in their exposure to traumatic incidents, such exposure can result in high rates of PTSD, depression, anxiety, substance misuse, and somatic symptoms.⁸¹ Although at present no studies exist within the healthcare services to suggest rates of PTSD among children, representative studies of children's exposure to violence in Cape Town suggest that children show similarly high rates of PTSD to those of adults.^{74,82}

Violence may also impact on common mental disorders, including substance misuse, through two other mechanisms: social disorganisation and fear of crime. High levels of crime and violence in a community are an indicator of social disorganisation, which refers to a disruption in the social structure of a community so that its ability to realise common values and exert social control over members is weakened.^{83,84} Most of the evidence in this area is from high-income countries and is based on cross-sectional studies, but it amounts to a weight of evidence which suggests that neighbourhood social disorganisation plays a role in parenting, mental health and violence. For instance, neighbourhood social cohesion (the opposite of social disorganisation) has been found to buffer the link between hostile parenting and children's externalising problems, including violence.⁸⁵ Mothers' perceptions of poor neighbourhood quality have been found to be related to children's social skills and often mediate through greater supervision and limitation of activities in worse neighbourhoods.⁸⁶ Mothers in unsafe neighbourhoods have also been found to be more likely to be depressed and to use inconsistent discipline.⁸⁷ Communities high in social disorganisation are also likely to be high in child maltreatment.^{88,89} Poverty is not the deciding factor: qualitative data from the US suggest that social

^d The Bradford Hill criteria are a set of nine factors that are used to provide evidence of causality. These are: strength of association; temporality; consistency; theoretical plausibility; coherence; specificity in the causes; dose response relationships; experimental evidence; and analogy.

disorganisation can be separated from poverty and that it is social disorganisation that affects parenting.⁹⁰

Very little evidence from SA is available in this area. However, a longitudinal study of a birth cohort of South African children in 1999 investigated the effects of both personal experience of violence and the experience of living with high levels of community violence. Maternal distress was associated both with family violence and with community danger, and distressed mothers were more likely to have distressed children. Ambient community violence was associated with children having attention problems, aggression and symptoms of anxiety and depression. Findings were similar regardless of economic advantage or disadvantage.⁶⁵

A body of evidence also exists for the association between fear of crime and the prevalence of common mental disorders⁹¹⁻⁹³ (positive association) and self-rated health⁹³ (negative association) but most of these data are taken from cross-sectional studies and, while confounders were adequately adjusted for, it is impossible to establish temporality. It seems reasonable to postulate a bidirectional association between mental illness and fear of crime.⁹² The effect of fear of crime on mental illness is thought to occur via two mechanisms: first, the negative impact on affect and, second, by creating "time-space inequality", which refers to a restriction of movement in terms of time (e.g. not going out after dark) and/or space (avoiding certain areas). This restriction limits social engagement, participation and access to social support.⁹²

Gaps in health services

Given the strong interdependence of mental illness, alcohol abuse and violence, provision of mental health services for children and adults is a critical part of primary-, secondary- and tertiary prevention of both alcohol misuse and violence. Access to mental health services in SA is low, with inpatient staff/bed ratios for SA's nine provinces ranging from 0.20 to 0.59, much lower than in high-income countries.⁹⁴ Rates of detection for mental health disorders are poor. For example, Carey et al. found that despite high rates of psychopathology detected by researchers, primary care clinicians had not identified any of the traumatic events or psychopathology present in an urban, Xhosa-speaking primary care population in Cape Town.⁹⁵ This is particularly concerning, as primary care is the most likely route patients will use to access the mental health system. Other problems in the health system include: a lack of implementation of policies and programmes for decentralisation and integration of services into general health systems; and the low priority given to mental health services with associated minimal resource allocation.⁹⁶

In terms of post-traumatic mental illnesses, interventions immediately after a traumatic experience can either prevent the development of later symptoms or prevent existing symptoms from becoming chronic.⁹⁷ Since many patients present to the healthcare system with physical injuries after experiencing a traumatic event, those involved in injury care (for instance, in emergency rooms and orthopaedic and plastic-surgery clinics) should be equipped to screen patients for post-traumatic mental health symptoms, and to make appropriate referrals as necessary.^{97,98} In addition, healthcare providers should be made aware that patients presenting with adverse mental health symptoms or unexplained physical symptoms may have experienced trauma.

The detection and appropriate management of substance abuse and dependence in general medical services also needs urgent review. International research indicates that between 50% and 90% of primary health care workers fail to recognise substance abuse in their outpatient population.⁹⁹ The availability of quick, highly sensitive and specific tools to detect substance abuse indicates that the problem lies with the training and supervision of healthcare workers.⁹⁹ The lack of addictionologists precludes ongoing training and assessment of service provision. Inadequate screening for substance abuse is also likely to be related to the lack of treatment services; overloaded health workers are unlikely to screen for a condition for which there is no available treatment.

In terms of access to treatment for substance abuse, including alcohol abuse, demand outweighs supply. Access is hampered by unequal geographical distribution and fragmented administration through both the welfare and health sectors, which have led to a lack of integration of mental health and substance abuse services. In particular, access to services by black South Africans is hampered by logistical, cultural and knowledge-related barriers.¹⁰⁰

In terms of a health response to violence, the Burden of Disease Reduction Project commissioned by the Provincial Government of the Western Cape in 2006, which included violence and injuries as well as mental health among the key focal areas for prevention, provides several useful precedents. There are also several opportunities within the current health service to support violence prevention; for example:

- integrating injury prevention activities into the health service, such as motivational interviewing for patients presenting with alcohol-related injuries; and
- improving referral to tertiary services that specialise in rehabilitative services.

The National Health Department is well positioned to support violence prevention undertaken by external agencies outside the health sector by providing outcome information to target prevention activities on groups at risk in high-risk areas and at high-risk times. Furthermore, an evidence-informed research approach has applicability and relevance for effective and cost-effective injury prevention. The Western Cape Provincial Transversal Management System has constituted several inter-departmental working groups, including an injury prevention working group, which has been tasked by the Provincial Cabinet to develop a provincial violence prevention policy to guide the development and implementation of evidence-informed and upstream prevention strategies.

Reviewing key Department of Health policy documents at a national level, such as the Human Resources for Health Strategy,¹⁰¹ the Primary Health Care Re-engineering Strategy¹⁰² and the National Health Insurance Green Paper,¹⁰³ it is clear that violence and mental illness, including alcohol, are recognised by the Department of Health as major contributors to the burden of disease. However, service strategies to address these burdens appear vague, and integration between alcohol abuse, trauma and mental health services is not apparent. Mental health is identified as an important area for investment in human resources^e and mention is also made of the provision of psychosocial support as part of the re-engineering of primary health care. Services to address alcohol abuse and services to address violence are only mentioned by name under school health services.

e Personal Communication: Crick Lund, November 2, 2012.

Available surveillance

Collecting surveillance data is a critical component in identifying and effectively managing any public health problem. First, the practice of monitoring provides useful data with which to influence policy development and helps to determine the outcomes, effectiveness and efficiency of intervention programmes. Without such data, decision makers do not have the information they need for policy design or resource allocation.¹⁰⁴ Second, a good monitoring system allows decision makers to determine whether a programme was actually implemented; whether it was implemented in the manner originally intended; and, if not, how this may have influenced effectiveness. Despite the massive burden of disease caused by alcohol abuse, violence, trauma and mental health problems, surveillance data on these critical public health concerns are sorely lacking.

In terms of alcohol abuse, population prevalence data are reliant on occasional cross-sectional studies, namely the Demographic and Health Surveys conducted in 1998 and 2003 and the single SASH study conducted between 2002 and 2004. Data on the prevalence of alcohol abuse among trauma ward clients or clients attending any level of state health facilities are also not routinely collected.

Morbidity data on adult and child mental disorders are similarly lacking. A review of available mental health data sources in the Western Cape in 2006, for example, found that health services do not collect routine data on common mental disorders or child and adolescent mental illnesses.¹² The only surveillance data available are suicide mortality rates collected by the National Injury Mortality Surveillance System (NIMSS). Suicide mortality is clearly a poor proxy measure for mental illness, as only a small fraction of those with mental health problems attempt suicide and an even smaller proportion complete suicide. Again, the single SASH study has provided the only measure of population prevalence of mental disorders and this study excluded people under the age of 18.

Data on violence are relatively more readily available, but remain largely confined to homicide data. The NIMSS and its provincial equivalents, the Provincial Mortality Surveillance systems (PIMSS), are currently the primary sources of data arising from the health sector that can be used for violence-prevention action and policy. However, homicide deaths are likely to represent only the tip of the iceberg of violence. Violence may not result in a physical injury at all and – even where it does – the injury may not result in death. As a proxy measure, it is also not clear whether the injury profile of non-fatal injuries is in any way similar to that of fatal injuries (indeed, a pilot study demonstrates that there are significant differences).¹⁰⁵ The use of the data for monitoring the need for and success of interventions is also limited by current delays in the availability of these data (the most recent report being from 2009), the lack of detailed information about injury location and the small number of cases. A major advantage of the data system is that blood alcohol levels are tested in a proportion of cases, which is helpful in providing data on alcohol-related homicide.

A commonly used alternative data source for violence is the crime statistics of the South African Police Service (SAPS). However, there are several significant drawbacks to these data: there is a significant time lag in the availability of data, which are only available annually as summary statistics. The crime categories do not correlate well

with definitions or categories of injuries or trauma, as they measure only alleged crime reported to the police and not actual crime. The measurement of actual crime is only possible after a lengthy judicial process. It is likely that a large proportion of violence is not reported (particularly rape and domestic violence) and a strong possibility of reporting bias exists (given that a reduction in rates of violence and/or traffic injuries is used as a measure of effective police performance).

Intersectoral confluences and conflicts

Owing to the intersectoral nature of many of the risk factors for violence, alcohol abuse and common mental disorders, many of the related policies, legislation and interventions rely on government departments other than health. This gives rise to opportunities but also to many challenges, which impact on policy development and on service delivery.

Despite the fact that alcohol disorders are internationally defined as psychiatric disorders and despite high levels of comorbidity of alcohol problems and mental illness, in SA these two overlapping areas are addressed by different government departments (the departments of social development and health respectively). The lack of integration of alcohol misuse- and mental health services results in a paucity of services that offer treatment for both substance and other mental disorders.¹⁰⁶ As such, the efficacy of treatment of both mental- and substance disorders is seriously compromised.

One example of an integrative approach at a national level was the establishment of an Inter-Ministerial Committee (IMC) on Combating Substance Abuse in 2010, which comprised the Departments of Social Development, Correctional Services, Health, Basic Education, Higher Education, Science and Technology, Economic Development, Transport, Trade and Industry and the SAPS.¹⁰⁷ One outcome has been the development of a substance abuse health sector plan, which aims to institutionalise the screening and management of substance abuse at selected health programmes, including trauma units. The plan also aims to capacitate health workers to better detect and manage substance abuse.¹⁰⁸ The 2nd Biennial Anti-Substance Abuse Summit in 2011, which evolved from the IMC, specifies several relevant resolutions, such as:

- the harmonisation of all laws and policies to facilitate effective governance of alcohol, including production, sales, distribution, marketing, consumption and taxation and the implementation of a continuum of care; and
- a public health approach that provides for prevention, early detection, treatment, rehabilitation and after care services.

However, these are but two of the 34 resolutions that were adopted and only the first of these has progressed as a focal area for implementation in the Anti-Substance Abuse Programme of Action for 2011 to 2016.¹⁰⁷

In terms of mental health policy, the Minister of Health held a mental health summit in April 2012, attended by more than 400 mental health stakeholders from a range of sectors.^e A new mental health policy is currently being drafted and a national action plan for mental health has been developed. Reviewing the draft policy, it appears that early childhood development, maternal mental

health, adolescents and HIV clients are major focus groups for interventions.¹⁰⁸ By contrast, there is no specific mention of trauma or substance abuse settings as key focal areas for mental health promotion and prevention and, in general, budget commitments remain vague. The policy refers to the importance of intersectoral integration of services, but no details of the nature and focus of such integration are provided.

Although the Anti-Substance Abuse Programme of Action and the Mental Health Summit specify a broad range of departmental role players, it should be recognised that the structure of government encourages a silo-based- rather than an intersectoral approach.¹⁰⁹ The transversal approach as adopted in the Western Cape, for example, is laudable, but its viability remains to be seen. In terms of reducing alcohol abuse and alcohol-related harm, the evidence demonstrates very clearly that the most effective way to achieve this is to reduce access to alcohol, through, for example, limiting the trading hours and number of liquor outlets.¹¹⁰ In SA, the responsibility for developing this legislation has rested nationally with the Department of Trade and Industry (dti) and provincially with the provincial departments of economic development and tourism (DEDAT), which have economic development, rather than public health, as a primary goal. In developing liquor legislation, while the dti and DEDAT have consulted other departments, the final mandate and decision-making powers have rested outside of the social sector. In September 2011, the dti partnered with the liquor industry to host a workshop on educational/informational interventions (for example, road shows) targeted at adolescents, despite adolescents not being a major risk group and a limited evidence base for the proposed interventions. In the same year, several provincial DEDAT partnered with South African Breweries on their Responsible Trader Programme, which has been shown to increase alcohol sales, turnover and profit while evidence for a reduction in alcohol abuse remains absent.^{19,111} These examples highlight the conflicts of interest within government to reduce alcohol abuse and demonstrate how these conflicts impact on which interventions are funded and undertaken by government.

A silo-based approach similarly undermines violence prevention. The criminal justice sector is considered as the custodian of safety, whereas the international experience of successful intervention suggests that an intersectoral response that encompasses primary-, secondary- and tertiary prevention is preferable. The security focus is also evident through increased spending on private security systems and personnel and increased quotas of national and metropolitan police officers, which is out of kilter with where costs accrue. For example, Alda and Cuesta in 2010 provided a comprehensive estimate of the cost of crime in SA using accounting methodology, in which health costs alone accounted for one quarter of the aggregated cost of crime estimate of US\$ 22.1 billion in 2007, or 7.8% of Gross Domestic Product (GDP).¹¹² Yet the health service response too is reactive and largely confined to the treatment and immediate emergency response to violence. A more primary preventive approach would include addressing, for example, substance abuse and other mental health disorders.

Similarly, legislation about domestic violence that supports social services, such as the Domestic Violence Act (Act 116 of 1998) and the Children's Amendment Act (Act 30884 of 2007), focuses predominantly on the tertiary response and rehabilitative needs of survivors. Across all sectors negligible investment is made in primary

prevention to address the upstream antecedents of violence, such as public infrastructure, access to services, and unemployment.

Conclusions and recommendations

Several key conclusions can be drawn from the preceding situational analysis relating to health systems, health services and surveillance. It should also be recognised that while the recommendations made here may be adopted as stand-alone interventions, every effort should be made to adopt an integrated approach in high-risk areas. Since the most vulnerable groups are those that experience multiple dimensions of poverty or deprivation, multifaceted interventions are likely to be the most effective.

Health services

The health service gaps identified relate primarily to a lack of recognition and prioritisation of the multi-directional links between violence, mental illness and alcohol misuse. Not recognising or prioritising these links results in a lack of data, policies and interventions that could address these problems in a sufficiently integrated manner. It also results in inadequate resource allocation. This gap is also evident at the clinical level, where mental illness, trauma or substance misuse is not adequately detected or managed. Clearly, it is important to train staff in services where they encounter trauma victims to screen for and provide management of substance misuse and mental illness. Detection and management of mental illness and substance misuse in other high-risk groups, including adolescents and perpetrators of violence, also need dramatic improvement.

An exhaustive review of evidence-informed interventions, which addressed these interlinked areas, was conducted for the Western Cape Burden of Disease project in 2007.¹¹³ The review highlighted some of the interventions necessary to achieve these goals. Health service recommendations included the recruitment and training of primary care workers and other health workers in screening and brief interventions for substance abuse and dependence; and the integration of mental health services into general medical services (with adequate provision for human resources, training, facilities, protocols and information management). The review also recommended expanding the budgetary allocation and provision of mental health and substance abuse services across all levels of care. Regarding staff, the review recommended appointing relevant specialists and sub-specialists (addictionologists, public health specialists, trauma specialists); providing dedicated mental health professionals and resources to maternal and trauma services; and increasing the number of trauma-competent mental health staff in general health services. Improving the staff competency and providing more focused services would involve training mental health professionals in substance misuse; introducing trauma-focused psychotherapy and pharmacotherapy; and developing postgraduate training programmes in trauma and substance misuse.

The review also identified important interventions that extend beyond health services. These included multifaceted community development interventions, the development of adequate referral networks for traumatised people across sectors, and evaluation of and support for non-governmental organisations currently filling the gaps in services, e.g. Child Welfare, Rape Crisis, FAMSA, and Lifeline.

Surveillance

The institutionalisation of injury mortality surveillance within the health service, as undertaken in the Western Cape, is an important first step to ensure an informed prevention response to both violence and mental health.¹¹⁴ However, the lack of detailed information about injury locations and the relatively few recorded deaths limit the utility to prioritising and monitoring interventions at a neighbourhood level. Further consideration needs to be given to how these data can be integrated with data from secondary and tertiary facilities and with data from emergency medical services. Where possible, mortality surveillance should be supported by cross-sectional studies of non-fatal cases, or at least sentinel surveillance in high-risk areas. In addition, given that most trauma patients may be under the influence of alcohol, it would be worth investing in rapid alcohol tests, such as breathalysers, so that emergency centres can facilitate the collection of data on alcohol-related trauma and to provide appropriate referral or rehabilitation.^{34,105} Similarly, including screening and detection of mental illness in this client base would provide at least some data on mental health morbidity in this high-risk group and facilitate access to mental health services for these clients.

Sentinel site surveillance should be considered as a means of obtaining regular data on the prevalence of common mental health disorders, including substance misuse disorders and child and adolescent mental health problems, particularly in high-risk settings and geographical areas. High-risk settings could include health settings (such as HIV, TB, family planning, maternal and chronic disease settings), and those falling under other sectors, such as police stations, courts and social services.

Ideally, at least some of the surveillance data should include data on violence and mental health problems, including substance use disorders, collected from the same cohort. In this way, common risk factors and groups at risk for multiple health outcomes can be easily identified and the impact of integrated interventions measured.

Building an effective intersectoral response

This chapter calls for the improved integration of mental health-, trauma- and substance abuse- services both within the health sector and among other relevant sectors. The establishment of an interministerial committee, much like the one that was convened to address substance abuse specifically, might also provide a platform for these three public health priorities to be addressed simultaneously. Creating an effective mechanism and avoiding devolution into departmental silos will require high-level oversight and accountability. The tensions that may manifest between the social and economic clusters, such as have been evident in the regulation of liquor, suggest that this oversight would preferably be accorded to Cabinet. Similar oversight is required to facilitate primary prevention and to address the numerous upstream factors that have an impact on a wide range of health conditions and the social circumstances that undermine health and wellness more generally.

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Chronic Non-communicable Diseases in South Africa: Progress and challenges

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In recent years, recognition of the rising threat of chronic non-communicable diseases (NCDs) as major contributors to preventable disease and premature mortality has placed these conditions firmly on the global development agenda. A United Nations resolution taken on 13 May 2010 set in motion processes that culminated in a United Nations Security Council summit on NCDs in September 2011. This action has been important in highlighting NCDs, especially in low- and middle income countries such as South Africa, and placing them on a par with other global health priorities such as HIV and AIDS.

In this chapter, we describe the current status of chronic NCDs in South Africa and point to the drivers of the high and increasing burden of NCDs in the country. Building on the review of NCDs in the 2008 South African Health Review, we reflect on progress in local policies and practices over the past five years.

Our review shows that increasing attention is currently being paid to NCDs in South Africa but that this heightened focus has to be strengthened and sustained over the next decades to combat the current trend and achieve a real reduction in the NCD-related burden. Specifically, more stringent measures are required to address the common risk factors of chronic NCDs and reverse the burden of NCDs. To achieve this, action is required from several constituencies. Ultimately, South Africa will need to invest in NCD prevention and control as an integral part of sustainable socio-economic development.

Increasing attention is currently being paid to NCDs in South Africa but this heightened focus has to be strengthened and sustained over the next decades to combat the current trend and achieve a real reduction in the NCD-related burden.

Introduction

“Chronic non-communicable diseases” (NCDs) refers to a group of slowly progressive medical conditions or diseases of long duration (chronic), which are characteristically non-infectious and non-transmissible among people (non-communicable). They include heart disease, stroke, cancers, diabetes, chronic obstructive pulmonary disease (COPD), asthma, cataracts, and more. The chronic character of these diseases demands long-term care and they impose a continuous burden on an already overstretched health system similar to the way HIV infection does. Their non-infectious cause however points to a different set of determinants that need to be targeted.

Chronic NCDs, which account for approximately two-thirds of all deaths globally, are the leading cause of mortality worldwide.¹⁻³ Cardiovascular disease, cancer, type II diabetes, and COPD make up the majority of the NCD-related burden. This burden is increasing in many countries that still suffer widespread infectious diseases, resulting in a double burden of disease.¹ For example, approximately 83% of the global mortality from NCDs occurs in low- and middle-income countries (LMICs). Furthermore, it is estimated that the total deaths globally attributable to NCDs will increase by 15% in the next decade.³

In South Africa (SA), NCDs account for an estimated 37% of all-cause mortality and 16% of disability-adjusted life years.⁴ Ischaemic heart disease, stroke, diabetes mellitus, and COPD account for 6.6%, 6.5%, 2.6%, and 2.5% of all deaths respectively. This burden varies significantly between population groups. For example, the age standardised cardiovascular disease mortality rate is 606.9 per 100 000 for Asians and 375.3 for ‘Africans’.⁴

Evidence exists of a growing interest in tackling the burden of NCDs in SA. In September 2011, the South African government convened a summit on the “Prevention and Control of Non-Communicable Diseases”.⁵ The summit, which included various governmental departments, researchers, private sector stakeholders, and civil society, produced a declaration that endorsed action aimed at various levels of risk factors (behavioural, environmental, and structural). It also acknowledged the need for intersectoral collaboration.⁵ Furthermore, the national government will soon be releasing a “Strategic Plan for Non-Communicable Diseases, 2012-2016”, which will provide a short-term framework to reduce the burden of NCDs.

The recent acknowledgement given to NCDs in SA is important progress. Aside from the tremendous burden NCDs place on individuals, they also pose significant economic challenges to the country. NCDs can deepen poverty, reduce economic productivity, and strain an already under-resourced healthcare system. Action is urgently required: as a result of the demographic transition, NCD rates will increase regardless of progress made in reducing the prevalence of leading risk factors. For example, it is estimated that between 2001 and 2025 the proportion of the population aged 60 and older will increase from approximately 7.1% to 10%.⁶

However, there is reason for optimism. Many of the risk factors for NCDs are modifiable, which provides considerable opportunities for intervention. However, progress in reducing these risk factors will only be attained if appropriate attention is given to their social and structural determinants. A concerted effort from all government

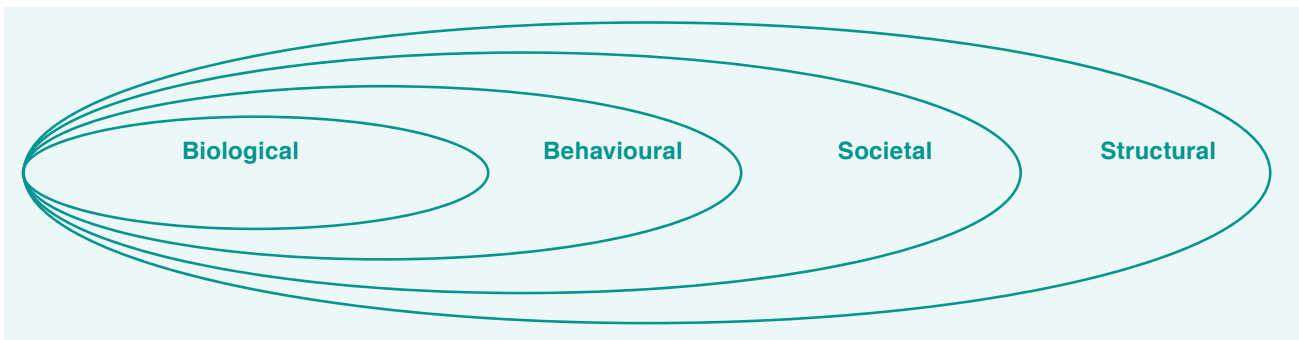
departments and sectors in society is required to mitigate the future threat that NCDs pose to the country.

In this chapter, we describe the current status of chronic NCDs in South Africa and point to the drivers of the high and increasing burden of NCDs. Building on the review of NCDs in the 2008 *South African Health Review*² we reflect on progress in policies and practices in the past five years. We deliberately focus on the ‘big four’ (heart disease, cancer, type II diabetes and COPD) because of the overall burden they make up in SA and the many risk factors they commonly share. Mental illness, a major contributor to the overall disease burden in SA,⁷ is not covered in this chapter. We then provide examples of interventions that have been implemented in SA and other countries. Finally, we conclude by highlighting the current challenges facing public health research in SA and offer a future direction for alleviating the NCD-related burden.

Risk factors for NCDs

Many factors increase an individual’s risk for NCDs. It is useful to visualise the various categories of risk factors or determinants as depicted in Figure 1 which highlights two main points: the relative distance of each group of risk factors to the disease outcome (i.e. “biological” – proximal; “structural” – distal), and the influence each group of risk factors has on another group (emphasised in Figure 1).

It is also useful to divide the risk factors into factors that are modifiable and non-modifiable. Modifiable risk factors are the behavioural, social, and structural determinants, in which it is feasible to intervene. Non-modifiable factors consist of an individual’s characteristics such as age, gender and genetic endowment. Success in reducing the prevalence and burden of NCDs in SA will rely on a comprehensive strategy that focuses on all modifiable determinants while recognising the role of individual and biological factors. Below we briefly review key risk factors and determinants, beginning with the more proximal and concluding with the distal, structural determinants.

Figure 1: Determinants of health portrayed as concentric rings of risk factors

Source: Western Cape Burden of Disease Reduction Project, 2007.⁸

Individual determinants

Most NCDs are related to behavioural or 'lifestyle' factors, which in turn are significantly shaped by factors embedded in the social (working and living) environment and structured by more distal economic and political factors. However, certain populations have a heightened genetic susceptibility, which not only increases the likelihood of developing NCDs but also influences the age of onset. One of the most prominent evolutionary theories linking genetic endowment with NCDs is the 'thrifty gene' hypothesis, which explains why some populations are more susceptible to type II diabetes than others. Essentially, 'thrifty genes' increase fat storage during times of abundance to compensate for infrequent bouts of famine.⁹ This was an important evolutionary trait that increased survival in times when food supply was especially precarious.

In SA, some ethnic groups have been shown to have an increased risk for certain NCDs. For example, South African Indians are more susceptible to insulin resistance than other ethnic groups in the country, which has resulted in an increased risk for type II diabetes among this group.¹⁰ Also, approximately 1 in every 72 Afrikaners has familial hypercholesterolaemia, an autosomal dominant genetic disorder, which results in elevated low-density lipoprotein levels and an increased risk for ischaemic heart disease.¹¹ Fortunately, genetic testing and counselling programmes have contributed significantly to the identification, prevention, and management of the disease for those at greater risk of developing these disorders as a result of their genetic endowment.

It is increasingly recognised that exposure to unhealthy risk factors such as inadequate nutrition and smoking during 'critical periods' of life such as pregnancy, foetal life and early childhood can increase one's susceptibility to an array of chronic diseases later in life.^{12,13} There is evidence that this is a concern in SA. For example, using data from the baseline birth-to-ten study cohort, Steyn and colleagues showed that in 1990 in the greater Johannesburg area, approximately 6% of pregnant women were current smokers and that a significant association was found between smoking and low birth weight.¹⁴

Behavioural determinants

Most NCDs (heart disease, type II diabetes, and certain cancers) are associated with behavioural risk factors such as tobacco use, physical inactivity, unhealthy diets and alcohol abuse. These risk factors cluster in groups of individuals as a result of their socio-

economic status (SES) and environment, and contribute to the disparity in health outcomes between groups.

Tobacco use

According to the World Health Organization (WHO), "tobacco is the single most preventable cause of death in the world today".¹⁵ Approximately five million people in the world die each year as a result of tobacco use. Tobacco use has been causally associated with numerous NCDs such as ischaemic heart disease, COPD and a wide variety of cancers. Although great success has been achieved in many developed nations in reducing the prevalence of smoking, the burden is shifting to many LMICs, largely as a result of an aggressive business strategy by the tobacco industry.¹⁶

In SA, the prevalence of smoking is relatively high. The most recent national survey indicates that in 2003, 35% of adult men and 10% of adult women were considered to be daily or occasional smokers.¹⁷ The high prevalence of smoking in SA is also reflected in cancer rates. For example, lung cancer is the leading cause of death from cancer in men.¹⁸ Although SA has developed and implemented a comprehensive tobacco control policy, 2008 data suggest that virtually no progress has been made in decreasing the prevalence of smoking in SA youth over the past decade.¹⁹ Approximately 21% of youth in grades 8 to 11 are current smokers, measured by self-reported tobacco use in the past 30 days.¹⁹ Lack of progress on this front should be of concern for public health advocates in SA, given the well-established relationship between the age of onset of smoking and the likelihood of lifetime use.

Obesity

SA is currently experiencing an obesity epidemic. Obesity is associated with many chronic diseases, including type II diabetes, heart disease, certain cancers, and osteoarthritis. So strong is the link between obesity and type II diabetes that the term 'diabesity' has been coined to describe their dualistic occurrence in the population.²⁰ A survey conducted in July 2010 among 500 adults in the country's four biggest cities, on behalf of the pharmaceutical company GlaxoSmithKline (GSK), found that 72% of the residents of Cape Town, 68% of residents of Pretoria, 59% of those of Johannesburg, and 52% of those of Durban are overweight.²¹ In 2000, it was estimated that 87% of cases of type II diabetes and 7% of all deaths were attributable to excess body weight.²²

According to national data obtained from the South Africa Demographic Health Survey (SADHS) of 2003, approximately 55% of women and 30% of men are considered overweight or obese.¹⁷ Disturbingly, youth appear to be following a similar pattern. For example, according to the South African Youth Risk Behaviour Survey of 2008, approximately 17% to 20% of youth aged 13 to 19 are overweight and 4% to 5% are considered obese.¹⁹

The continuing rise in prevalence of overweight and obesity in most 'developed' countries and in an increasing number of LMICs has been associated with a dramatic transition from diets constituted by 'whole' foods to diets increasingly composed of processed foods. Specific dietary components are associated with chronic diseases; for example, diets with high levels of saturated fat, salt, and refined carbohydrates are associated with cardiovascular disease and type II diabetes.²³

In SA, limited data are available on individual or household dietary consumption patterns. Much of our knowledge of dietary patterns is derived from commercial sales statistics, a nationally representative survey of food consumption for children (one to nine years old), and small-scale dietary intake studies in various sub-populations throughout the country. These studies highlight the similarities and differences in diets according to SES, socio-demographic factors, and geography.²³ For example, a 2011 study that investigated the prevalence of street food- and fast food consumption indicates that 19% of black Africans were considered frequent (≥ 2 a week) street food consumers in comparison to Indians (1.9%) and Whites (2.9%).²⁴ Interestingly, when measuring fast food consumption, the rates were reversed: 14% of Indians, 12.5% of Whites, and 5.4% of Blacks were considered frequent consumers. Contrary to most developed nations, fast food consumption from large commercial outlets in SA is highest in high socio-economic groups.²⁵

It is increasingly evident that an emerging trend of unhealthy 'western' eating is occurring in SA. A review undertaken in 2012 suggests that sugar consumption in SA is increasing.²⁶ This is especially the case in regard to soft drink consumption. For example, from 1992 to 2010, per capita – per year consumption of Coca Cola products rose from 130 to 254 units.²⁷ Furthermore, between 2005 and 2010 ready meals and snack bar sales increased by 43.1% and 42.6% respectively.²⁷ Traditional diets, high in legumes and low in processed/refined carbohydrates, are being replaced by a 'western' diet that is implicated in NCDs.²⁸ Although a noticeable difference in the dietary composition among South Africans still exists, the increasing changes to the food environment (discussed later) suggest that it is quite plausible that the 'western' unhealthy diet will one day be pervasive across the country.

Physical inactivity

Physical inactivity or sedentary lifestyles in general can be seen as a defining characteristic of modern life, especially in urban regions. Technological advancements, urbanisation, and infrastructural changes are some of the factors associated with sedentary lifestyles. This is of concern because physical inactivity is a risk factor for many NCDs. Aside from being a key determinant of body weight, physical activity is independently associated with a reduction in heart disease, type II diabetes, hypertension, and cancers of the breast and colon.²⁹

In SA, an unfavourable trend of inactivity among youth appears to

be developing. The 2008 National Youth Risk Behaviour Survey indicates that an increasing number of youth (42% from 38% in 2002) neither participate in any activity nor perform a sufficient amount of exercise on a weekly basis.¹⁹

Alcohol misuse

Alcohol, when consumed in excess quantities, is associated with a wide range of social and biological maladies.³⁰ In SA approximately 12% of adolescents initiate alcohol use before they are 13 years old.³¹ Consumption patterns for adolescents (aged 13 to 19) between 1998 and 2008 largely remained the same. Although significant differences in alcohol consumption patterns between genders still exist, binge drinking among female adolescents, which was historically low, appears to be increasing.³¹

Social determinants

Social determinants generally refers to the conditions in which people live, work, and grow. The social determinants of health provide insight into how factors such as one's employment, educational attainment, living accommodation, and ability to participate in society fully can affect the equitable distribution of health.

Employment, poverty and education

Poverty is the most obvious and significant determinant of poor health outcomes, which include many NCDs. Statistics South Africa data from 2012 Quarter 3 (the most recent data available at the time of writing) indicate that the unemployment rate is at a staggering 25%.³² Youth (15 to 24) are disproportionately affected, with an unemployment rate of 31.4%. Nationally, 22.3% of households receive their main source of income from grants.³³ Provincial variation highlights the challenge of poverty. For example, 37.9% of the Eastern Cape population relies on grants for its main source of income, whereas this applies to only 10% of the Gauteng population.

The percentage of individuals aged 20 and older who had completed their Grade 12 increased from 21.5% in 2002 to 27.4% in 2011. Also, the percentage of people with no formal education decreased from 10.8% in 2002 to 6.5% in 2011.³²

SA has a long history of occupational hazards, most notably in the mining sector.³⁴ These hazards, which workers – often migrant labourers – have been exposed to for a long time, are strongly associated with COPD and other chronic diseases, and include tuberculosis.³⁵

Accommodation

An important way of measuring standard of living is through the quality of accommodation. In SA, approximately 12.1% of the population resides in informal settlements.³³ This section of the population is particularly concentrated in the Gauteng (20.4%), North West (18.4%), and the Western Cape (15.1%) provinces. Progress is being made in regard to living conditions. For example, the percentage of the population that received a government housing subsidy increased from 5.5% in 2002 to 9.5% in 2011. During the same period, the proportion of households connected to the main electricity supply increased from 76.8% to 82.7%.³³

Families that cook and heat their homes with biomass fuels such as wood substantially increase their risk of developing COPD and other conditions associated with indoor air pollutants.³⁶ In SA, progress is slowly being made in eliminating this risk. For example, between 2002 and 2011 the proportion of households that used wood as a primary source of energy decreased from 19.7% to 13.3%.³³ Moreover, the percentage of households that used electricity for cooking increased from 57.9% to 73.1% during the same period. The variation between provinces is significant. For example, in Limpopo approximately 44.5% of households cook with wood, whereas in Gauteng only 1.2% do so.³³

Socio-economic status and behavioural risk factors

The relationship between SES and behavioural risk factors for NCDs in SA is beginning to follow a pattern that is commonly found in developed countries. For example, smoking and educational attainment (proxy for SES) are inversely related in SA.¹⁷ The 2003 SADHS¹⁷ showed that men who had only completed schooling up to grades 6 and 7 had a 35.4% prevalence of smoking. In comparison, men with an education level of higher than Grade 12 had a 22.3% prevalence of smoking.¹⁷ However, the evidence is not nearly as clear for risk factors such as obesity and hypertension.³⁷ For example, a 2005 study in Limpopo, one of the poorest provinces in SA, reported that 51.7% of rural women are overweight or obese, which illustrates that risk factors for NCDs are not only present among the affluent.³⁸ This observed phenomenon is perpetuated by the increasing penetration into poor communities of cheap processed and packaged food; the pattern of high obesity rates shifting from the affluent to the poor, which is commonly seen in the developed world, is likely to be occurring in SA already.

Structural and environmental determinants

The rise of NCDs in LMICs should be seen as a symptom of a larger transformative force. Globalisation has been increasingly altering the social, political, economic and environmental landscape over the past few decades. An important and fundamental feature of globalisation has been a dramatic increase in international trade and foreign direct investment, driven largely by multi-national corporations' need to seek new markets to increase profits. In the following section, we use the food environment as a prime example of this transformative force.

Food environment

Food systems (production, manufacturing, and distribution) have undergone significant changes in the last few decades. These changes have resulted in a 'nutrition transition' in many LMICs as dietary consumption patterns have become more 'westernised'.³⁹ As a result of the growth of multi-national food corporations, the liberalisation of international food trade and investment, and an increase in the marketing of unhealthy food products, traditional diets, which were largely prepared from raw ingredients, are often being substituted by ready-made and energy-dense meals along with energy-dense and nutrient-deficient snacks.⁴⁰ Much of this ready-made food is increasingly processed and linked to chronic diseases.⁴¹

In SA, this 'transition' has dramatically accelerated since the mid-90s when the post-apartheid government, under immense international pressure, opened the borders to an influx of trade and foreign direct investment. Since then, 'Big Food' (large commercial entities that dominate the food and beverage environment) has dominated the food supply by making its products more available and affordable. This has facilitated a shift in normative food culture, resulting in these products also becoming more acceptable.²⁷ The increasing market share captured by large supermarket retailers and fast food outlets in urban and rural areas has catalysed a shift in dietary patterns. Many rural populations are purchasing the majority of their food in large supermarket chains that are heavily stocked with processed foods.⁴² Dietary diversity (the increasing quantity of available food options) is critical in preventing undernutrition and overnutrition; yet such healthier options are usually higher priced (especially when the costs of energy for cooking are included) and as a result out of reach for many South African families. For example, a study published in 2010 on the availability and price of healthy food options in rural Western Cape showed that for a family of five to purchase the healthier equivalents of their usual food items (e.g. whole wheat rather than white bread) would require an additional R1 090/month.⁴³

Marketing of unhealthy products and behaviours

The diffusion of unhealthy products and behaviours could not have happened to the extent that it has, or certainly not as quickly, without the vigorous marketing efforts of many industries.

In SA, some progress has been made in limiting these marketing methods. In 1999, an amendment was made to the Tobacco Products Control Act, which prohibited the advertising and promotion of tobacco products.⁴⁴ In 2007, an additional amendment was made to clarify various definitions, among other things, and close existing loopholes. These are important steps in cleansing the environment of posters, statements, and promotions that present tobacco products in a positive light.

Controlling the tobacco industry is supported by strong scientific evidence and political feasibility in several jurisdictions. This is not necessarily the case for other unhealthy products such as alcohol and food, for which there has been less success in regulation. For example, around R2 billion is spent annually in SA on marketing alcoholic beverages.⁴⁵ Children are also bombarded with images that support unhealthy food options and diets. For example, a study undertaken in 2006 examined the content of commercial food advertisements during children's television programming and found that over half of the food advertisements were for products that were of poor nutritional quality.⁴⁶

Cultural determinants

Many traditional and cultural factors contribute to the increase in NCDs in SA. Various factors are altering the way of life for many South Africans. Arguably, no greater force exists than the increasing role that corporations play in 'manufacturing lifestyles' by affecting an individual's tastes, desires, preferences, and activities.⁴⁷ A disturbing trend that is contributing to a sedentary lifestyle for South African youth is the rise in television viewing. In 2008, 29% of South African youth reported viewing more than three hours of television

a day, in comparison to 25% in 2002.¹⁷ Another cultural factor that is contributing to the increasing risk of NCDs is the perception that many black women in SA hold, which is that being overweight is considered attractive, appropriate, and a sign of affluence and success.⁴⁸ These beliefs appear to be prevalent in adolescents and are likely to be a strong factor in preventing many females from addressing their weight.⁴⁹

Interventions to address chronic NCDs

Responding to chronic NCDs and their risk factors, a menu of interventions and strategies exists in SA. In line with the determinants of chronic NCDs, as outlined in Figure 1, interventions addressing NCDs can be grouped as those addressing the health service management of chronic NCDs which respond to biological risks including ensuring secondary prevention once disease is present; community-based responses, which respond to behavioural and societal risks; and broader policy or structural interventions. These interventions are described in more detail below.

Health service management of chronic NCDs

Health management of chronic NCDs comprises a package of care whose primary aim is to improve the health outcomes of the individual. Interventions that focus on individuals are as important as the population-based approaches to NCDs in the management and control of these conditions. This means that it is important to complement population-wide approaches with healthcare interventions for individuals who already have NCDs or who are at high risk of developing them.^{50,51} In SA people with chronic NCDs have access to health services through the private and public sectors. However, the health services have done little to identify those at risk and intervene. The focus has been primarily on management and the control and prevention of complications among individuals who are already diseased. A 2008 publication by Steyn and colleagues reported suboptimal primary care for patients with hypertension at public sector community health centres.⁵² The study was, however, based on a primary care audit conducted in the Western Cape Province that took place in 1999.⁵² There is a dearth of similar systematic audits, thus making it difficult to assess the current status of primary care management in public sector facilities. The government has adopted the primary health care (PHC) re-engineering strategy as a means of strengthening the effectiveness of the current health system. This approach, which is being piloted in several districts, has great potential to address NCDs comprehensively as it will focus on health promotion, disease prevention and referral for curative care to improve health outcomes.⁵³ Furthermore, this approach will build the capacity of community health workers in the management of chronic conditions.

To strengthen the management of chronic diseases further the Practical Approach to Lung Health and HIV/AIDS (PALSA PLUS) programme has been expanded to address 40 common presenting symptoms and 20 chronic conditions.⁵⁴ This is a standardised symptom-based approach to routine care of chronic disease and has been piloted in certain provinces in SA. It has improved the cost effectiveness of care for patients with chronic diseases, such as diabetes, hypertension, and chronic respiratory diseases, and the detection of depression.⁵⁴

Community-based interventions

Community prevention programmes are important in influencing behaviours and health beliefs and for this reason such initiatives can be empowering to communities. The initiatives that are listed in Table 1 include programmes provided by a private medical aid company, government and research institutions. The interventions mentioned focus on one or two risk factors only; this shows that there is a lack of intervention programmes that encompass several risk factors.

Policy responses

Food-related policies

According to Charlton et al., in 2007 salt intake among South Africans exceeded the international guidelines of <6 g salt/day and the greatest contributing source of salt was bread.⁶³ In response the government has drafted Regulations in the Foodstuffs, Cosmetics and Disinfectants Act (Act 54 of 1972), published in the Government Gazette (11 July 2012) to reduce the salt intake in processed foods.⁶⁴ The process of reducing salt will occur in phases and food manufacturers will have until June 2016 to comply with the first set of sodium targets and another two years to reach the next targets.

Trans fatty acids have been found to increase the risk of cardiovascular diseases and, according to the WHO, the recommended amount of energy that can be derived from trans fatty acids should not exceed 1% of the daily energy consumption. In order to prevent the problems caused by trans fatty acids, Regulations relating to trans fat in foodstuffs were passed in the Foodstuffs, Cosmetics and Disinfectants Act, 1972 in 2011.⁶⁵ Under these Regulations, the sale, manufacturing and importation of any processed foods that exceed 2 g per 100 g of partially hydrogenated fats and oils are prohibited. However, these Regulations are not specific about the labelling of naturally produced trans fatty acids and, therefore, companies such as those in the dairy industry will not be affected by the Regulations. This means that the content of fatty acids in products may exceed 2 g per 100 g if the trans fatty acids in these products are not industrially produced.

New food labelling and advertising legislation came into being in March 2012. This legislation will ensure that food labels and advertising conform to a standard format. Furthermore, according to the amended Regulations, any claims used on food labels and in advertising will be removed. This will ensure that consumers are not misled by false health claims.

Tobacco control

Tobacco control is said to be one of the most effective programmes for the prevention of cardiovascular disease in the world.⁶⁶ SA has implemented progressive policies for tobacco control. Since 2008, several amendments have been made to the Tobacco Act 1993. In March 2012, a Regulation in the Tobacco Products Control Act, (Act 83 of 1993) was passed to prohibit smoking in public places and certain outdoor public places. The Regulation is aimed at protecting the public from the dangers of passive smoking.⁶⁷

Table 1: Examples of initiatives and programmes targeting chronic NCDs in South Africa

Programme	Programme Description	Programme Outcome
Discovery Vitality ^{55,56}	<ul style="list-style-type: none"> Created by Discovery Insurance, this programme encourages members to lead healthier lifestyles by providing incentives, with the goal of lowering future healthcare costs Participants assess their health status, then participate in activities intended to improve their health (e.g. joining a gym, buying nutritious food) Completing an activity rewards the member with points, which accumulate to achieve blue, bronze, silver, or gold status Higher status allows the member to access higher levels of travel, leisure, and shopping discounts 	<ul style="list-style-type: none"> As of 2006, the programme had 591 134 members Members with higher point statuses were found to have lower costs per patient, shorter stays in hospital, and fewer admissions compared with those less engaged Admission rates were 7.4% lower for cardiovascular disease, 13.2% lower for cancers, and 20.7% lower for endocrine and metabolic diseases in the highly engaged group compared with those less engaged
HealthKick ^{57,58}	<ul style="list-style-type: none"> Commenced in 2007 as an intervention among school-aged children to promote healthier diets and more physical activity Took place in 16 low-income disadvantaged urban and rural schools in the Western Cape Eight intervention schools were provided with an action planning process, and provided with a toolkit containing lesson plans, informational resources, and physical activity equipment to carry out the programme The control schools were given printed resources, but no help in implementing the programme 	<ul style="list-style-type: none"> Outcome and process evaluations are ongoing
Moving Matters ⁵⁹⁻⁶¹	<ul style="list-style-type: none"> A programme for school children in grades 4 to 7 intended to improve the motor skills necessary for them to participate in physical activities successfully Focuses on balance, manipulation, and locomotion Teachers are provided with a manual of lesson plans, and learners are provided with an activity manual and equipment bag 	<ul style="list-style-type: none"> In 2011, 62 schools in Gauteng and the Eastern Cape participated
Siyadlala ⁶²	<ul style="list-style-type: none"> A programme created by Sports and Recreation South Africa intended to increase participation in organised sports in disadvantaged communities in order to increase health and mobilise the community Hub and activity coordinators are trained in sports coaching, first aid, project planning, and events management Participation is encouraged among youth, the elderly, women, and people with disabilities 	<ul style="list-style-type: none"> In the Western Cape, 35 hubs were established to target six regions Identifies young talent and offers them support for further development

Smoking rates have decreased in SA; however, this may be unrelated to the country's tobacco control policies. Peer and colleagues observed in 2009 that the decrease in smoking had been higher among the poor and this may be attributed to the increase in tax imposed on tobacco products.⁶⁸ A positive outcome of the decline in smoking rates has been its consistency with the stabilisation in the number of smoking-related cardiovascular deaths.⁶⁹

Recently the National Department of Health (NDoH) has made further amendments to the Tobacco Act (August 2012) by passing a draft Regulation that relates to the display of tobacco products at wholesale and retail outlets. Studies have shown that tobacco displays at retail stores are an important form of advertising and promoting tobacco products and such advertising has been linked to increased tobacco sales and use.⁷⁰ Such legislation may assist in decreasing sales by making smoking less enticing.

Alcohol control

NCDs such as cancer, cardiovascular disease, liver disease, pancreatitis and diabetes have been linked to alcohol consumption.⁷¹ Despite this link, alcohol control has had little effect on reducing the rates of alcohol misuse.⁷²

Studies in several countries have found that alcohol advertising has an influence on young people's behaviours.⁷³ Current national policies to reduce alcohol consumption in SA include restrictions on alcohol advertising and counter-advertising, regulation of retail alcohol sales, control of alcohol packaging, and increased alcohol taxation.³¹

Several new policies have been proposed at the national and provincial levels, but have not yet been implemented. Among these policies is a Bill that would ban all alcohol-related advertising in SA.⁷⁴ However, the Bill has been met by strong opposition from the Department of Trade and Industry because of its economic implications.

Several provinces such as the Western Cape have formulated their Liquor Act to include trading hours; however, days and hours in which liquor can be sold in these provinces will be determined by the municipalities. The proposed Gauteng Liquor Bill of 2011 intended to prohibit the sale of alcohol to pregnant women in an effort to reduce foetal alcohol syndrome.⁷⁵ The proposal drew criticism for limiting gender equity.

Proposed national policy and strategy for NCDs

Government has made progress in formulating and implementing population-wide interventions as highlighted in the section above. However, there are still a number of interventions that need to be focused on. Box 1 below outlines national policy and strategies that should be considered to address the main risk factors for NCDs.

Box 1: Population-wide interventions to promote healthy diet, physical activity, healthy environment and no smoking or harmful alcohol use

- ❖ Strengthen tobacco control, particularly among young people, and decrease passive smoke exposure of children in the home
- ❖ Support quitting-smoking programmes
- ❖ Promote healthy eating patterns that are low in fat and sugar and high in fruit and vegetables, in part by addressing access through intersectoral programmes that involve the agricultural sector
- ❖ Restrict access to alcohol (through addressing physical availability and pricing) and extend alcohol control legislation (particularly in the areas of alcohol marketing, and drinking and driving)
- ❖ Promote physical activity in schools and workplaces, and through urban planning for active commuting and access to safe public green space
- ❖ Reduce exposure to indoor biomass pollutants through electrification of households
- ❖ Control air pollution, including through reviewing and enforcing legislation related to polluted places of work
- ❖ Develop media and communication strategies to prevent NCDs
- ❖ Tax unhealthy foods and subsidise healthy foods
- ❖ Restrict import of processed foods

Source: Adapted from Bradshaw, Steyn, Levitt and Nojilana, 2011.⁷⁶

Challenges in research and surveillance for NCDs

Strategic planning and effective policy development to address NCDs require a functional information system to track NCDs and their risk factors. Programmes and activities in epidemiological surveillance and research form the basis of an information system that would enable the assessment and monitoring of disease trends. Where set appropriately, this system would not only allow the measurement of health status (i.e. mortality and morbidity related to NCDs) but also track the prevalence of NCD risk factors and would be able to measure behavioural and social determinants of health. Unfortunately, these information systems are limited in SA.

Funding opportunities for research related to chronic NCDs are scarce. This has resulted in a large proportion of studies being cross-sectional and descriptive in nature, and often sub-national in extent, which makes them of limited generalisability. National surveys such as the Demographic and Health Survey and the Youth Risk Behaviour Survey have not been conducted in the past five years. However, in 2011-2012 the Human Sciences Research

Council launched the South African National Health and Nutrition Examination Survey, which will provide comprehensive information on the health and nutritional status of males and females of all ages in support of the priority health indicators of the NDoH.⁷⁷

There are very few cohort studies in SA. Prospective cohort studies can provide valuable information on the association between the exposure to risk factors and health outcomes; they can help in calculating the incidence rate in both the exposed and non-exposed and can permit the assessment of multiple outcomes in the same study. Existing cohort studies include the "birth-to-twenty" cohort, which is a study of more than 3 200 children and their families in Soweto, Johannesburg.⁷⁸ SA is also part of the Prospective Urban Rural Epidemiology (PURE) study, which is a global adult cohort study of 17 countries and more than 150 000 participants.⁷⁹ Two PURE study sites have been set up in SA, with participants drawn from urban and rural communities in three provinces: North West, Eastern Cape and Western Cape. The PURE investigation in the country is led by researchers at the North West University and the University of the Western Cape and over 2 000 participants are enrolled at each site.

Also useful in providing epidemiological data to track NCDs and their risk factors in SA are health and socio-demographic surveillance sites (HSDSSs). In SA these include the Agincourt HSDSS and Africa Centre site in Hlabisa.^{80,81} However, these HSDSSs are currently based in rural parts of the country. A need exists to expand this work to different parts of the country so that issues such as rural-urban differences in NCDs, societal differences in NCDs and, more importantly, the drivers of the risk factors can be identified.

Conclusion

Chronic NCDs among South Africans are on the rise. Although NCDs affect all population groups, the poor are at increased risk because of their exposure to structural and environmental factors that are beyond their control.

The good news is that the South African government has made significant strides in formulating and implementing policies to address NCDs. These policies include strengthening tobacco control; enforcing Regulations relating to food; and implementing policies to reduce alcohol use.

Public health interventions need to be targeted at individual behavioural risk factors; however, these interventions need to be implemented in conjunction with policy responses whose aim is to address the structural environment in which these risk factors are shaped.

In addition there is a need to focus on structural determinants of health as they are more distal than behavioural risk factors, which both health professionals and government tend to emphasise. Future research should focus on defining and tracing the explicit pathways through which structural determinants affect health.

Recommendations

- Comprehensive and integrated actions should be developed to prevent and control NCDs. A multisectoral approach needs to be adopted, including at policy and implementation levels.
- Actions to prevent NCDs should include:
 - Policies to deal with the built environment in order to address physical inactivity;
 - Community interventions that target those at risk and those already affected to prevent complications; and
 - Risk assessment tools applied at community level that identify those at risk and can be used by less qualified health workers such as community health workers.

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Public Health Impact of and Response to Climate Change in South Africa

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This chapter reviews recent developments relating to the impact of climate change on health and health services in South Africa. Since the COP-17 meeting in Durban in 2011, climate change policy developments have increased in all three tiers of government. Policies have mostly been general in scope and have not focused specifically on the health sector, with a few notable exceptions. A national climate change and health adaptation policy has been finalised. At least two provinces, the Western Cape and KwaZulu-Natal, have climate change strategy documents, and the City of Cape Town and eThekweni municipalities have specific climate change and health adaptation policies.

As the southern African region becomes hotter and drier, climate-sensitive aspects of the burden of disease are being identified. Analysis of disease trends and linkage of climate scenarios to future health impacts allows predictions according to which health systems responses can be planned. The climate readiness of health and related facilities and emergency responses is starting to be audited by government. Additional stress on the health system due to climate change underscores the importance of health system strengthening, primary health care re-engineering and the rolling out of the National Health Insurance system. Responses to climate change, whether by mitigation of its effects or adaptation to them, will require strong and effective intersectoral organisation and effort within government at all levels along with interdisciplinary research and prevention efforts. Examples of the implementation of these responses are provided by the Western Cape Province and City of Cape Town.

Additional stress on the health system due to climate change underscores the importance of health system strengthening, primary health care re-engineering and the rolling out of the National Health Insurance system.

Introduction

Reflection on public health responses to climate change in South Africa (SA) provides a gauge of whether or not health is truly playing a central role in the climate change arena. Chapter 12 of the 2010 *South African Health Review* (SAHR) set the stage for consideration of global and South African impacts of climate change on health and health services.¹ McMichael, in his chapter on Climate change and human health, included in a Commonwealth Health Minister's Update publication in 2009, puts it succinctly "human health can – indeed should – be viewed as the real 'bottom line' of climate change consequences".²

In recent years increasing attention has been paid to the risks related to health, and subsequently health services. The most notable in terms of global developments was the hosting of the first Global Climate and Health Summit organised by Health Care Without Harm³ at the Conference of the Parties (COP)-17 in Durban. This Summit culminated in the Durban Declaration on Climate and Health⁴ and the sounding of an urgent call to action from the health sector.⁵ The Durban Declaration (Box 1) highlighted the need to recognise the health benefits of climate mitigation and to take steps to reduce global greenhouse gas emissions; ensure greater health sector representation on national delegations; and actively include

the participation of women and youth and indigenous people in the climate change process. A global call whereby public health practitioners, healthcare professionals and health government officials, among others, are called to endorse the Call to Action and to take concerted effort was also made (Box 2).

As alluded to above there is an increasing focus on the carbon footprint of health care. The Sustainable Development Unit of the United Kingdom's National Health System has developed valuable guidance materials relevant for SA for reducing carbon emissions from health care.⁶ 'Greening' the health sector is an increasingly articulated goal worldwide, and Health Care Without Harm has set up a global 'green' hospital network with a detailed global agenda for action that is pertinent to the South African health sector.⁷

The 2012 Climate Vulnerability Monitor report of the Climate and Health Alliance entitled *Cold Calculus for a Hot Planet* estimates the cost of failure to act on climate change at US\$ 1.2 trillion, with 400 000 excess deaths annually and an increase in this number to 700 000 by 2030.⁸ To put this in perspective, the World Health Organization (WHO) estimates that there are 80 000 malaria-, 60 000 extreme weather event-, 2.2 million diarrhoea-, and 3.5 million undernutrition-related deaths annually.⁹ AIDS, which has

Box 1: Durban Declaration on Climate and Health, Durban, 4 December, 2011

The World Health Organization predicts that unmitigated climate change will lead to significant increases in illness and death brought on by environmental changes. These include the spread of cholera, malaria, dengue and other diseases; the compromising of agricultural production and food security; an increase in extreme weather events, floods, droughts, heat waves and more. The health of many communities is already suffering as a consequence of climate change.

Indeed, according to the Lancet, climate change is the greatest global health threat of the 21st century.^a

At the same time, there is strong evidence that action on climate change can deliver significant and immediate benefits to health. For instance, lowering greenhouse gas emissions from fossil fuels will also simultaneously reduce harmful air pollution that negatively impacts the health of millions of people around the world.

Here in Durban, at the UNFCCC's 17th Conference of the Parties, the world's governments have an opportunity to confront this threat and agree upon solutions. Governments can commit to reduce greenhouse gas emissions in a manner that is equitable, as well as economically and ecologically viable. Such effective and immediate action to mitigate climate change would protect and advance global public health.

An agreement that aims to avoid dangerous climate change, keeping global temperature rise below 2 degrees Celsius, must promote a transition from fossil fuels to clean, renewable energy and low carbon economies. It must foster major emissions reductions from those who pollute the most, while providing support for those least responsible for the crisis to develop a low carbon pathway that meets peoples' needs. Such an agreement would have the added benefit of protecting local communities and large urban populations from the immediate health impacts of fossil fuel production and combustion, thereby reducing healthcare costs and saving lives.

Without such an agreement, climate change will increase the global burden of disease and deepen health inequities between and within countries. This will raise health care costs worldwide, while undermining and overwhelming public health infrastructure in both rich and poor countries. The overwhelming burden will fall on the most vulnerable – those living in poor countries, who have contributed least to greenhouse gas emissions.

Having gathered at the first Global Climate and Health Summit, in Durban on December 4, 2011, we—as health professionals, public health advocates, and healthcare policy makers from more than 30 countries—hereby call on national delegations to the UNFCCC's 17th Conference of the Parties to:

- ❖ Recognize the health benefits of climate mitigation and take bold and substantive action to reduce global greenhouse gas emissions in order to protect and promote public health.
- ❖ Ensure greater health sector representation on national delegations as well as within key mechanisms of the UNFCCC, recognizing the role of the World Health Organization as the voice for public health within the UN system.
- ❖ Actively include the participation and empowerment of youth, women and indigenous peoples in the climate change processes.
- ❖ Adopt a strong second commitment period of the Kyoto Protocol which currently includes emission reduction targets for the time until 2012, to protect and continue the only binding climate law the world has;
- ❖ By 2015, negotiate a fair, ambitious and binding agreement that, consistent with the Prescription for a Healthy Planet, endorsed by more than 130 health organisations in Copenhagen in 2009:
 - Places the protection of human health as a primary objective of any agreement.
 - Establishes an ambitious fair shares framework to reduce global emissions (based on the principles of Equity and Common but Differentiated Responsibilities and Respective Capabilities) in order to avoid a global public health disaster.
 - Fosters both energy efficiency and clean, renewable energy that protects public health by reducing both local and global pollution.
 - Provides the immediate necessary resources to operationalize the Green Fund, and in the longer term, appropriate mitigation and adaptation funding required to address the health impacts of climate change, assuring all countries' Rights to Sustainable Development and their ability to pursue a low carbon development pathway.

a "Managing the Health Effects of Climate Change" The Lancet, Volume 373, Issue 9676, Pages 1693-1733, 16 May 2009.

a major impact on the health system, has claimed at least one million lives annually in sub-Saharan Africa since 1998. A large proportion of these deaths occurred in SA – the country with the largest number of HIV-infected people in the world. In 2010, 5.6 million people were infected with the virus.¹⁰ Thus in SA, the impact of climate change is thought to be significant and will undoubtedly further stretch the capacity of the country to cope with an already high burden of disease that absorbs substantial public and private sector health resources

This chapter sets out to examine the impact of climate change on health and health services in SA. The conceptual approaches to examining the impact of climate change are first explored, followed by a presentation of findings from key literature on the topic, and a review of recent publications and activities since the 2010 edition of the SAHR. Public health sector responses, including integration approaches, and barriers and enablers are presented. The chapter concludes with a set of recommendations.

Conceptual approaches to examining the impact of climate change

Assessing the responses of SA's health services to the health-related vulnerabilities associated with climate change necessitates a conceptual framing of health in relation to climate change. It also requires an understanding of some key concepts in terms of addressing climate change, namely *mitigation*, which is the primary prevention of climate change and mainly focuses on

reducing greenhouse gas emissions and modified use of land, and *adaptation*, which is the term used to describe strategies and activities aimed at slowing down the impact of climate change.¹¹ "Vulnerability" refers to the physical, social and economic aspects of a system¹² and in the context of climate change the concept of vulnerability to climate change integrates exposure, sensitivity, health impacts and adaptive capacity as outlined in Figure 1.

Vulnerability = f (Exposure, Sensitivity, Adaptive Capacity)

Robert T. Watson, Chair of the Inter-Governmental Panel on Climate Change, defines vulnerability as:

the extent to which a natural or social system is susceptible to sustaining damage from climate change, and is a function of the magnitude of climate change, the sensitivity of the system to changes in climate and the ability to adapt the system to changes in climate. Hence, a highly vulnerable system is one that is highly sensitive to modest changes in climate and one for which the ability to adapt is severely constrained.¹³

More simply put, the greater the exposure or sensitivity in terms of climate exposure, the greater the vulnerability. Furthermore adaptive capacity is inversely related to vulnerability.¹² The Know Climate Change web resource poses an example illustrating that reducing vulnerability would for example be attempting to reduce exposure to adverse climate through implementing specific measures such as building a dyke in the case of a rise in sea level, whereas increasing adaptive capacity would encompass implementing activities that are closely aligned with development

Box 2: Protecting Public Health From Climate Change – A Global Call to Action Launched in Durban, South Africa – 4 December, 2011

We know that, according to The Lancet, climate change is the greatest global health threat of the 21st century.^a

As leading healthcare providers, professionals and organizations, we know that the health impacts of climate change, such as the spread of vector-borne diseases, and the consequences of heat waves, droughts and extreme weather events are already being felt around the world, particularly in sub-Saharan Africa, where more people die as a consequence of climate change than anywhere else.

We are profoundly concerned that as greenhouse gas emissions continue to rise unabated, dangerous climate change will magnify existing health crises, deepening and broadening the global burden of disease. This will in turn raise health care costs worldwide, while undermining and overwhelming public health infrastructure everywhere. The overwhelming burden will fall on the most vulnerable – those living in poor countries, who have contributed least to greenhouse gas emissions.

We also know that what is good for the climate is good for health, and that an equitable resolution to climate change will result in major health benefits worldwide. Given the gravity and urgency of the situation – and the opportunity to promote public health by addressing climate change we call on our colleagues in public health organizations, health professional associations, hospitals, health systems and ministries of health around the world to endorse this Call to Action and take concerted action.

Having convened at the first Global Climate and Health Summit in Durban, South Africa, we hereby commit to:

1. **Provide Leadership:** As representatives of our organizations, we will drive the agenda for climate and health, promoting this Call to Action throughout the world.
2. **Engage and Inform:** We will engage and inform our constituencies of millions of doctors, nurses, public health workers, hospitals, health systems and health policy makers about the health risks from climate change, and the health benefits of climate action. As health professionals, we will also serve as messengers to our patients, our communities and our governments about the major health impacts of climate change and the steps they can take to reverse their impact.
3. **Mitigate:** We will lead by example and reduce the carbon footprint of our own institutions, practice and activities. We will strive to make our hospitals greener and healthier by reducing waste, investing in energy efficiency and clean energy sources, while promoting sustainable transport and resource consumption. By doing so, we commit to demonstrating how our societies can move toward carbon neutrality.
4. **Adapt:** We will strive to make our health systems more resilient and capable of withstanding and responding to the human toll of natural disasters, growing under-nutrition and the shifting burden of disease.
5. **Advocate Locally and Nationally:** We will work within our countries to advocate for emissions reductions and/or low-carbon development strategies that promote both a healthy climate and public health. We will call for solutions that reduce the local health impacts of fossil fuels; solutions that foster clean energy and social justice; solutions that save lives and money while protecting public health from climate change.
6. **Advocate Globally:** We will advocate for a fair and binding global agreement, as articulated in the Durban Declaration on Climate and Health, that:
 - Places the protection of human health as a primary objective of any agreement.
 - Establishes an ambitious fair shares framework to reduce global emissions (based on the principles of Equity and Common but Differentiated Responsibilities and Respective Capabilities) in order to avoid a global public health disaster.
 - Fosters both energy efficiency and clean, renewable energy that protects public health by reducing both local and global pollution.
 - Provides the immediate necessary resources to operationalize the Green Fund, and in the longer term, appropriate mitigation and adaptation funding required to address the health impacts of climate change, assuring all countries' Rights to Sustainable Development and their ability to pursue a low carbon development pathway.

a "Managing the Health Effects of Climate Change" The Lancet, Volume 373, Issue 9676, Pages 1693 1733, 16 May 2009.

priorities.¹² Thus better adaptive capacity leads to less vulnerability.

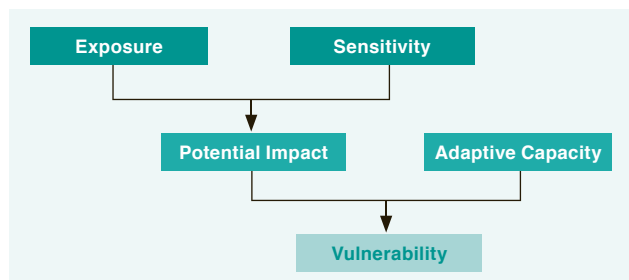


Figure 1: Components of vulnerability

Source: Government of Western Australia, 2008.¹⁴

Figure 2 shows that climate and climate change exposures are determinants of health and in terms of proximity are situated 'upstream' of individual biological and behavioural and societal determinants of disease. For instance, an extremely hot climate exposure can impact the cardiovascular system, particularly of the aged who are more sensitive, and who may be unable to modify their behaviour to remain cool, or be unable to afford or access a cool built environment (infrastructural changes) leading to an increased risk of stroke or heart attack fatality. The concept of risk factors as presented in the conceptual model presented in Figure 2 is expanded upon in Figure 3.

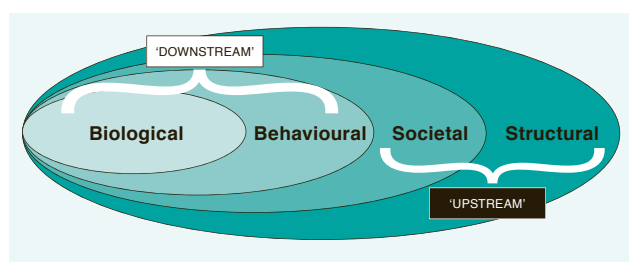


Figure 2: Conceptual model of risk factors for disease

Source: Western Cape Burden of Disease Reduction Study, 2008.¹⁵

Figure 3 provides a useful conceptual model that shows the complex causal connections between climate-related exposures, and direct and indirect adverse health outcomes. Moving from left to right across the columns the possibility of complex causal links from climate change variables like temperature can be seen to act *directly* and more simply on health in the form of a heat-related stroke, or more *indirectly* through causing change in the quantity and quality of water leading to an increase in mosquitoes and increasing the risk of infectious diseases like malaria. Socio-economic factors like wealth of the individual or society will modulate this causal chain by interrupting it. Figure 3 can be used to systematically understand the health implications of climate change.¹⁶

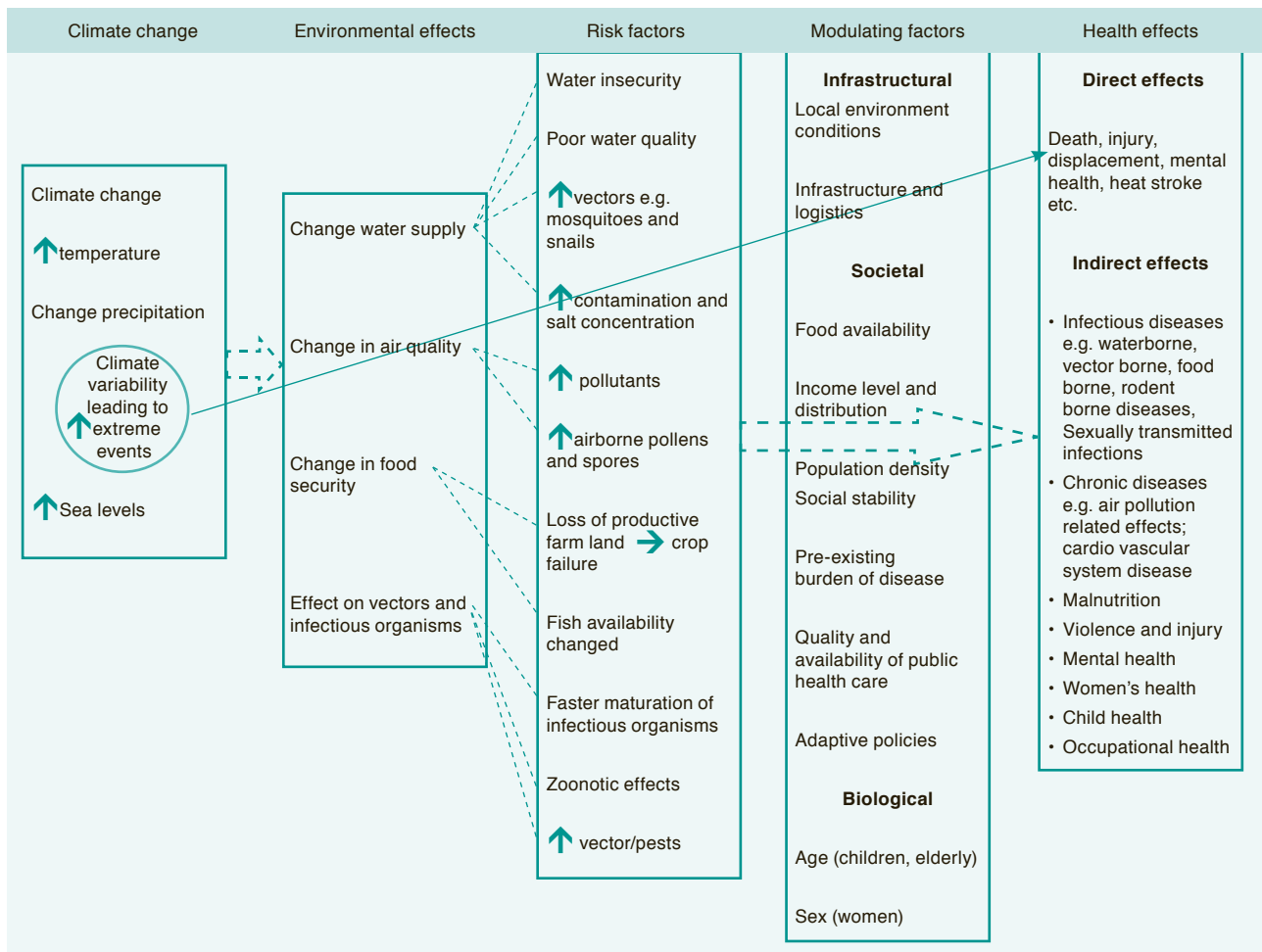
SA is described as having a quadruple burden of disease that consists of four epidemics – the major infectious diseases (HIV and tuberculosis), intentional and unintentional injury, chronic disease (including mental health disorders) and maternal and child mortality.¹⁷ The current distribution of the burden of disease in SA is a useful starting point for considering the potential impact of climate change exposure on the future burden in this country. An article outlining a public health approach to the impact of climate change on health in southern Africa discusses the indirect negative effects of climate change on conditions that plague the public health systems of these countries, such as infectious diseases, violence and injury, mental health, chronic diseases, malnutrition, women's and child health, and occupational health.¹⁸

When considering how to address climate change and its potential impacts, it is important to recognise that both health outcomes and exposure risks are amenable to prioritisation. For instance, a particular geographical area might be particularly susceptible to drought. If the health profile of the population in that area is known this will provide an indication of the priority health issues, which might be aggravated by a bout of or increasing drought. It is then possible to consider how individuals and society might adapt to optimally reduce the impact of the changed climate and prevent anticipated worsening of health status in that area. Thus the ability to prioritise climate exposures and the consequent health outcomes helps to identify principal vulnerabilities in a group living within that geographical area. This would therefore create opportunities to identify potentially modifiable risks and, as part of mitigation or adaptation strategies, implement proven or promising preventative interventions. An example could be that drought might be modified by developing an irrigation scheme, and the ability to do so is an example of the capacity for adaptation (see Figure 1) to limit potential negative health impacts. Health services constitute a key aspect of adaptive capacity as a consequence of primary and secondary preventive interventions to limit adverse health impacts, along with other individual and social responses.¹⁹

Box 3: Examples of adaptation strategies

- ❖ Establish/improve surveillance/early warning systems
- ❖ Disaster preparedness
- ❖ Better urban planning and housing design (climate-proofing, insulation, mosquito control)
- ❖ Improve infectious disease control programmes (vaccines, vector control, case detection and treatment).
- ❖ Institute community-based neighbourhood support activity
- ❖ Mobilise community partnerships and actions to identify and solve health problems.
- ❖ Ongoing monitoring & evaluation of adaptation strategies.

Figure 3: Impact of climate change on health



Source: Myers et al., 2011.¹⁶

Given the availability of health and climate data, and statistics for different geographical localities, it becomes possible to examine the associations between health status and climate exposures as these change over time. It would then be possible to determine which adverse health conditions are climate-sensitive and which in turn help to predict adverse health impacts and likely future demands on the health and social services under different future climate scenarios.

Findings from the literature

There have been several recent publications relevant to climate change and health. As referred to above, an overview of climate change and health in southern Africa was published in 2010.²⁰ A public health approach to health and climate change in SA,¹⁸ the elaboration of a potential research agenda,²¹ and a special issue of the journal *Continuing Medical Education (CME)*²² appeared in 2011. The CME issue integrated broader sustainability and public health issues with the impacts of climate change on health systems, health and lifestyle interventions and the practice of clinical medicine at the primary care level. The implications for community involvement in health care facilities in adapting to climate change were examined. Smit et al.²³ examined climate change and health in the context of urbanisation and the built environment.

More specific health impacts of climate variability and change are increasingly being studied in SA, focusing on climate-sensitive health outcomes like diarrhoeal, respiratory, cardiovascular and vector-borne infectious diseases (e.g. malaria). High and low temperatures, along with high precipitation and drought, have been shown to influence morbidity as measured by hospital admissions and mortality.²¹ Scovronick and Armstrong provide evidence for housing type modifying temperature-mortality relationships. Specifically, informal housing was associated with higher temperature-related mortality while traditional housing in rural areas was more protective than informal urban housing.²⁴ Mathee et al. found decreased productivity in outdoor workers exposed to high temperatures.²⁵ Modelling predicts no overall increase in malaria incidence for sub-Saharan Africa, but rather a shift of vectors and malaria infection incidence from west to the south and east as climate change impacts with increasing temperatures and precipitation.^{26,27} However, the incidence of malaria cases in SA has been declining over recent years as a result of a shift in preventative interventions targeting mosquitos, such as the reintroduction of DDT and its replacement of vector-resistant products such as Deltamethrin.

Significant limitations in the published research include unavailability of data²⁸ (especially at a small scale for both climate determinants and health outcomes), lack of a clear conceptual model for causal pathways from climate exposures to health outcomes, a lack of integrated or complex assessment methods, as well as poorly developed intersectoral perspectives and interdisciplinary engagement and experience in government and academia.¹⁸

Recent breakthroughs in the mechanistic understanding of tuberculosis (TB) susceptibility and vitamin D deficiency have shown seasonal and hence climate sensitivity.²⁹ It might be that increasing temperatures and less precipitation will increase resistance to TB in the southern part of SA.

Public health sector responses

Societal responses to adverse health impacts of climate change will be driven by anticipated changes in the burden of disease. They will also be limited by current and future service delivery capacity in the health and social services. It is anticipated that there will be many extra demands on these services due to climate change over and above the usual demands.³⁰

Prevention as the core activity of public health is multi-layered. Primary prevention of adverse health effects of climate change targets its root cause. This involves mitigation activities such as the reduction of greenhouse gases in the atmosphere. The health sector is increasingly being recognised as an important site of mitigation interventions, especially where both public and private sectors are substantial, as in SA, and where the size and reach of the health sector is set to expand with the introduction of National Health Insurance.⁶

Secondary prevention of climate change health impacts involves adaptation in anticipation of likely health impacts of expected climate changes, such as the provision of accessible cool facilities in communities on extremely hot days or once these changes have already occurred (e.g. better insulation of homes).⁹

Primary mitigation interventions are longer-term global solutions. More local adaptation interventions as secondary prevention of adverse health impacts would seem to be the major social response activity in the short- to medium term. To this end, an adaptation policy is being taken seriously by the South African Government at all levels and recent policy developments have occurred at national, provincial and municipal levels that have given rise to climate change and health adaptation plans. For example, in the Western Cape Province, there is an existing municipal climate change and health adaptation plan³⁰ and a provincial climate change adaptation strategy covering health since 2008,³¹ which is currently undergoing revision. The National Climate Change and Health Adaptation Policy³² was finalised in October 2012.³⁴ The eThekweni municipality in KwaZulu-Natal has a well-developed climate adaptation plan, which covers adaptation for health. Other provincial governments and local authorities (with some exceptions in the Eastern Cape) by contrast do not yet appear to have given systematic attention to the climate change health adaptation policies. Thus the response rate measured by provincial preparedness for addressing climate change in health terms is slow.

Table 1 integrates likely climate-related health outcomes (health vulnerability) with the health system responses required for successful adaptation to prevent these outcomes. Principal health systems adaptation activities involve data collection and the capacity to monitor population health and health facility readiness for anticipated climate-related impacts. Early warning systems for extreme weather events and effective response capacity at emergency services, health services and community levels will be critical. Disaster management stands out as a key response capacity, given anticipated extreme weather events that include heat waves, floods, droughts and storm surges.

Table 1: Health vulnerability determinants, facilities readiness, surveillance, monitoring and evaluation

VULNERABILITY/HEALTH IMPACT ASSESSMENT				FACILITIES READINESS ASSESSMENT			ADAPTATION INTERVENTION EVALUATION		
Climate change exposures	Environmental effects	Sensitivity	Adaptive capacity	Health impact	Current adaptive practices	New/proposed adaptation interventions	Monitoring & surveillance	Evaluation	
Temperature	Water – insecurity, quality, vectors, pollutants, contamination, salinisation, sanitation	Quadruple Burden of Disease – HIV, Infectious Disease, Chronic Diseases, injury and violence	Structures and Policies in place for climate change and health adaptation	Direct:	Readiness for disasters and projected increases	Enhance readiness of at-risk facilities	Disease surveillance system	Audit to identify non-robust clinics at risk from climate change effects	
Precipitation – shifts in frequency, intensity and seasonality	Air – quality (indoor and outdoor), pollution, pollens, spores, increased temp. inversions	Disrupted infrastructure of health care, water and sanitation	Implementation possibilities and assessment tools	Death, injury, displacement, heat stress, hypothermia, mental health, burns, drownings	Disaster and risk management policies and emergency plans (water and power supply; cold chain; transport routes)	Service level agreement with provinces to provide uncompromised health care despite climate change effects	Service load surveillance system	Review policies and plans regularly in the light of anticipated climate change effects	
Extreme events, weather and wind, floods, fires, storms	Food security – productive land decrease, crops and fish decline	Nutritional status, food security, food hunger	Infrastructure and Logistics,	Indirect:	Public sector clinic services	Service level agreement with provinces to provide uncompromised health care despite climate change effects		Annual review of service level agreements	
Sea level rise	Vectors and infectious organisms: faster growth, bigger populations, zoonoses, rats, birds	Demand overload on public health care due to disasters, and/or migration from other disaster areas	Facilities readiness (tools)	HIV +/-increase	Capacity to deal with climate-related diseases	Increase capacity eg. Annual diarrhoeal disease plan overseen by climate change committee; follow-up of notifiable diseases; Expanded Programme on Immunisation	Disease notification system		
		Major infectious diseases HIV, TB	Emergency services readiness – water, food, energy	TB increase	Capacity to deal with climate-related water-related disease vectors	City-wide plan for management of all significant water bodies; framework policy on urbanisation	Monitoring of water quality; reuse removal; sanitation		

VULNERABILITY/HEALTH IMPACT ASSESSMENT				ADAPTATION INTERVENTION EVALUATION		
Climate change exposures	Environmental effects	FACILITIES READINESS ASSESSMENT		New/proposed adaptation interventions	Monitoring & surveillance	Evaluation
		Sensitivity	Adaptive capacity			
		Informal housing/settlements, poor ceiling insulation and ventilation, damage in extreme events	Income	Waterborne enteric disease increase (diarrhoeal diseases)	Extend: handwashing campaigns, health and hygiene projects, health promotion outreach, diarrhoeal disease prevention and treatment. New training in air quality management (cooking fuels and heating)	Level of public awareness of the dangers, prevention and response to climate-related illnesses
	Poor basic services water supply in dwellings, sanitation, energy	Equity		Air pollution respiratory disease increase (asthma, allergic rhinitis)	Air quality and climate change relationship (UCT);	
	Indoor/outdoor air pollution	Crowding density		Food-borne diseases Malnutrition	Research collaborations eg. Academic institutions, Medical Research Council, Centres for Disease Control, Western Cape Department of Health, National Institute for Communicable Disease	Changes in epidemiology of vector-borne diseases (National Institute for Communicable Disease; Promed; Western Cape Department of Health); air quality monitoring; impacts of extreme events
	Lack of social amenities, health services, security services, communal, recreational	Quality and availability of public health services		Vector-borne – Malaria, dengue fever increase		
	Socio-economic stress/poverty/inequity	Quality and availability of ancillary services		Injury and violence – traffic crashes		
	Extremes of age – children and elderly			Mental health disorders, substance abuse, suicide		
	Women/single parent households			Cardiovascular diseases		
	Nutrition-infection interactions			Special risk groups – children, women and the elderly		
				Occupational health for emergency. Outdoor and hot processes workers		
				Environmental chemicals/pesticides		

At the time of COP-17 in November 2011, a draft national climate change and health adaptation plan was available. It underwent significant change between 2011 and 2012 and was finalised in October 2012.³¹ The previous exclusive focus on infectious disease was extended to cover all direct and indirect outcomes comprehensively. The plan outlines national intersectoral administrative structures and a course of action that links global and local knowledge to action at various levels of government.

In the Western Cape Province, an early climate change strategic plan that also covered health impacts was crafted as early as 2008, but the actual health content was limited.³² The provincial plan is currently being revised in a process spearheaded by the Department of Environmental Affairs and Development Planning with a concurrent process of sectoral plan development in the different departments, including health. In 2011 the City of Cape Town produced health-sector-based climate adaptation plans of action (CAPA) in much greater depth and breadth than the national and provincial plans showed. The City of Cape Town plan explicitly envisages the requisite intersectoral linkages key to promoting health and preventing adverse health impacts (e.g. the sectors managing water and air quality).

Integration

There are problems of integration across levels of government with little communication in the generation of national, provincial and municipal climate change and health adaptation policy development and planning. Similarly, there are challenges involved in working intersectorally across departmental silos within each level of government when it comes to climate change adaptation. Lack of integration is also reflected in academic institutions where climate change research and teaching are similarly silo-based and where the scope of activity is typically limited to disciplinary as opposed to interdisciplinary perspectives. For the health sector this is not new. Ever since the birth of the concept of Primary Health Care at the Alma Ata conference in 1978, progress in crossing sectoral divisions has been elusive.

However, the experience of the abovementioned provincial government shows that it is possible to institute the requisite transversal structures to facilitate and implement programmes that involve multiple sectors.³³ The province has set up a number of cross-sectoral structures that correspond to principal provincial strategic objectives. One of these transversal structures deals in a transversal manner with mitigation and adaptation responses to climate change and is headed by the Department of Environmental Affairs and Development Planning. The Provincial Department of Health has an active climate change committee, which has already contributed to its 2020 Health Plan and is currently embarking on a climate change readiness audit of its facilities. The audit will be guided by the considerations arising from knowledge of the provincial burden of disease^{15,16} and expected climate change and disease patterns under these changes for the province. Similar audit work is being conducted for mitigation interventions across the province and within each of its departments. The transversal nature of these structures ensures that the health sector is an integral part of a "whole-of-government" approach to mitigation and adaptation and plays an important role in advancing a "health in all policies" approach. This provides a working example of what a provincial

government can do.

Slow progress with intersectoral action in government has its counterpart in the academic community where inter-disciplinary climate change research is still in its infancy. Lack of integrated assessment methodologies according to which researchers using different approaches from different disciplines can pool their knowledge and gain greater understanding of the impacts of climate change is a limitation.

There is currently little evidence-informed adaptation activity in the health sector. Risk assessment for climate change has not yet been implemented apart from in the cities of Cape Town and eThekweni. Isolated local examples of green healthcare facilities exist such as the management practices at the Lentegeur Psychiatric Hospital in Mitchell's Plain and the green design Khayelitsha Hospital in Cape Town.

Barriers and enablers

Barriers to adaptive climate change interventions include weaknesses in public sector service delivery, economic and financial constraints, a culture of poor service provision, and disorganisation at community level. Intersectoral approaches and local community organisations are enablers, but attempts to get all these agencies working together are not often successful.³³

Conclusions

McMichael has pointed out that climate change will not add wholly new dimensions to the burden of disease or demands on the capacity of health systems to address these.² Health impacts of climate change will in all likelihood be closely linked with the current distribution of the burden of disease. Climate change will amplify those components that are in any way climate sensitive. Wholly novel health threats are not anticipated.² Climate change, however, will aggravate existing problems besetting a weak health sector, and will alter the distribution of demands on the health system. Unexpected positive and adverse health impacts may arise directly or indirectly from climate change, such as more ultraviolet radiation improving vitamin D status of dark-skinned populations in the southernmost regions of the country. They may also arise as unintended results of mitigation or adaptation interventions. Health service capacity development (e.g. PHC re-engineering) will consequently need to be aligned with anticipated and actual impacts of climate change, thus necessitating adaptation plans in all provinces.

There is a growing availability of useful guidelines and tools aimed at mitigation of carbon emissions from the health sector. These can be usefully applied in SA at all levels of health facilities from the primary care level through to tertiary hospitals. There are useful local examples of green healthcare facilities that could be used as test cases and emulated if successful.

Key priorities for adapting to climate change in the health sector emerge from a consideration of the modifiability of the burden of disease and its associated health determinants for which data exist currently only at national level and for one province at provincial level. These data need ultimately to be available at the most local level for effective prevention.

There is little current research into climate change and health. This remains a difficult area limited by poor data availability and the complexity of the chain of causation along with uncertainties inherent in predicting climate change, especially at fine resolution in different localities around the country. For example, reliable climate predictions are currently limited to large areas and are not accurate for districts, suburbs or neighbourhoods. The same applies to health data, which are typically only available in the aggregate at provincial level. Important limitations include weak or absent data, lack of structural support for interdisciplinary thinking and research, intersectoral policy development and implementation. The silo mentality in government at all levels and the disciplinary nature of most academic research constitute strong barriers to vulnerability reduction.

The current South African national energy and transport policy is at odds with climate change and is likely to contribute negatively to both global and local health impacts. This is another example of the need for intersectoral collaboration both at the policy and intervention levels.

The situation with regard to other southern African countries is even less promising with regard to climate change health adaptation.¹⁵ SA could be an example for other countries, if adaptation interventions are successfully implemented nationally, provincially and at the local level.

Recommendations

In SA as well as globally we need to move as rapidly as possible to gain a better understanding of climate change and health. This involves better understanding of current climate-related fluctuations in morbidity and mortality, and the quantum of the burden of disease that is climate sensitive. Climate-sensitive burden of disease needs to be put together with climate scenarios modelled from local climatological data at the finest scale available to fully understand the health equity implications of likely changes. All this requires access to reliable and valid mortality and morbidity data, which currently are only available at national level, to some extent at the provincial level, but little of which is available at the level of the district and sub-district. Policy support is required for better institutional data acquisition and surveillance systems to be constructed.

Society's response in the health and health-related sectors needs strengthening. Transversal or cross-sectoral organisational structures and perspectives are essential as vehicles for policy development and especially implementation. An example of provincial buy-in and support exists, with policy makers and management being proactive in developing a series of transversal structures to match its strategic objectives, which involves the whole of government as well as partners outside of government. Such structures are essential for developing successful adaptive interventions and need to be further supported and implemented. The operating principle of "health in all policies" lays the foundation for intersectoral thinking from the point of view of the health sector.

Climate change health adaptation policies are still at an early stage of development at all levels of government and have a long way to go in order to be implemented by integration into the normal operations of public services. Data are critically important for the necessary monitoring and evaluation functions that track policy

implementation. Early warning systems of climate stressors, early identification of climate-sensitive conditions, early mobilisation of disaster and emergency response services and continuous evaluation are key ingredients for successful adaptation.

While much may be learnt from the results of research, policy and service development, particularly in the developed world, local preventive interventions will need to be appropriate for less developed and resource-constrained conditions and realities. Much more local research is needed, but there should be few illusions about the difficulties in linking upstream climate-related health determinants to health outcomes at the end of the causal chain.

There is considerable scope for research, development and collaborative work between academic institutions and the health system. More specifically, the biggest contributors to the burden of disease, their climate sensitivity and the modifiability of their associated risk factors should be targeted for priority attention.

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The State of the National Health Research System in South Africa

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Knowledge produced by health research contributes to the improvement of the health of individuals and populations. This knowledge also contributes to the development of evidence-informed policies and the enhancement of performance of health systems. Using existing and new knowledge adapted to local conditions is particularly crucial in achieving the Millennium Development Goals. To achieve these and other health-related goals, a well-functioning health system must be able to produce, access and utilise research-based knowledge and the products of research.

A well-functioning health system must be able to produce, access and utilise research-based knowledge and the products of research.

The purpose of this chapter is to assess the performance of the national health research system that was envisaged by the Health Research Policy of 2001, and to highlight the recommendations of the National Health Research Summit of 2011 on the strengthening of research and development in South Africa (SA). The health research enterprise in SA is dominated by a small core of productive researchers, who are largely externally funded and focus on HIV, AIDS and tuberculosis. The representation of black research leaders is low.

The key priorities for strengthening the health research system are related to increasing funding from local governmental and non-governmental sources, developing human resources for health research, building the infrastructure for clinical research in academic health complexes, providing dedicated funding for priority health conditions, and improving the national regulatory framework for clinical trials.

Furthermore, there is a need for the development of a national system for the planning of research and its translation into policy, programmes, and practice. Finally, the health research system requires a mechanism for monitoring and evaluation to serve as a 'feedback loop' for the development of a robust health research system that is geared to addressing the priority health needs of South Africans.

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Introduction

Knowledge produced by health research is a global public good.^{1,2} Knowledge contributes to the improvement of the health of individuals and populations, to the development of evidence-informed policies and the enhancement of performance of health systems.^{1,3} Using existing and new knowledge adapted to local conditions is particularly crucial in achieving the Millennium Development Goals.⁴ To achieve these and other health-related goals, a well-functioning health system must be able to produce, access and utilise research-based knowledge.² The Commission on Macroeconomics and Health and the Consultative Expert Working Group on Research and Development Financing and Coordination have recommended a substantial increase in health research investments globally.^{5,6} It is universally accepted that health research and scientific knowledge play a central role in addressing the prevention and control of diseases and conditions that afflict populations.

Expenditure on medical research provides a huge economic return on investment – whether measured in terms of dollar value of lives saved, health costs saved, or jobs created.⁷ Three global commissions have repeatedly demonstrated that health research is not given its proper role in improving health, equity and development in lower- and middle-income countries.^{5,8,9} The Commission on Health Research for Development was among the first to recommend that lower- and middle-income countries should spend at least 2% of their health programme budgets on health research and that donors should match this with an allocation of 5% of their (externally provided) health programme funding. These percentages have been endorsed in subsequent ministerial declarations^{10,11} but allocation of these funds has been difficult to measure and has rarely been achieved.¹

The historic strengths and weaknesses of South Africa's participation in the global enterprise of medical research were reviewed recently in a report on the revitalisation of clinical research undertaken by the Academy of Science for South Africa (ASSAf).¹² The report examines the legacy of colonialism, racism and inequality in medical research, and demonstrates how this history has shaped relationships between researchers, government, industry and the South African public. After 1994, significant strides were made in

re-orienting health care and medical research towards the needs of the majority at a policy level. The philosophy of essential national health research was embraced, which culminated in the publication of the Health Research Policy of 2001, which sought “to develop a national health research system that contributes to equitable health development.”¹³

The purpose of this chapter is to assess the performance of the national health research system as envisaged in the Health Research Policy of 2001. Another purpose is to highlight the recommendations of the National Health Research Summit of 2011 on the strengthening of research and development in South Africa (SA). This assessment is conducted within the framework presented by Pang et al. for national health research systems.¹

A framework for national health research systems

A health research system is located at the intersection between the health system and the research system of a country.¹ In SA, the health system is the responsibility of the Department of Health whereas the research system is under the purview of the Departments of Science and Technology, and Higher Education and Training. The National Health Research Committee, which is a statutory body established in terms of the National Health Act (Act 61 of 2003),¹⁴ is located in the Department of Health and is mandated to ensure that there is coordination between the activities of the public institutions (such as the Departments of Health, Science and Technology, and Higher Education and Training) in the development and management of the national health research system.

In terms of the framework of Pang et al., a health research system has two intrinsic goals: the advancement of scientific knowledge and the utilisation of knowledge to improve health and equity.¹ The fundamental functions of a health research system include stewardship, financing, creating and maintaining resources, and producing and using research. The state of national health research is examined in the following sections, according to the fundamental functions of a national health research system. (See Table 1.)

Table 1: Summary of the functions and operational components of health research systems

Function	Operational component
Stewardship	<ul style="list-style-type: none"> • Define and articulate vision for a national health research system • Identify appropriate health research priorities and coordinate adherence to them • Set and monitor ethical standards for health research and research partnerships • Monitor and evaluate the health research system
Financing	Secure research funds and allocate them in an accountable way
Creating and sustaining resources	Build, strengthen, and sustain the human and physical capacity to conduct, absorb, and utilise health research
Producing and using research	<ul style="list-style-type: none"> • Produce scientifically valid research outputs • Translate and communicate research to inform health policy, strategies, practices, and public opinion • Promote the use of research to develop new tools (drugs, vaccines, devices, and other applications) to improve health

Source: Pang et al., 2003.¹

The state of the South African national health research system

Stewardship

Stewardship is concerned with oversight of the entire health research system and is intended to cover both the public and private sectors.¹⁵ Two statutory bodies are entrusted with the stewardship of the national health research system in SA: the National Health Research Committee and the National Health Research Ethics Council, both of which are located in the Department of Health. The National Health Research Committee has a legislative mandate to advise the Minister of Health on health research priorities. In identifying health research priorities, the National Health Research Committee takes into account the following:

- the burden of disease;
- the cost-effectiveness of interventions to reduce the burden of disease;
- the availability of human and institutional resources for the implementation of interventions closest to affected communities;
- the health needs of vulnerable groups such as women, older persons, children and people with disabilities; and
- the health needs of communities.

Furthermore, the National Health Research Committee is required to:

- determine the health research to be carried out by public health authorities;
- ensure that health research agendas and research resources focus on health priorities;
- develop and advise the Minister on the application and implementation of an integrated national strategy for health research; and
- coordinate the research activities of public health authorities.

The new National Health Research Committee for the 2011-2013 term convened a National Health Research Summit of health research stakeholders in July 2011.¹⁶ The National Health Research Committee is carrying out the task of defining and articulating the vision for a national health research system and identifying health research priorities through a consultative process that involves the key actors in health research from academia, industry, and government.¹⁶ Through this work, the National Health Research Committee has highlighted the essential role for investment in health research to achieve a long and healthy life for South Africans,¹⁷ and has identified seven priorities for the strengthening of the national system for health research.¹⁶

In terms of its key functions the National Health Research Ethics Council, which sets and monitors ethical standards for health research and research partnerships, is required to:

- determine guidelines for the functioning of health research ethics committees;
- register and audit health research ethics committees;
- set norms and standards for conducting research on humans and animals, including norms and standards for conducting clinical trials;

- adjudicate complaints about the functioning of health research ethics committees and hear any complaint by a researcher who believes that he or she has been discriminated against by a health research ethics committee;
- refer to the relevant statutory health professional council matters involving the violation or potential violation of an ethical or professional rule by a healthcare provider;
- institute such disciplinary action as may be prescribed against any person found to be in violation of any norms and standards, or guidelines, set for the conducting of research in terms of the National Health Act; and
- advise the national department and provincial departments on any ethical issues concerning research.

While the National Health Research Committee and the National Health Research Ethics Council may be considered to be effective in the majority of areas of their functions, there are areas of research stewardship that are neglected, such as planning, coordination, and monitoring and evaluation of the health research system.¹⁶

Financing

The 2008/09 National Survey of Research and Experimental Development (R&D) recorded gross domestic expenditure on R&D (GERD) of R21.0 billion for all research in SA, which was a nominal increase of R2.4 billion from the R18.6 billion recorded for 2007/08.¹⁸ The 2008/09 expenditure represents a 13.0% nominal increase over that of the previous year, but was insufficient to keep up with the increase in the nominal Gross Domestic Product (GDP) of 14.2% over the corresponding period. As a consequence, R&D expenditure, expressed as a percentage of GDP, dropped slightly from 0.93% in 2007/08 to 0.92% in 2008/09. The largest proportion of research and development expenditure is on engineering and natural sciences (45% of total research and development expenditure), while expenditure on the health sciences is 14.8% of the total (about 0.14% of GDP). SA is aiming to spend R45 billion on research and development and reach its target for gross expenditure on research and development of 1.5% of GDP by 2014.¹⁹

The procurement and allocation of funds for research is the second central function of a health research system.¹ There is consensus, however, that the health research system of SA is severely underfunded from local public and private sources.^{12,16} For example, the National Health Research Committee has estimated that the National Department of Health (NDoH) spent 0.37% (R416.5 million) of its health budget (R112.6 billion) in health research in the 2010/2011 financial year, which falls far short of the recommendation of the health research policy in SA of 2001 and subsequent undertakings by the Ministry of Health in Mexico¹⁰ and Bamako¹¹ to invest 2% of the health budget in health research.

According to the ASSAf report:

[t]he key narrative of clinical research in SA over the last two decades has been that of a largely unplanned, but cumulative, disinvestment in publicly funded programmes, resulting from the withdrawal of the health departments of provincial governments from this sector (academic hospitals are now funded for service functions only), the absence of discounts for research tests from the business model of the National Health Laboratory Service,

chronic underfunding of the Medical Research Council despite its obviously important mandate for maintaining and developing medical/clinical research capacity in the country, and the lack of funding streams to universities that might in principle have been applied to meet the overall shortfall in support.¹²

This policy trajectory has had a chilling effect on indigenous clinical science in the country over the past 10-20 years.²⁰

Creating and sustaining resources

Creating and sustaining human and physical resources for health research is the third central function of a health research system.¹ The key strengths of the South African health research system with respect to human and physical resources include having a small but productive core group of highly skilled researchers that comprise experts in laboratory, clinical and epidemiological aspects of HIV and AIDS and tuberculosis (TB), non-communicable diseases, maternal and child health, and violence and injury.¹⁶ There are also several large AIDS and TB clinical research units (in KwaZulu-Natal, Gauteng and Western Cape)²¹⁻²⁵ and demographic surveillance systems that are part of the international INDEPTH network (in KwaZulu-Natal and Mpumalanga).²⁶

The main weaknesses include the low level of funding for health research from the South African government in human and infrastructural resources for health research (e.g. less than 30% of total funding for HIV and AIDS and TB research comes from local sources), which is partly a manifestation of the relatively low level of government investment in research and development in general (0.92% of GDP in 2009). As a result, SA has a small number of researchers relative to other countries in the Brazil, Russia, India, China and SA (BRICS) grouping. For example, there are 1.4 full-time equivalent (FTE) researchers per 1 000 employed people in SA compared with 8.2 per 1 000 in Russia.¹⁸

This under-resourcing of the health research system in SA is associated with a dearth of training programmes and career paths for health researchers, and a virtual absence of clinical research centres that are funded by the state in the academic health complexes that have the statutory mandate to produce new knowledge.¹²

The deficit of human resources for health research is being addressed at a policy level through the new Human Resources for Health Plan.²⁷ This plan has made the revitalisation of education,

training and research one of its strategic priorities. The interventions and actions that have been identified are the growth of academic health practitioners through a doctorate driven National Health Scholars Programme²⁸ and the establishment of Research Chairs in Health Sciences in the future. This plan endorses the major recommendations of the report on clinical research of the ASSAf.¹²

Producing, synthesising and utilising research

The production of valid research disseminated in scientific publications in peer-reviewed and grey (non-peer-reviewed) literature, policy publications, reports, books or discussion papers, patents and new processes is the fourth function of the health research system.¹ Pouris reported the findings of a recent scientometric analysis of SA's research outputs during the period 2000-2010, which evaluated the effects of policy interventions on research publications.²⁹ A number of public policy interventions were introduced during the period under review, including the introduction in 2003 of a new funding formula that financially supports the higher education institutions according to their research outputs (number of publications and number of postgraduate students produced).³⁰ In contrast to earlier investigations by Pouris, it was found that SA's world share of publications had increased over the past decade.^{31,32} SA improved its overall international ranking by two positions during 2000-2010 and was ranked 33rd in the world during 2010 in terms of the absolute number of scientific publications in all fields of research.

The country's share in world literature has increased in all disciplines of health sciences from an average of 0.40 (2000-2004) to 0.60 (2006-2010) (Table 2).²⁹ The activity index, which is the ratio of the country's share of the world publication output in a given field to the country's share of the world publication output in all science fields, also increased in all fields of health sciences except for Clinical Medicine and Pharmacology and Toxicology (Table 2). An activity index of one indicates that the country's research output in the given field corresponds to the world average; an indicator larger than one reflects a higher-than-average emphasis in the field. The falling activity index in Clinical Medicine and Pharmacology may be regarded as a manifestation of the disinvestment in clinical science over the past 20 years that was identified in the ASSAf report.^{12,20}

Table 2: SA's world share and activity indices in health sciences and related disciplines

Discipline	2000-2004		2006-2010	
	World share	Activity index	World share	Activity index
Biology and Biochemistry	0.35	0.71	0.54	0.92
Clinical Medicine	0.40	0.82	0.45	0.76
Immunology	0.49	1.00	1.09	1.85
Microbiology	0.57	1.16	0.78	1.32
Neuroscience and Behaviour	0.17	0.35	0.22	0.37
Pharmacology and Toxicology	0.39	0.80	0.42	0.71
Psychiatry and Psychology	0.45	0.92	0.69	1.17
Overall	0.40		0.60	

Source: Pouris, 2012.²⁹

As presented in Table 3, a relative citation index above one indicates that the country's publications in the particular field attract more than the average citations in the world and an index of less than one indicates that the field attracts fewer citations.²⁹ Table 3 shows that all disciplines in health sciences are improving their impact except Psychiatry and Psychology. South African publications in Microbiology, Clinical Medicine, and Immunology attract more citations than the average citations in their fields. This shows that in Clinical Medicine, although the level of activity was declining in the period under review, the quality and impact of South African work in this field continue to improve. South African health researchers are publishing an increasing number of high-quality publications on priority conditions such as HIV and AIDS and TB in high-impact journals such as the *New England Journal of Medicine*, *Science*, *Nature Medicine*, and *The Lancet*.³³⁻³⁸

Table 3: Relative impact of South African publications during 2000-2004 and 2006-2010 in health sciences and related disciplines

Discipline	Relative impact	
	2000-2004	2006-2010
Biology and Biochemistry	0.56	0.81
Clinical Medicine	0.86	1.15
Immunology	0.71	1.09
Microbiology	1.00	1.27
Neuroscience and Behaviour	0.63	0.71
Pharmacology and Toxicology	0.58	0.70
Psychiatry and Psychology	0.67	0.61
Overall	0.72	0.91

Source: Pouris, 2012.²⁹

SA is emerging as a leader in Africa in the fields of the synthesis and utilisation of research findings. The South African Cochrane Centre at the Medical Research Council is part of the international Cochrane Collaboration, which is a non-profit organisation operating worldwide that disseminates up-to-date systematic reviews on the effects of healthcare interventions carried out in order to help people make well-informed decisions.³⁹ There are also several academic groups that are involved in translation and implementation science, such as the Knowledge Translation Unit at the University of Cape Town and the Priority Cost Effective Lessons for Systems Strengthening – SA (PRICELESS SA) at the University of the Witwatersrand.^{40,41} There is, however, no nationally agreed upon framework for the translation of research evidence into policy, programme and practice – such as the National Institute for Health and Clinical Excellence (NICE) in the United Kingdom (UK).⁴²

Key findings and recommendations

There is an increasing realisation of the need to promote indigenous health research in SA. The decline in investigator-initiated original clinical research activity in the mid-2000s prompted the ASSAf to produce recommendations for the revitalisation of clinical research, including increased funding, the training of a new cadre of health researchers, the establishment of clinical research centres, and improved regulation and planning of the health research enterprise.¹² The NDoH also recognised the essential role of health research in achieving a long and healthy life for all South Africans through its 10 Point Plan of 2009 to 2014, which includes “strengthening of research and development” as its 10th priority.⁴³

The National Health Research Committee acted upon policy directives of the NDoH by convening a National Health Research Summit in July 2011, which identified seven challenges and produced recommendations for the revitalisation of the health research system in SA. These are presented in Table 4.¹⁶

Table 4: Key findings and recommendations for the strengthening of the health research system in SA

Key finding	Recommendation
Financing: There is inadequate funding of health research by the Government of SA.	The NDoH should consider the progressive implementation of its commitment to the proportion of the national health budget allocated to research and development from 0.37% to 2.0% over the 2012-2014 period, as required by the National Health Research Policy of 2001 and commitments made in Mexico (2004) and Bamako (2008). This measure has the potential to lift the investment in health research from <R500 million at present to >R2 billion (fourfold increase).
Human Resources: There is a shortage of human resources for health research in SA, especially black South Africans and women.	The increased funding should be used to at least double the number of health researchers and academic clinicians over the next 10 years, in line with the Human Resources for Health Strategy of SA (2012/13-2016/17). The increased production of health researchers may be achieved by the creation of a 'National Health Scholars Programme' to fund doctoral studentships, post-doctoral fellowships, mid-career research posts, and research chairs in all healthcare fields, including medicine, dentistry and nursing.
Health Research Infrastructure: There is a lack of health research facilities and infrastructure in academic health complexes that are required by the National Health Act of 2003 to conduct research into priority health problems of South Africans.	The new funding should also be directed at developing the health research infrastructure of the academic health complexes. The ASSAf report on the revitalisation of clinical research identified the priority of creating clinical research centres in the academic health complexes to facilitate research occurring alongside service and teaching. Creating clinical research centres should form part of the hospital revitalisation programme in preparation for the introduction of the National Health Insurance scheme.
Priority Research Fields: The priority research areas are surveillance, knowledge translation, integration of care, health economic evaluation, diagnostics, therapeutics and vaccine development to address the quadruple burden of disease, social determinants of health, and strengthening the health system.	The new funding should also be used to create a National Priority Health Research Fund to stimulate and support new and innovative research programmes that address the research priorities related to the quadruple burden of disease, health systems strengthening, and combating the social determinants of health (that seek to achieve the outcomes of the Negotiated Service Delivery Agreement (NSDA) of the NDoH). These funds should be tied to measurable achievement of the objectives of the NSDA.
National Regulatory Framework: There is a cumbersome regulatory system for registration of new medicines and conducting of clinical trials under the Medicines Control Council (MCC).	The proposed South African Health Products Regulatory Authority should heed the recommendations of the ASSAf report on a progressive and efficient regulatory regime for health research in SA. ¹²
Planning and Translation: There is a virtual absence of national planning, coordination and translation of research into health innovations, policy, programmes and practice.	A process should be commenced to establish a body that is similar to the NICE in the UK in order to ensure the orderly translation of research.
Monitoring and Evaluation: There is a lack of national mechanisms for monitoring and evaluation of the performance of the health research system of SA.	Consideration should be given to the development of a monitoring and evaluation tool as a module of the National Survey of R&D of the Department of Science and Technology.

Source: [Mayosi et al., 2012](#).¹⁶

These recommendations, which have been accepted by the Ministry of Health,¹⁶ call for:

- increased funding for health research by the Department of Health, in line with the National Policy for Health Research of 2011 and the Mexico and Bamako declarations, from 0.37% to achieve the 2.0% of the national health budget;
- the training of a new generation of health researchers, especially black people and women, (through a National Health Scholars Programme);
- the development of health research infrastructure in the academic health complexes that will facilitate research-based re-engineering of primary health care (through the funding of clinical research centres);
- the funding of priority research projects designed to increase the lifespan of South Africans (through a national priority research projects fund);
- the improvement of the national regulatory framework for health research (through the new South African Health Products Regulatory Authority);
- the creation of a national mechanism for planning and timely translation of research findings into policy, programmes and practice (through a structure similar to the NICE in the UK); and
- the development of a national system for evidence-informed monitoring and evaluation of the effectiveness and impact of the health research system on the burden of disease in SA (possibly through the National Survey of R&D of the Department of Science and Technology).

Future editions of the Review will track the progress made in implementing these recommendations.

Conclusion

A new consensus is emerging on the fundamental importance of a national health research system in achieving a long and healthy life for all South Africans.⁴⁴ The alignment between the 10 Point Plan, the scientific advice of expert committees and the health research community in general has resulted in a rapid uptake of recommendations to revitalise the health research system in SA.⁴⁵ The *South African Journal of Science* has commented that:

[t]he present case is an example of how government policymaking can be productively influenced, by an expert committee (in this case the National Health Research Committee) acting on recommendations which were made by a panel appointed and managed by an independent national science academy (ASSAf) and debated by a cross section of stakeholders in the community. This process could be widely applied to the benefit of our society.⁴⁵

If the recommendations of the National Health Research Summit of 2011 to strengthen the national health research system were implemented (Table 4), SA might be on a 'high road' to success in health research over the coming decades.

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Health Policy and Systems Research: Needs, challenges and opportunities in South Africa – a university perspective

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The last two decades have seen growing international recognition of the need to strengthen health systems in order to deliver already available, cost-effective health interventions. This chapter describes the parallel global growth of the field of Health Policy and Systems Research (HPSR) and outlines what this field of research is and what it is not. The chapter also clarifies how HPSR can contribute to strengthening health systems. The particular relevance of HPSR in SA is discussed, given the range of health system transformation initiatives in place. Drawing both on an HPSR capacity assessment conducted in three universities and discussions with a wider group of researchers and health system managers, the chapter also considers the existing assets for and challenges facing the development of the field in South Africa. It closes with suggested strategies and priorities for developing and building capacity in this field nationally.

How can HPSR contribute to strengthening health systems given the range of transformation initiatives currently in place?

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Introduction

In November 2012, approximately 1 600 researchers, managers, and health activists met in Beijing for the second Global Symposium on Health Systems Research. The symposium saw the launch of two landmark activities for this burgeoning community: 'Changing Mindsets', the World Health Organization (WHO) strategy on Health Policy and Systems Research,¹ and the community's new society – Health Systems Global.

These events represent the most recent milestones in the formal development of the field of Health Policy and Systems Research (HPSR), which has slowly emerged since the late 1980s. As Box 1 outlines, critical events include the establishment of the Alliance for Health Policy and Systems Research, the WHO World Health Report of 2000, two Ministerial summits and their related resolutions (2004, Mexico and 2008, Bamako)²⁻⁴ and the first Global Symposium on Health Systems Research, held in 2010 in Montreux, Switzerland.

Box 1: Milestones in the development of HPSR

1990:	Commission on Health Research for Development
1996:	Ad Hoc Committee on Health Research relating to Future Intervention Options
1999:	Establishment of the Alliance for Health Policy and Systems Research
2000:	WHO World Health Report – Health Systems: Improving Performance
2004:	WHO Task Force on Health Systems Research Priorities for Equity in Health
2004:	WHO Report on Knowledge for Better Health
2004:	Mexico Ministerial Summit on Health Research and Statement on Health Research
2005:	World Health Assembly Resolution A58/22, related to Mexico statement
2008:	High-level Task Force on Scaling up Research and Learning for Health Systems, Global Ministerial Forum on Health Research and the Bamako Call to Action for Research for Health
2009-10:	WHO Strategy on Research for Health
2010:	First Global Symposium on Health Systems Research in Montreux, Switzerland
2012:	WHO Strategy for Health Policy and Systems Research, and Second Global Symposium on Health Systems Research in Beijing, China

Source: Adopted from Hoffman et al., 2012.⁵

Internationally, the importance of this form of research and analysis is based on the dual recognition, first, that stronger health systems are needed to deliver already available and cost-effective healthcare interventions, and so generate health improvement; and, second, that HPSR generates the evidence needed to support interventions to strengthen health systems. The importance of strong health systems has been specifically demonstrated by the challenges of scaling up efforts to tackle HIV, tuberculosis (TB) and malaria, and by the slow progress towards the attainment of the Millennium Development Goals in many settings. In 2007, the Director-General of the WHO, Margaret Chan, noted that weak health systems arise partly from a lack of investment but also from the fact that research on health systems has been so badly neglected and underfunded. The two go together... In the absence of sound evidence, we will have no good way to compel efficient investments in health systems.⁵

HPSR starts, therefore, with concern for the health system, the platform from which health services are delivered, and how that system can be strengthened. (See Box 2) It includes concern for how to promote the intersectoral action needed to address the social determinants of health.⁶ Several health system conceptual frameworks provide guidance for such research, as well as for action to strengthen health systems. All emphasise the ways in which different system dimensions or elements interact in generating system outcomes. The WHO framework, for example, specifically highlights six building blocks and stresses that:

[a] health system, like any other system, is a set of inter-connected parts that must function together to be effective. Changes in one area have repercussions for elsewhere. Improvements in one area cannot be achieved without contributions from others. Interaction between building blocks is essential for achieving better health outcomes.¹⁰

Therefore, while the longer-established field of health services research tends to focus primarily on service delivery issues, HPSR has a strong focus on the system elements that underpin service delivery (such as financing or human resource issues) and requires that all elements, including service delivery, are considered in relation to their place within and their contribution to the whole system. A 2012 paper on access to medicines provides a good example of this approach.¹¹ HPSR also, for example, encourages consideration of how a specific service (e.g. provision of antiretroviral therapy) influences the system as a whole, or how system interventions, such as management strengthening, influence particular services.

Box 2: HPSR – definition and basic questions

HPSR “seeks to understand and improve how societies organize themselves in achieving collective health goals, and how different actors interact in the policy and implementation processes to contribute to policy outcomes. By nature it is interdisciplinary, a blend of economics, sociology, anthropology, political science, public health and epidemiology that together draw a comprehensive picture of how health systems respond and adapt to health policies, and how health policies can shape – and be shaped by – health systems and the broader determinants of health”.¹²

Its key questions are:

- ❖ What are health systems, how do they currently function and why do they function like that?
- ❖ What needs to be done to strengthen them?
- ❖ How can policy agendas on health system development be influenced?
- ❖ How can policies be developed and implemented in ways that strengthen health systems?

Source: Gilson, 2012.¹²

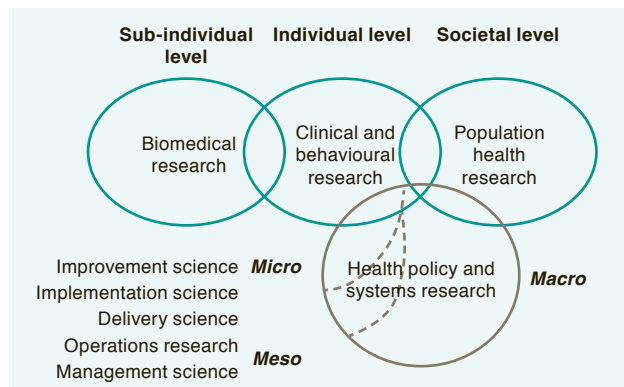
Given the whole system focus of HPSR, there is growing discussion of the value of ‘systems thinking’ approaches drawn from complexity science in understanding and supporting action to strengthen the health system.^{13,14} As Box 2 indicates, HPSR also seeks specifically to understand the processes of policy change. Using policy analysis perspectives, it gives specific attention to policy actors and their interests and values as forces that shape not only which ideas become priorities within policy agendas but also the practice of policy and programme implementation.¹⁵ Both systems thinking and policy analysis emphasise the central place of people within health systems, as patients, providers, managers, decision makers,

as individuals and as groups whose values, norms, cultures and identities represent a key facet of every health system. In this way people act to filter, translate and re-shape the system constantly. Drawing on a range of social science theory, they understand health policies and systems to be “artifacts of human creation, embedded in social and political reality and shaped by particular, culturally determined ways of framing problems and solutions”.⁸

Four defining features of HPSR, thus, explain its position relative to the broader field of health research and to the growing body of instrumental ‘implementation science’ (Figure 1). These are:

- the types of questions it asks (Box 2), which may entail research across individual (micro), organisational (meso) and/or whole system (macro) levels;
- its focus on supporting action for health system development and policy implementation, whilst acknowledging that such action is always influenced by political and social forces, rather than primarily technical, and is itself an important focus of research;
- its multi-disciplinary base, which encompasses both social science perspectives and the more traditional health research bases of biomedical, clinical and population health sciences; and
- its acceptance of a range of quantitative and qualitative data collection and analysis methods as all equally valid, when rigorously applied and appropriate to the question of focus.

Figure 1: The place of HPSR in the broader terrain of health research



Source: Adapted from Hoffman et al., 2012.⁵

But what is the relevance of HPSR to South Africa (SA)? What HPSR assets do we have, and what key challenges confront the field’s development in the country?

The remainder of the chapter addresses these questions, drawing partially on work conducted for the Consortium on Health Policy and Systems Analysis in Africa (CHEPSAA), as well as the discussions of a special pre-conference workshop on HPSR organised at the 2012 South African Public Health Association (PHASA) Conference.

What is the relevance of HPSR to South Africa?

The major current South African health system reform initiatives, both National Health Insurance (NHI) and re-engineering primary health care, as well as other health system strengthening efforts, all address output four of the Negotiated Service Delivery Agreement (NSDA), which seeks to strengthen health system effectiveness. The 10-Point Plan of the National Health Sector Strategic Framework 2010-13 also specifically recognises the need “to generate information for health planning, service delivery and monitoring”¹⁶ and the related research priorities identified in the 2011 National Health Research Summit report are very wide ranging.¹⁷ They include, for example, epidemiological and clinical effectiveness data, assessment of maternal health service quality and economic evaluation studies – and:

- better understanding of why existing health policies are not being implemented effectively;
- consideration of how to replicate pockets of health system excellence more widely and of how to improve operational efficiency;
- monitoring whether reforms are generating gains in terms of improved equity of access to health systems; and
- reflection on how to translate evidence into policy and practice.

All the bulleted priority issues fall clearly within the particular terrain of HPSR, as outlined earlier. As noted by Margaret Chan, the Director-General of WHO, – action to improve health system effectiveness demands the sort of research that can guide and evaluate the necessary health system investments.

What are the HPSR assets of South Africa?

SA is fortunate to have a rich variety of groups working in HPSR. They include the university-based schools of public health as well as other university groups: for example, the Community Health Division, University of Stellenbosch, has recently developed a focus on Health Systems and Services Research (HSSR), and the University of KwaZulu-Natal houses both the Centre for Rural Health and the Health Economics and HIV/AIDS Research Division (HEARD), while the University of the Free State is home to the Centre for Health Systems Research. Outside the university environment, meanwhile, two other key groups are the Health Systems Trust (HST) and the intra-mural Health Systems Research Unit of the Medical Research Council (MRC). Although more commonly focused on programmatic research questions, other health researchers, such as those working on specific issues such as TB or HIV or reproductive health, also sometimes get drawn to HPSR issues. Finally, some specific HPSR projects have been conducted by groups outside the health sector, such as by the Society Work and Development Institute at the University of the Witwatersrand.¹⁸

To illuminate the situation and work of South African HPSR groups, more details are provided about three groups whose work falls in the HPSR terrain. While these three groups are not the only university-based units working in this area, as part of CHEPSAA 2011 they conducted a capacity assessment of themselves and the broader environment. Some of the findings of this assessment are presented below as a case study.

Case study

Brief overview of three CHEPSAA-affiliated HPSR groups

The School of Public Health, University of the Western Cape (SOPH UWC) falls within the Faculty of Health Sciences and was established in 1993 with the purpose of supporting the building of a district health system under the country's new democratic dispensation. The SOPH has had a strong health systems focus and currently incorporates three main research areas – social determinants and social systems, health programmes and interventions, and health systems. Its health system work focuses in particular on health information systems, human resources, and health programme strengthening but also, increasingly, on a better understanding of whole systems functioning. It has recently been successfully awarded a National Research Foundation (NRF) South African Research Chairs Initiative (SARChI) research chair in *Health Systems, Complexity and Social Change*, which it has now filled.

The Centre for Health Policy (CHP), a research group within the School of Public Health, University of the Witwatersrand, was established in 1987 to support the development of health policy for a post-apartheid South Africa. Its mission as an independent, multi-disciplinary research organisation is to contribute to excellence in health policy and systems research and to be a critical participant in health policy processes. Its primary areas of current focus are health policy analysis, access to health care, health equity and financing, human resources for health and maternal health and health systems. CHP has recently successfully been awarded an NRF SARChI research chair in *Health Policy and Systems Research* which it intends to fill in 2013.

The Health Policy and Systems Programme (HPSP) and Health Economics Unit (HEU) of the School of Public Health and Family Medicine (SOPH&FM), University of Cape Town (UCT) – while the HPSP is a very new grouping, established only in 2008 to deepen UCT's work in understanding health policy change and whole system functioning, the HEU was founded in 1990. Together the groups conduct work focused on governance and decision making, healthcare financing, health system equity, access to care, and the economic evaluation of interventions for diseases of public health concern. The HEU is home to the NRF-funded SARChI research chair in *Health and Wealth*, which focuses on healthcare financing reforms to move towards universal coverage and on the social determinants of health in South Africa.

To situate these groups against international experience, Table 1 below presents some organisational profile indicators. It shows that the groups are perhaps a little smaller in size than groups elsewhere but that they have average to relatively good levels of expertise compared to other groups (considering the director's experience, and the proportion of staff with doctorate degrees). All groups have relatively few senior staff and limited administrative support, although CHP and HEU employ dedicated Communications Officers. Finally, the mean value of HPS grants these groups held at the end of 2011 was roughly comparable with one another (although UWC had a higher total number and value of grants), but appeared to be above that of the average for middle-income countries (MIC) (although all figures are quite crudely estimated).

Table 1: Organisational Profiles of the three CHEPSAA affiliated groups

	CHP, Wits	HPSP/HEU, UCT	SOPH, UWC (doing HPSR work)	2010 MIC (64 groups surveyed)
Staff profile 2012				
Director has more than 10 years' experience	Yes	Yes	Yes	51% of groups surveyed
Number of academic staff	16	12	13	18 (group mean)
Number of staff with Doctorates	5/16 (31%)	9/12 (75%)	4/13 (30%)	36% (group mean)
Number of senior academic staff (Associate Professor, Professor)	2/16	3/12	4/13	n/a
Number of administrative staff	5 including 1 part-time Communications Officer	5 including 1 full-time Communications Officer	14 for SOPH as a whole, not exclusive to HPSR	n/a
Grant funding (end 2011)				
Number of active HPS grants held	12	10	16	n/a
Total value of grants held	R31.2 million	R34.13 million	R39.6 million	n/a
Mean grant value (2011)	R2.4 million (approx. \$300 000)	R3.41 million (approx. \$426 250)	R2.47 million (approx. \$308 750)	\$137 135 (approx. R1 mill) (2010) (across total of 94 grants)
Number of grant-funded academic posts	15/16	9/12	6/13	n/a
Grant funding sources*				
International bilateral or multilateral	9 (75%)	6 (60%)	8 (50%)	66%
Government	3	2	2	22%
Private/Other (international and national)	1	3	6	16%

* One grant could be funded by more than one source.

The grants held by the South African groups support a range of research and capacity development activities and are mostly funded by international agencies, although the South African Government does commission some of this work. Commissioned projects and operational research activities generally have shorter time frames than other projects (12 months or less) and address fairly tightly defined problems or questions. Independently initiated research, in contrast, is of longer duration (two to four years) and tackles broader sets of issues. Given the demands of such work relative to staff available, it is often conducted collaboratively among these groups or, given funding modalities, as part of multi-country projects.

The research activities supported by these grants address a fairly broad set of South African policy and systems issues and lie across the spectrum of HPSR research approaches. The table below shows the range of HPSR research activities that have been undertaken and that typically fall under the rubric of HPSR.

Examples of HPSR activities conducted in SA

Type of activity	Examples
Operational research	<ul style="list-style-type: none"> Assessment and intervention to address waiting times and patient flows in health facilities
Commissioned technical assistance	<ul style="list-style-type: none"> Costing the scaling-up of antiretroviral treatment in 2007 and 2011 Developing the 2011 outline of a primary healthcare package Supporting the development of the Office of Health Standards Compliance Developing a community-based services policy framework for the Western Cape
Analytical studies	<ul style="list-style-type: none"> The distribution of benefits and financing burdens across population groups and in terms of access to care
In-depth research	<ul style="list-style-type: none"> Investigating the state of nursing policies, practice and management
Collaborative, qualitative	<ul style="list-style-type: none"> Work conducted with health managers to understand the dynamics of sub-district governance and support action to strengthen management processes at this level
Tracking and supporting health system reform	<ul style="list-style-type: none"> Work that seeks to track and support the implementation of the current South African efforts to promote universal coverage, through close engagement with national and district managers

As HPSR projects, these activities all adopt a system rather than service or programme focus, and commonly use social science perspectives in their work.²⁰⁻²³ All research projects are also generally undertaken in collaboration with South African public health system managers and policy makers, although the extent and nature of this collaboration vary. Beyond research projects, meanwhile, staff from the three groups are also engaged in providing policy and managerial support to government colleagues in various ways. An independent evaluation of HEU, for example, noted "government respondents in SA cite multiple ways in which HEU has contributed to policy; areas frequently cited included health equity, health financing, drug policy, primary health care and district health systems".²⁴

Finally, and unlike HPSR groups based outside universities, the three groups are all involved in formal post-graduate education programmes, training future generations of health system managers, analysts and researchers. These activities range from the UWC SOPH Winter and Summer School programmes, which have been attended by over 12 000 mostly South African students since 1992, to UCT's post-graduate Diploma in Health Management (the Oliver Tambo Fellowship programme), which now has over 250 alumni mostly working in the South African public health system, to the three universities' Masters of Public Health (MPH) programmes (including, at UCT, a specialist health economics programme), and growing numbers of HPSR doctorate degrees. The groups also support the more informal apprenticeship of younger staff members by creating spaces for learning within their routine activities. In the past, CHP and HEU both offered formal internship programmes but more recently there has been a strong focus in all groups on supporting younger staff to complete doctorates.

Although training and apprenticeship are offered to individuals, they can be seen as a health system intervention as over time the number of people reached in these ways is considerable. The research projects of masters and doctorate students, for example, represent a potentially important, but currently largely untapped, body of evidence for health system development. Training, meanwhile, shapes the way people understand health policy and systems issues and challenges and how to go about addressing them, as well as supporting skills development for managers, researchers, and health advocates.

Finally, the formal training programmes also play a regional capacity-development role. In 2010, for example, around 70% of UWC's MPH students were, for example, from the region and it is currently supporting a master's programme in health workforce development for the WHO AFRO region. UCT's MPH health economics, meanwhile, is one of only two health economics master's courses on the continent and is highly regarded by its graduates.²⁵

What challenges face the further development of HPSR in South Africa?

Despite the strong foundations that exist, participants in the 2012 PHASA pre-conference HPSR workshop^a agreed that a range of challenges, at individual, organisational and system level, face the further development of South African HPSR work.

Individual level

A key challenge for the individuals involved in HPSR is that this work requires multiple perspectives. On the one hand, it is important to have some understanding of how health programmes, facilities and systems work in practice and of their challenges. On the other hand, an appreciation of the contribution of different social science disciplines to HPSR inquiry as well as a broader population health perspective is useful, as is a recognition of and sensitivity to the differing value of quantitative and qualitative methodological approaches to data collection and analysis. This breadth of perspectives requires, in turn, the confidence and ability to engage with people who sometimes have quite different experiences. Those working in HPSR have to be what are called “boundary spanners” – working across the boundaries of experience and approaches to knowledge and across sets of people and organisational environments.

However, students and young academics generally come to this field either primarily with health service experience and a very limited familiarity with social science perspectives, or with more of a social science base and a limited understanding of health programmes, services and systems. In either case, they need time and opportunity to broaden their horizons, with the best learning coming through active engagement and dialogue. It is also important to be able both to conduct analytical and research work and to make public presentations and write clearly, and for different audiences. Those working in academic environments must, in addition, be able to teach and facilitate, and to develop, run and manage courses and programmes intended to provide learning opportunities for others. Not surprisingly, therefore, younger staff working in the CHEPSAA-affiliated groups identified a range of current knowledge and skills gaps. These included conceptual limitations in relation to HPSR, needs in writing and presentation skills, a range of teaching and supervision skills, inter-personal confidence and skills for networking and mentoring, and research management competencies (such as grant writing and project and financial management).

Organisational level

Simply attracting younger academics into the field of HPSR and retaining them within the groups represents a first, key organisational challenge. Although public health and public policy, for example, are elements of other courses, HPSR is not itself taught at undergraduate level and so it is not widely known as a potential career option. Those who come to the field with some experience, meanwhile, can find the challenge of developing new skills and competencies tiresome, and may have unrealistic expectations of salary or career possibilities (particularly in academic organisations).

^a This workshop was attended by around 30 participants drawn from government, universities and other research groups and sought to discuss both current South African HPSR work and future possibilities for strengthening it.

As Table 1 highlights, a sizeable proportion of posts in all three South African HPSR groups is grant funded. Not surprisingly, the relatively short-term and time-bound nature of such funding can generate contract instability. At an individual level, this makes planning the sort of long-term apprenticeship needed to develop HPSR capabilities very difficult; at an organisational level it can result in personnel turnover and instability. The pressure on senior staff in such groups is particularly intense. Beyond their own research, teaching activities and policy support work are the tasks of mentoring and coaching younger colleagues in their HPSR apprenticeship periods, as well as research, grant and teaching administration, including fund raising. Finally, as senior staff, they must also respond to broader organisational needs. Succession planning can be a real challenge in these situations.

The constant need of most groups to source and renew grants and to fulfil the very different, and sometimes demanding, reporting needs of different funders is a particular organisational demand. To support these activities, and lessen the burden on senior staff, some units have resorted to hiring extra staff to manage various operational and project management processes. However, such positions only add to the funding challenges, given limits on the level of overhead costs that can be included within research or other grants. A further funding issue is that some units do not hold any or many university-funded teaching posts, and so effectively cross-subsidise much of their teaching time from research grants (i.e. by allowing staff funded through research grants to spend some time teaching).

A final factor that commonly underpins resourcing challenges is the limited extent of organisational understanding and appreciation of HPSR. While all three CHEPSAA-affiliated HPSR groups are located within supportive schools of public health, for two, the broader environment remains primarily driven by the imperatives of clinical service provision and undergraduate health professional training. The multi-disciplinary knowledge base and trans-disciplinary approach of HPSR are just not always well understood or accepted by the biomedical paradigms of knowledge that dominate health research in the country.

System level

As already noted, HPSR can play an important role in supporting current South African health system reform efforts. Indeed, health systems research has been established as a South African priority since the Essential National Health Research Strategy of 2001. Yet various system-level challenges remain to the consolidation and development of such work in South Africa.

There are, for example, practical disjunctures. While policy makers seek fairly quick inputs to immediate needs, HPSR groups may find it difficult to respond quickly. Given their grant-funded basis, they have to take on projects to fund their staff and so are bound to particular activities and timeframes. As a senior researcher in one of the units noted:

I think the critical question for units like ours is how you find the balance between responding to the immediate short-term needs of politicians and civil servants versus some of the longer term issues.

University-based groups’ particular commitment to capacity development also brings the need to respect teaching timetables

and respond to student needs. They often simply do not have the spare person power or flexibility in person use to take on commissioned work or to respond to calls for advice and assistance from government colleagues.

There is also some scepticism about 'the other group' on both sides. Although some individual researchers are held in high esteem by those in the policy world, there seems to be a broader suspicion among policy practitioners and managers about researchers. This seems to combine a sense that those working in HPSR, in particular, are not sufficiently engaged with real world experience, and a concern that all academics think first of publications for their own benefit and only second about engaging with health service needs or reporting back. Certainly, researchers do not always have appreciation of the daily realities of health service provision or the urgency and pressures of policy making. Their reliance on international funding (see Table 1) may also divert them from domestic research priorities, including engagement with health system practice. But, from the researchers' perspective, governmental research leadership is not very strong and the pressures of health management make it difficult for government colleagues to engage with researchers or draw the available research into decision making. As a provincial government respondent noted:

I don't really feel there's anyone in the department that offers research leadership and if my unit is seen to be obstructive and bureaucratic and irritating, why would you even want to have a relationship within a unit like that? I think we haven't helped. I think we have the image of being the typical bureaucratic slow inefficient unit.

For HPSR, research scepticism also seems to be linked to conceptual disconnects. In the wider health community the dominant clinical, biomedical, and epidemiological health service¹² perspectives tend to focus on service rather than system issues, and particular forms of research. The issues identified as health systems research priorities at the 2011 National Health Research Summit,¹⁷ for example, tend to focus on specific service delivery issues, rather than the widely acknowledged system challenges of, say, health worker motivation, priority setting and planning or management. It appears these wider issues are somehow not seen to be researchable questions, or that the related research approaches are not well understood or appreciated. Indeed, in drawing on social science perspectives, HPSR may challenge the understandings of the world and of research that underpin the dominant perspectives of health and health research in South Africa.

These types of disjunctures are, in turn, underlain, first, by the quite limited regular engagement among those with shared concern for health system development, who both do and could use HPSR – whether based in universities, NGOs, or government. There are few opportunities simply to pool different types of knowledge and experience of existing challenges and possible approaches to tackling them, and so to develop shared, and richer, understandings of research priorities and relevant research approaches. Competition for funding and multiple workplace demands seem sometimes even to limit engagement among the research community. Yet such engagement is really critical because of the complexity of health systems and their development – no group has a monopoly on good insights and ideas; indeed, if the challenges were simple, they would have already been addressed. Provinces are responding to this challenge differently.

The second underlying problem is the lack of deliberate national action to develop this area of work. There has been, for example, no large-scale domestic scholarship support for post-graduate training in the field, at either master's or PhD level. Until recently, few South Africans applied for the HEU Health Economics MPH, for example, and most of the three CHEPSAA-associated groups' South African doctorate candidates are its own staff. At the same time, there are very few established positions within government for those with health system analytic skills – such as health economists, policy analysts, or process analysts. As one university respondent stated:

if you are someone who comes out with a degree there is nowhere for you to go to deploy your skills; you either do something else or you go to the private sector or you go to stay in the university.

Yet much of the analytic work that is currently commissioned and demanded by government would probably be better done in-house. There is a clear need for analysts working within government who have the range of skills necessary to support the translation of available evidence and research into decision making, as well as to commission research that cannot be done in house.

Funding remains the final challenge. The 2011 National Health Research Summit report notes that in 2011/12 the Department of Health invested only 0.37% of its budget in all forms of health research,¹⁷ falling well short of its commitment to meet the 2% of budget target set in the Mexico and Bamako ministerial meetings. Whilst it is not known what proportion of the national health research budget is directed specifically to HPSR, it can be estimated as very little. Only HST has any form of structured and limited funded relationship for research with government, and the MRC also allocates relatively little of its total budget to HPSR. In contrast, however, the NRF has made a significant contribution in approving three HPSR chairs within the SARCHI. This funding has the added value of being linked to broad programmes of work, rather than very tightly defined projects over five-year periods and includes some scholarship funding at master's, doctoral and post-doctoral levels.

Strengthening the capacity to generate and use evidence for health system development

As SA looks to the future – and pursues its goal of health system transformation, it is essential that it also takes action to develop the engine room of transformation – i.e. the knowledge and evidence base to support change, and the capacity to draw it into decision making. HPSR is vital to that effort as it addresses the systemic challenges that must be tackled to improve service delivery, support implementation of public health priority programmes, and so contribute to improved population health. The 2012 WHO HPSR strategy¹ affirms that: "At its best, HPSR should function as the GPS of health decision-making, providing navigational support to the decision-maker, locating the starting point for the journey (the health problem), the desired destination (the health outcome) and options for getting there (health solutions)."

This strategy, and the wider literature, also confirms that the South African challenges to HPSR development are not unusual. However, the examples of middle-income countries that have successfully implemented large-scale health system transformation offer lessons from which SA can learn. Drawing on such experiences, the WHO

calls for “HPSR to become embedded in the ecosystem in which the decision makers operate”¹ and identifies six broad areas of action (Box 3). Both researchers and decision makers must take action. Demand-driven research, for example, requires the transparent and collaborative identification of research priorities and decision makers who support evaluation of large-scale reforms and who are personally ready to use evidence in their decision making.

Box 3: WHO HPSR strategy actions

- 1 Embed research within decision-making processes
- 2 Support demand-driven research
- 3 Strengthen capacity for research and use of evidence
- 4 Establish repositories of knowledge
- 5 Improve the efficiency of investments in research
- 6 Increase accountability for actions

The lessons of experience suggest that a key step towards embedding HPSR in decision making is greater and more regular engagement among decision makers and researchers. It was timely, therefore, that the 2012 PHASA pre-conference workshop discussed the value of establishing a national network or community of practice for HPSR in South Africa. Bringing together researchers inside and outside government, with practitioners in all spheres of government and in NGOs, such a network would give the field a stronger voice and a credible presence.

Concretely, participants felt that such a network could:

- > develop a common language for the field;
- > synthesise experiences and research results;
- > develop joint research agendas, and so avoid duplication; and
- > better respond to government needs.

Its value would, however, lie very strongly in building relationships among interested groups – allowing different forms of experience and knowledge to be shared (from the tacit knowledge of managers and advocates to the theoretical knowledge and awareness of wider experience of researchers); generating more rounded and in-depth understanding of current challenges and opportunities for health system development; and allowing a greater appreciation of the range of research available and of the value of different types of evidence.

Greater recognition of HPSR could also be a key first step towards securing more funding for it. The importance of funding to sustaining HPSR worldwide led the WHO to identify three areas of action by funding bodies:¹

- > “Minimum targets for HPSR funding, as a proportion of all health research funding, could be established by donors and governments in order to ensure sufficient resources for the conduct of research.
- > Allocate resources for HPSR as part of programme activities (planning, implementation, and evaluation) ... to ensure adequate funding for relevant research to inform these processes.
- > To facilitate the generation of evidence that responds to complex health system challenges that can only be understood over an extended period of time, efforts should be made to establish flexible funding mechanisms that are not restricted

to individual projects. Institutional endowments and/or cooperative agreements could be used by funders of research to support a range of trans-disciplinary research activities to address multi-faceted health system problems.”

In South Africa, the funding needs are not only for research but also, critically, for capacity development. Those engaged in teaching and capacity development must, therefore, be fully funded for their capacity-development roles. However, the restriction of the recently announced health scholars programme to health professionals eligible to register with health statutory councils only demonstrates the current system-bias against the broader perspectives of HPSR.

Beyond funding, moreover, SA must also consider how to attract a wider range of, and younger, people into HPSR – to work as researchers, analysts and managers and to sustain capacity development efforts. The necessary actions include efforts to develop the skills, knowledge and networks that enable boundary spanning, with clear training and apprenticeship opportunities. Supportive environments are also important – including retention incentives and career trajectories within the field that span organisational boundaries. Government posts must be established for those doing HPSR and more secure funding must be found for those groups working outside government. An HPSR community of practice could also both itself help to give value to this area of work, and develop practical recommendations on this range of issues.

Looking to the future, Box 4, finally, outlines the priority HPSR issues and methodological needs that the budding South African HPSR community itself identified at the PHASA pre-conference workshop.

Box 4: South African priorities for HPSR development

- ❖ Substantially more research with a systems rather than an intervention focus should be carried out.
- ❖ In relation to the NHI there is a great need to understand what the policy will mean and how it will impact on and reshape health systems functioning. There is also a need to track and monitor implementation and to learn from implementation continuously.
- ❖ More research needs to focus on the meso- and micro levels of systems’ development, rather than primarily the macro level.
- ❖ There is a need for research that investigates why implementation fails, what guides implementation at the level of service delivery, and that understands the role of power and politics in the development of health systems. Research should also investigate the role of actors and what guides people’s action. The factors that influence what people do are very important questions in this regard.
- ❖ We need to develop methods and approaches that recognise and provide insight into the complexity of health systems functioning, understanding that such research often takes time and defies single tools and quick solutions.
- ❖ There is a need for collaborative research approaches and initiatives, strengthening the applied research skills of all involved. This includes action-oriented research that covers the continuum from policy formulation to implementation. And it includes attention to user-friendly, participatory approaches that strengthen the researcher-practitioner link: researchers need to be informed by implementers’ needs and implementers need to see research results.
- ❖ We need to synthesise and share what we are learning across projects. At present there is too much fragmentation and research is disparate and uncoordinated. There is a need to create fora for such sharing and engagement across projects, institutions and research approaches.

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Crises, Routines and Innovations: The complexities and possibilities of sub-district management

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Districts and sub-districts are crucial to the functioning of the district health system and the successful implementation of health sector reforms, which have been at the centre of public debate in the past few years. While policy intentions and service challenges are much debated, little systematic discussion is held about the internal operations and functioning of sub-districts and districts. These dynamics will strongly influence the implementation of the reforms proposed.

This chapter discusses the complexities and challenges of managing a sub-district, using as a case study the Cape Town sub-district of Mitchell's Plain. Drawing on debates in systems thinking and management theory the role of districts and sub-districts at the interface between strategic policy direction and operational service implementation is discussed. The chapter uses experience from an action learning project in Mitchell's Plain to present examples of innovation aimed at strengthening leadership and routine management functions. We argue that routine management in an environment of stress, constraints and uncertainty requires that managers be resilient, reflective, and continuously able to learn, analyse and adapt. Management and leadership development programmes should focus on developing these capabilities (within and beyond the classroom), in addition to developing technical skills and capacities.

Routine management in an environment of stress, constraints and uncertainty requires that managers be resilient, reflective, and continuously able to learn, analyse and adapt. These are the characteristics of good leaders.

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Introduction

The district is the cornerstone of South Africa's health system. Since 1995 a series of policies and interventions have contributed to shaping the South African District Health System (DHS) in its present form. These policies and interventions have ranged from establishing district boundaries to clarifying the relative roles of provincial and local government in delegating authority and drawing up district health planning processes.¹⁻⁴ The 2011 proposals for both Primary Health Care (PHC) re-engineering⁵ and National Health Insurance (NHI)⁶ reaffirm the foundational role of the DHS within the health system and as the vehicle through which PHC will be delivered. A core objective of the NHI pilot sites is the development of innovative ideas about how to strengthen the DHS.

Alongside structural and organisational innovations and interventions have been discussions and concerns about standards and the performance of the DHS. Politicians, officials, media and researchers have frequently pointed to uneven and often poor access to and quality of health services throughout the country. The Health Systems Trust's annual *District Health Barometer* provides publicly available data on key indicators of structure and performance across all health districts in the country, which reflect vast unevenness in performance. One of government's responses to its growing concern with quality and performance has been the move towards the establishment of an Office of Health Standards Compliance which will audit standards of care, from patient rights to infrastructure and clinical support in health facilities.

But while poor quality and inequitable access to health services are acknowledged, in contrast, little information is formally available about the dynamics, opportunities and challenges of routine operations in a South African health district (although the 2001 *South African Health Review* did air the voices of district managers).⁷ Yet change in the organisational culture of the South African health system is recognised as a key requirement for implementing current policy priorities and improving performance and quality of care.^{8,9}

Understanding health system capacity and complexity

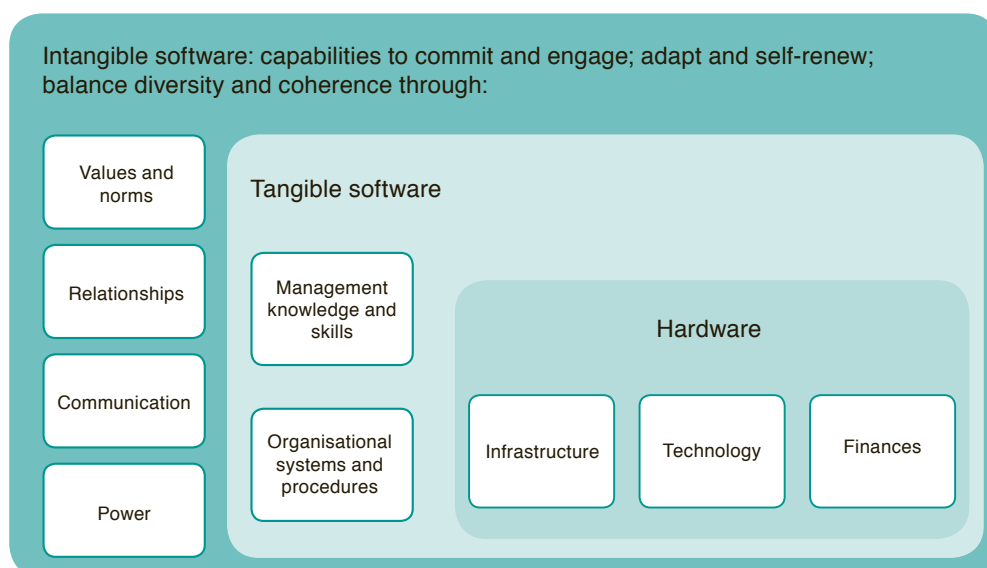
Literature from outside the health sector also highlights the importance of daily practices and routines to an organisation's collective capacity; i.e.:

that combination of attributes that enables a system to perform, deliver value, establish relationships and to renew itself ... the abilities that allow systems – individuals, groups, organisations, groups of organisations – to be able to do something with some sort of intention and with some sort of effectiveness and at some sort of scale over time.¹⁰

As summarised in Figure 1, organisational capacity rests on three interacting dimensions: the hardware of infrastructure, technology and funding levels; the tangible software of knowledge, skills and processes of decision making; and the intangible software of relationships, communication practices, values and norms. The intangible features are particularly important in shaping the behaviours of those working in the organisation and underpin its "power to perform". Organisational practices and routines are located in the software dimensions, but are shaped by the organisational hardware.

In the health literature the particular importance of the intangible capabilities of systems (and the time and patience it takes to build strong and resilient systems) has been highlighted in the 2011 publication *Good Health at Low Cost – 25 years on*.¹² This publication reports on an assessment of the health systems of five countries (Bangladesh, Ethiopia, Kyrgyzstan, Tamil Nadu (India), Thailand) that have achieved better health outcomes than neighbouring countries with similar incomes. Beyond policy actions around human resources, healthcare financing and drug supply, government leadership and vision and organisational software were found to be important in sustaining health system resilience to withstand shocks and secure good health at low cost.

Figure 1: Organisational capacity to function as a resilient, strategic and autonomous entity



Source: Adapted from Aragón, 2010.¹¹

Such shocks included the changing health demands associated with epidemiological and demographic transition, new drugs and technology, wider economic crisis – and the quite frequent waves of health reform initiatives in every setting.^{13,14} The key features of successful health systems identified in this study are summarised in Box 1 below.

Box 1: Key features of successful health systems

A health system has been found to be successful when it:

- ❖ has vision and long-term strategies;
- ❖ takes into account the constraints imposed by path dependency;
- ❖ builds consensus at societal level;
- ❖ allows flexibility and autonomy in decision making;
- ❖ is resilient and learns from experiences, which it feeds back into the policy cycle;
- ❖ receives support from the broader governance and socio-economic context in the country and is in harmony with cultural and popular preferences;
- ❖ achieves synergies among sectors and actors; and
- ❖ demonstrates openness to dialogue and collaboration between public and private sectors with effective government oversight.

Source: Balabanova et al., 2011.¹²

Worldwide, these and similar experiences are leading health system practitioners and scholars to look to complexity theory and systems-thinking approaches to aid their understanding of what health systems are, how they operate and how to strengthen them. Adams and de Savigny noted in 2012:

Health systems are complex. Failing to take this complexity into account will continue to hinder efforts to achieve better and more equitable health outcomes. Understanding and working with complexity requires ... dynamic and holistic approaches that appreciate the multifaceted and interconnected relationships among health system components, as well as the views, interest and power of its different actors and stakeholders.¹⁵

From this perspective health system strengthening is about building a learning culture and promoting collaboration across disciplines, sectors and organisations. Importantly, strengthening health systems involves developing leaders distributed across the system, who work to transform existing routines and practices.¹⁶

These understandings of collective capacity and systems suggest that strengthening the South African DHS requires better understanding of what a South African health district looks like from the inside – what the daily routines and challenges of district managers are and what opportunities they contain for strengthening the DHS software.

A case study in sub-district functioning and innovation

This chapter addresses these issues by presenting a case study of one urban sub-district as a stimulus for reflection elsewhere in the health system. Although not all provinces have yet established sub-districts, Naledi et. al.⁹ note the critical importance of stronger sub-district management in PHC strengthening. We also suggest that the experience presented here can stimulate debate about broader district functioning. Whilst the specifics of this sub-district will clearly be just that, specific to its context, many of its critical

features are likely to be more widely shared – importantly, the location of districts and sub-districts at the interface between strategic policy direction and operational service implementation. Early reviewers of this chapter, have confirmed that this particular experience is reflected in other areas of the country. Management commonly requires: working within multiple lines of authority and managing multiple demands and many sets of actors; seeking to lead and supporting others to lead; and challenging organisational cultures whilst being subject to continuing uncertainty and change in structural arrangements and delegations.

Some of the experiences from this case study indicate the possibility of innovating within this complexity, of initiating the processes of software change that are essential for implementing policy reforms and achieving service delivery improvements.^{9,17} We present them to encourage a wider sharing of experience about the processes of positive change that are already occurring, mostly unnoticed, within the South African health system. In addition, we argue that stimulating and generating positive organisational change is a key task of managers and leaders, which requires new understandings of the managerial/leadership role and new approaches to health system research. The case study reported on in this chapter, has been developed as part of a wider action learning project partnership between health services and academic groups – the DIALHS project^a – that seeks to understand and improve health system governance. Through collaborative action learning and reflective practice the case study draws on a combination of managerial tacit knowledge and scholarly understandings, brought together through a series of conversations and engagements among the authors.

This is a case study of the Mitchell's Plain sub-district in Cape Town. Health service delivery in Mitchell's Plain is under the dual authority of the Metro District Health System (MDHS) of the Western Cape Department of Health and the City of Cape Town (CoCT) health department.

Box 2 provides more details about the sub-district, which is a relatively low-income community (with 83 informal settlements). The community has a relatively poor health status and health problems that reflect the South African quadruple burden of disease. Although the Mitchell's Plain 2010/11 PHC utilisation rate was not as high as in other areas in Cape Town, the MDHS as a whole managed a ten-fold headcount increase between 1994/5 and 2011/12 – reflecting the combination of a growing population and disease burden, and improved access. Relative to population and headcount levels, Mitchell's Plain is under-resourced compared to other Cape Town sub-districts. Clinics in Mitchell's Plain on average each serve a population of over 64 000 (the target for urban areas is 24 000). Daily workload averages in 2010/11 were 40 patients per medical officer in Community Health Centres (CHCs) and 50 patients per professional nurse in clinics and CHCs. Despite the challenges, a range of service indicators point to a strong health service performance in the sub-district. It also has a TB cure rate of 88%, immunisation coverage of 93% and 56% of antenatal care (ANC) visits occur before 20 weeks.

^a The District Innovation and Action Learning for Health System Development (DIALHS) project is a partnership between the City of Cape Town and the Western Cape Department of Health and the Universities of Cape Town and the Western Cape funded by the Atlantic Philanthropies.

Box 2: Mitchell's Plain health system profile^b

Population: In 2010/11, the population was estimated at 510 267, 88% of which do not belong to a medical aid scheme.

Health status: Just over half (5.5%) of the children under-five present with failure to thrive. The infant mortality rate is 14 per 1 000 live births and there is a high incidence of diarrhoeal cases and other illnesses related to poverty. The tuberculosis (TB) incidence is 687 per 100 000 and the sub-district carries a quadruple burden of disease, with a co-infection rate of TB and HIV of 50% and non-communicable diseases, mental ill health and violence putting serious strain on services. Substance abuse affects most households.

Government health services

The following services are provided to the population by the government:

- ❖ community-based service platform managed through MDHS and environmental health services managed through CoCT;
- ❖ nine CoCT clinics staffed by nurses;
- ❖ four CHCs (3 MDHS, 1 CoCT), with medical and nursing staff; 1 offering 24-hour services, 3 offering 8-hour services; and
- ❖ one Level 1 hospital with 188 beds, which is currently being decommissioned. A new Level 1 hospital with a future capacity of 220 beds is under construction, to be opened in 2013.

Financing 2011/2012:^c

- ❖ R358 per uninsured head (district average of R533; national average of R514)
- ❖ An average of R141.40 is spent on each PHC visit; the district average is R147.40, while the national average is R176.

Government health service performance indicators:

- ❖ The total headcount for PHC facilities was 9.9 million in 2010/11
- ❖ The 2010/11 PHC utilisation rate stood at 2.85 per uninsured head (district average of 3.7; national average of 2.3)
- ❖ In 2011/12 88% facilities were supervised monthly (district average 56%; national average of 68.8% in 2010/11)

Source: Day et al. 2011.¹⁸ Western Cape Department of Health, 2011.¹⁹

The complexity of the sub-district health system

Figure 2 shows the organisational complexity of the sub-district and how it is situated within municipal and provincial district structures. As Mitchell's Plain is located in a metropolitan area, provincial and local government have dual, overarching responsibility. Managers from the MDHS sub-structure^d and from the CoCT sub-district independently manage the services that fall under their jurisdiction. They also coordinate services, through the Integrated Sub-district Management Team (ISDMT), in areas agreed within the annually renewed service level agreement (SLA). In addition, as elsewhere in the country, these managerial teams are jointly and separately responsible for: Level 1 hospitals and PHC facilities; specific health programmes (e.g. environmental health and TB/HIV); contracts with

^b Figures are drawn from the 2011/12 MDHS *District Health Expenditure Review* (DHER) for sub-district and district data and from the 2010/11 *District Health Barometer* (DHB)¹⁸ for national averages. Note that the DHB data are not disaggregated to sub-district level and the 2010/11 DHER¹⁹ is the most recent that is publicly available.

^c The DHER and DHB data differ in relation to district averages. For example, for expenditure per uninsured head the DHB district average is R648. However, the DHER figures reported here as the primary focus of this chapter relate to the sub-district and only the DHER reports these data disaggregated to sub-district level.

^d The MDHS is divided into four sub-structures, each of which consists of two sub-districts. Each sub-structure manager thus is in charge of two sub-districts. This study focuses on the Mitchell's Plain sub-district. In the rest of this chapter we will use the terms "sub-district" and "sub-district manager", although the MDHS manager is, in fact, in charge of two sub-districts (Mitchell's Plain and Klipfontein).

non-profit organisations (NPOs) that support community health workers (CHWs); and a range of support services (e.g. finance, supply chain and health information). The Mitchell's Plain managers are answerable to the MDHS Chief Director and to the Executive Director of Health, CoCT, respectively. At district level, the district executive (DEX) provides joint oversight of services. Programme managers at CoCT and provincial level, such as TB/HIV managers, also provide some support to the sub-district. The MDHS Chief Director is, finally, responsible to the Deputy Director-General for the DHS at provincial level, and the Executive Director for Health to the City Manager.

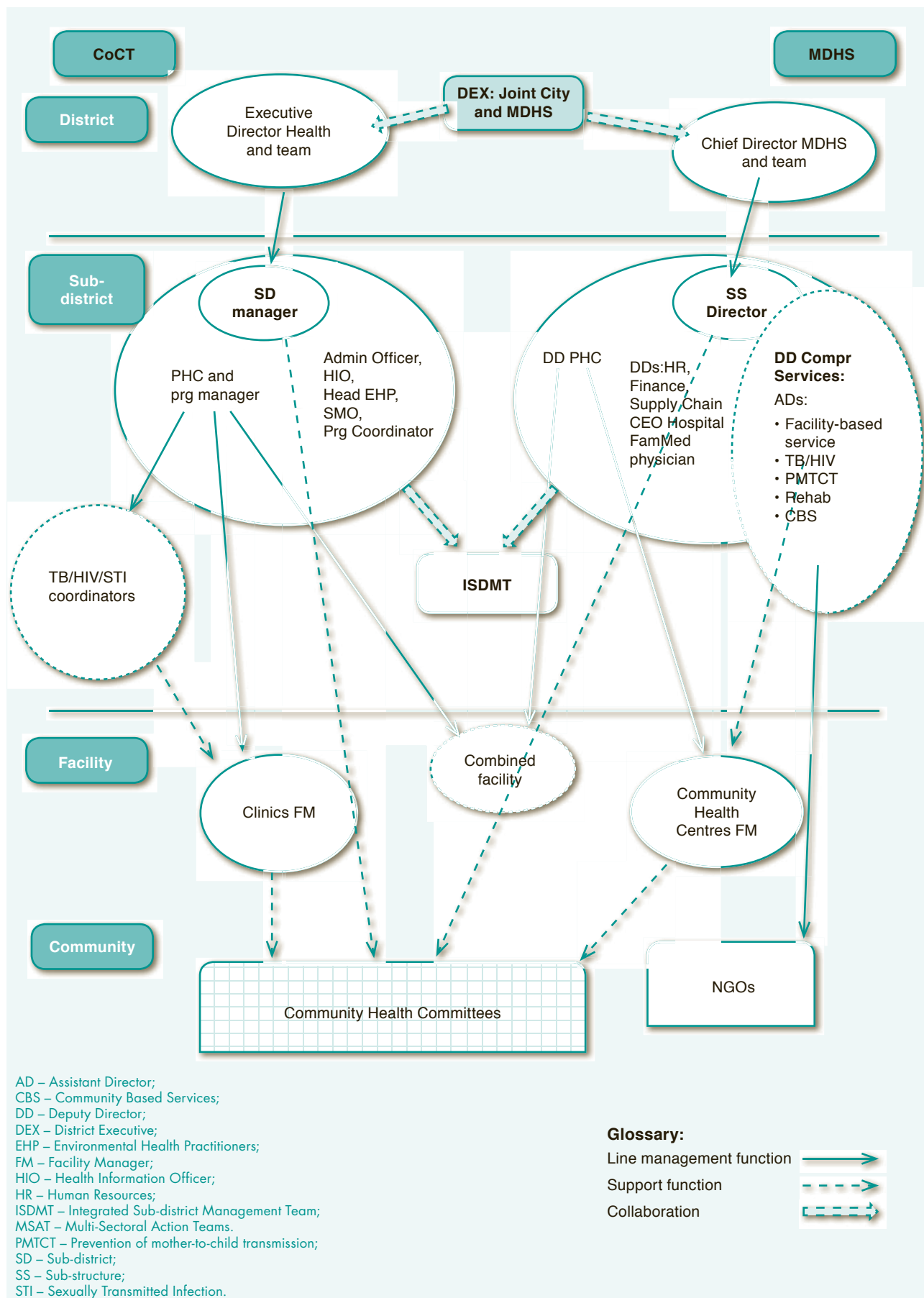
Although they work within a complex hierarchical structure, local managers now hold substantial delegated decision-making power. Both city sub-district and provincial sub-structure managers, for example, have the authority to move posts between facilities within the sub-district, aided by relevant guidelines and tools and working within existing salary budgets. In the City structures drugs are procured via the Central Medicine Depot (CMD) by the sub-district pharmacist within an allocated budget. Additional funds need to be advocated to the district executive; e.g. when antiretroviral services are introduced in a new clinic. The increased pharmaceutical needs are then included in future planning. In the MDHS, however, each facility has a pharmaceutical budget and each pharmacist, together with the facility manager, is responsible for the management of this budget and for procurement from the CMD. Finally, in the provincial structure the securing of the budget for capital equipment is a centralised process, while procurement of equipment is a sub-structure function. Similarly, in the City, purchasing equipment is decentralised to the sub-district and procurement is based on the needs of facilities. The challenge, however, is that the budget for capital equipment is always insufficient.

Organisational complexity has historical and cultural dimensions in every setting. The South African health system has a particular history of severe health service fragmentation and inequity. Today only two authorities manage health services within Cape Town. However, different histories and cultures continue to influence interactions among the sub-district actors. These include differences in their past service responsibilities. For example, local government has always focused on preventive and promotive services, basic curative services for children, and infectious disease control while provincial government has focused on hospital curative care. Local government has also followed a nurse-led service model while the province has used a doctor-led model.

Management structures in the two authorities have, moreover, evolved at different paces. The MDHS is a very new structure, as it was only formalised during the 2008/09 financial year, in line with the National Health Act (Act 61 of 2003), with new managers appointed to Mitchell's Plain in 2008. In contrast, CoCT health management structures were consolidated in 2000 and the Mitchell's Plain sub-district manager has been in the post since 2005. At the same time, although CoCT sub-district managers were previously seen as having a fair degree of decentralised decision-making authority, MDHS sub-structure managers have in a fairly short period of time been given perhaps greater levels of decentralised authority.

However, organisational histories and cultures are slow to change and South African state bureaucracies come out of a history of autocratic hierarchy and deference, which complicate and

Figure 2: Lines of authority in the Cape Town Metropolitan Health District



delay moves to encourage initiative, innovation and distributed leadership:^{8,20} "... skills gaps and deference tend to elevate the importance of rules, procedures and hierarchy for their own sake, while at the same time ambivalence towards authority undermines these".²⁰ Many of the findings of the Local Government and Health Consortium, which reviewed the DHS in the early 2000s, are still relevant today, despite substantial de-facto decentralisation of decision-making powers: "People at every level, but particularly front line managers and providers, feel that they work in isolation from others at their own level, and face a top heavy and rigid management hierarchy that imposes multiple and often conflicting demands".³

Health staff in the sub-district are often passive in their decision making and tend to wait for direction from above. At the same time, they experience managerial direction from higher levels as instructional and authoritative. The common use of bureaucratic procedures such as standard operating procedures and formal memos to guide the actions of lower-level staff adds to their experience of hierarchy and supports a compliance culture. As discussed later, these patterns represent a significant challenge for sub-district managers.

The complexity of sub-district management

Within these complex organisational health system structures, and given delegated authority, sub-district managers occupy a pivotal position: the point where strategic direction has to be translated into daily system functioning and service delivery. From this position they have to mediate between, translate and integrate national, provincial and local service plans and initiatives; take responsibility for meeting delivery targets; and manage the operational efficiency of the PHC system.

What does this mean for their routine managerial reality? This work provides three core insights, which are discussed in the sections below:

- Sub-district and managers routinely manage a mix of expected and unexpected demands, activities, and larger and smaller crises that occur at the front line of service delivery;
- They manage an intricate network of role players; and
- They engage in multiple formal and informal planning and management processes, either through meetings or through individual interactions with staff. (See Box 3)

Box 3: The 2010 measles campaign

A 2010 measles outbreak led to a large-scale vaccination campaign across the CoCT – at the time when the national (HIV Counselling and Testing) HCT campaign was beginning (and during which over 103 681 people were tested in the Mitchell's Plain sub-district alone over a 15-month period). Over a period of three weeks 113 425 (82.3% coverage) children aged between 9 months and 15 years had to be vaccinated while routine services had to remain fully functional. This not only meant that thousands of dosages of vaccines had to be distributed and kept refrigerated; it also required large-scale collaboration with schools and crèches, which had to distribute and collect consent forms and make vaccination points available. Large numbers of staff had to be reallocated to vaccination points from facilities and close collaboration had to be maintained between city and provincial services.

Decisions about the campaign were taken at provincial level and some support was provided in the form of additional human and other resources. However, the temporary reconfiguration of services, engagement with other sectors, and the responsibilities for ensuring communication, mediating relationships, ironing out operational problems and reporting and accounting were undertaken by sub-district managers and their teams. Each outreach team was supported by volunteers, which included the health committees, and non-governmental organisation (NGO) and retired staff. In some instances additional staff was procured via labour brokers to assist where there was low coverage and in large geographical areas. The campaign included careful planning before it started and daily monitoring to support reallocations of resources and priority areas.

Managing behind the front line of service delivery

Like all managers, sub-district managers simultaneously have to translate strategic policy decisions into operational directions and have to account for operational performance in relation to strategic policy objectives and targets. Their daily practice is also composed of both routines and crises; they spend an inordinate amount of time dealing with service delivery dysfunctionality, very often generated by a lack of proactive management at lower levels of the system. From the sub-district managers' perspective, facility and operational managers are often "unable to see the big picture" and some seem unable or unwilling to manage and see themselves as responsible and accountable for implementing policies.

Three typical and recurring examples of managing behind the front line are:

- efforts to enable and encourage facility managers to conduct daily assessments of clinic staffing needs relative to patient load and allocate staff to service these needs;
- encouraging facility managers to follow up and deal proactively with patient complaints (see Box 4); and
- addressing poor staff performance in such action.

In all cases the sub-district management challenge lies in enabling and encouraging facility managers to develop a proactive management role. Proactive management involves guiding or instructing facility staff, delegating tasks, and holding staff to account. Such proactive management is hampered by challenging working environments (which include very high patient numbers, staff shortages and abusive patients) and challenges of existing organisational culture, particularly nurses' reluctance to hold doctors and older colleagues to account. Many facility managers are seen either as being invisible in the facility (and thus not guiding and supervising their staff) or as spending too much time delivering services instead of fulfilling their management roles.

Box 4: Dealing with patient complaints: an example of lack of proactive management in facilities

Both the CoCT and MDHS have instituted patient complaints procedures, which require that complaints are dealt with immediately and by relevant facility managers. This system demands significant amounts of time from managers and clinicians and is seen by staff members as an added burden to their workload. Staff members also see complaints as unfair criticism coming from ungrateful patients and are thus not keen to engage with the system.

In a concrete example, the sub-district health promotion officer was at a clinic involved in a health promotion activity when she observed a confrontation between a nurse and a client in which the nurse was rude to the client. The health promotion officer intervened politely and took the nurse aside to calm her down. The nurse showed the same behaviour towards her colleague. The health promotion officer reported the behaviour to the clinic manager and to the sub-district managers. On investigation she found that the clinic's complaints book contained a large number of similar complaints about the nurse. A sub-district manager subsequently intervened and confronted the facility manager about her lack of response to and engagement with her staff member's behaviour, which should have been addressed in terms of the City's disciplinary code.

In sub-district managers' experience, this lack of proactive action by facility managers is common and requires frequent and often repeated time-consuming intervention in the micro management of facilities.

Dealing with staff discipline, which includes dealing with theft and abuse of government resources, is another key feature of routine sub-district managerial practice. Although they vary in degrees of severity and formality, disciplinary processes are time- and energy consuming. They require numerous meetings and often conflictual engagements with relevant staff. Sub-district managers are also, ultimately, held responsible for patient complaints that originate at facility level. As shown in Box 4 responding personally to patients or following up on other managers tasked with dealing with complaints is time consuming. Having the experience and confidence to navigate the complexity of HR procedures and personal relationships is vital for sub-district managers.

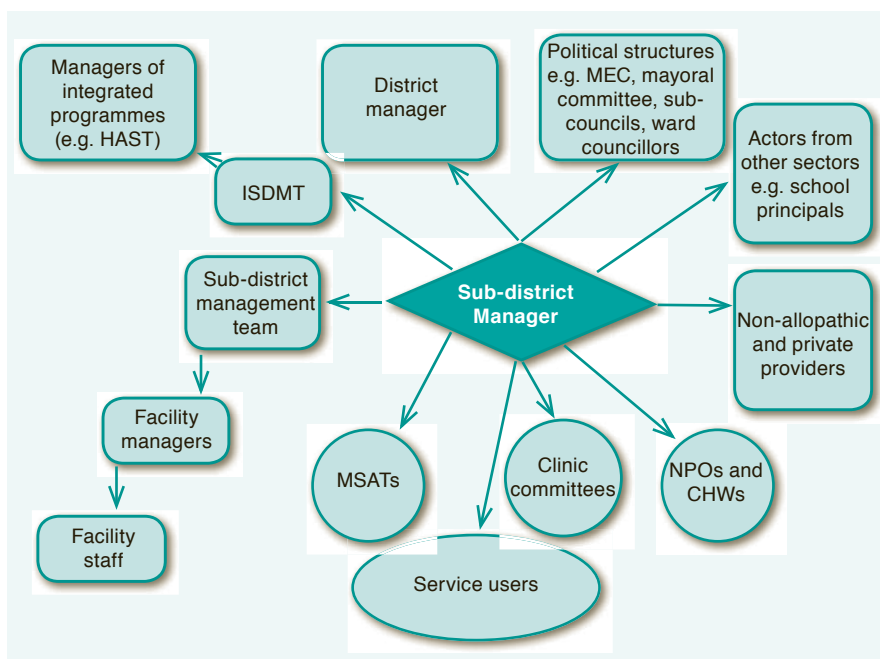
Managing multiple actors

The central task in navigating the structural complexity of sub-districts described earlier is engagement with the multiple actors that inhabit these structures. (See Figure 3.)

Sub-district managers not only routinely engage with their teams and the staff who report to them, as described above ("managing down"), but also "manage up".²⁰ They do this through their formal lines of reporting and accounting to district level and by informal reporting and accounting through frequent, ad hoc meetings with district managers and politicians (e.g. when the member of executive council (MEC) or mayoral health committee member visits the sub-district). Managing up also includes advocacy for local priorities and needs within district planning and management processes and for resources to meet service delivery imperatives brought down the system from higher levels. These imperatives can be annual service delivery targets or centrally led campaigns, such as the 2010 HCT campaign, or unforeseen health 'events', such as the 2010 measles outbreak in Cape Town.

In addition, sub-district managers also "manage out" through multiple engagements with structures and processes beyond the health sector. These include engaging and ensuring the functionality of clinic committees; participating in civil society structures such as the City's Multi-sectoral Action Teams (MSATs); and participating in, receiving instructions from and accounting to Integrated Development Plan (IDP) processes and public consultations. Engagement also takes place with colleagues and structures from the parallel authority, through the ISDMT, and in programme areas where the authorities share responsibility (e.g. the HIV, AIDS, STI and TB (HAST) programme).

Figure 3: The sub-district manager's actor network



Managing meetings and planning processes

The final set of managerial routines in Mitchell's Plain, as in other sub-districts, encompasses a range of formal and informal, regular and ad hoc meetings and planning processes.

Regular meetings in "one-on-ones" provide an important space for sub-district managers to engage in depth with their staff, to discuss progress and challenges and to guide and mentor. These meetings are complemented by ad hoc meetings and engagements as the need arises and quarterly supervision visits to all facilities. In this sub-district the CoCT sub-district manager and PHC coordinator meet monthly on a one-on-one basis with all facility managers and conduct monthly supervision visits to all PHC facilities. In the MDHS, the Deputy-Director: PHC also ensures that all PHC facilities are visited monthly. Both authorities use audit tools in their supervision visits, although these are different tools. Supervisors prepare written reports on the basis of the visits.

Within the MDHS, and following provincial frameworks, a performance appraisal system also exists in which each employee, including facility managers, establishes a set of personal performance targets for quarterly review with line managers. These performance targets may lead to development plans in response to poor performance or cash bonuses for excellent performance (shared among all facility staff). In the CoCT, however, performance appraisal procedures currently apply only to sub-district managers, heads of environmental health, programme managers and programme coordinators and do not apply to facility managers.

The sub-district managers also meet regularly and on a personal basis with the MDHS Chief Director and the Executive Director for Health, CoCT, respectively. Budgets are a standing item at these meetings, which provides the opportunity to discuss changes, needs and challenges.

Formal meetings are used to make collective decisions through negotiation, mediation, instruction and persuasion. Joint meetings at different levels allow coordination between authorities within the broad framework of the SLA. Within each line of authority, meetings at different system levels provide opportunities for managers higher up the system to communicate with lower-level managers, hold them accountable for the performance of their services and offer them support and mentorship. Lower-level managers can bring service delivery problems and needs to the attention of higher-level managers at these meetings. The strong emphasis on performance accountability is indicated by the naming of several meetings as "plan, do, review (PDR) meetings". This name indicates that these meetings are used to review service performance indicators against target levels with the intention of identifying problems that undermine service delivery and of considering appropriate remedies.

These various sub-district meetings are part of wider health planning processes. District health plans and district health expenditure reviews are nationally agreed processes that are aligned with national planning frameworks that emanate from National Treasury and the Department of Health (such as the Medium Term Strategic Framework and the NDoH Strategic Plan). This means that, as in other provinces, the Western Cape's Annual Performance Plan (APP) is nested within the provincial five-year strategic plan and provides the basis for quarterly performance reports to the NDoH against a combined set of nationally prescribed indicators (and any identified by the PDoH as provincially relevant and aligned with

national health system objectives and targets). The annual MDHS District Health Plan links with the provincial APP and identifies priorities and sets performance targets for MDHS services and facilities. Through the SLA targets and priorities are set for those provided jointly with the CoCT.

In Mitchell's Plain an additional complexity exists, which is working within the planning cycles of two authorities – including the different financial years of local and provincial governments. In parallel to the provincial government, the CoCT develops its own business plan. This plan is informed by the Integrated Development Plan (IDP), developed across sectors and through consultation at local level, and establishes priorities and targets for CoCT services and facilities. Targets that apply to the Mitchell's Plain sub-district are, therefore, cascaded down the health system through both lines of authority and, as noted, are regularly reviewed in the PDR meetings.

Health planning processes seek to provide forward direction through health system complexity, in pursuit of improved health system performance – focused on future population health needs rather than past service provision. However, as elsewhere in South Africa, in Mitchell's Plain this forward movement faces two key challenges. First, the link between plans, targets and operational budgets is tenuous as historical budgeting remains the norm across the country (with only year-on-year incremental adjustments linked to inflation). Second, planning processes are implemented within the wider organisational culture of hierarchy and deference. Nationally, the implementation of the Public Finance Management Act (PFMA), for example, is widely understood to be about compliance with specific rules rather than value for money in performance.²¹ In Mitchell's Plain, target setting and review in PDR meetings is also quite widely perceived as an instructional and compliance process.

Nonetheless, the annual planning process provides a framework that has brought predictability and standardisation to planning and management across the MDHS. It has also established a joint planning platform for coordination not only of MDHS/CoCT service provision but also between programmes and facilities. Given the very fragmented service provision of the past, this represents a new way of doing business and one that is necessarily and appropriately oriented towards the provision of comprehensive PHC services. The provincial Comprehensive Service Plan of 2010-2020 has helped the Mitchell's Plain sub-district with the construction of a new district hospital to strengthen the service platform. This has filled a severe key service gap.

Doing business differently

With the planned and actual devolution of authority to sub-districts, South African sub-district management must take on, as central to its work, the functions of managing strategically, guiding innovations and providing direction, and proactively planning for and managing resources to address local needs. "Doing things differently", problem solving to improve service delivery, making better use of existing resources and translating strategic priorities and direction into operational functioning are the tasks that take up the time of sub-district managers. Yet, as the Mitchell's Plain experience illustrates, the existing organisational culture, combined with staff not taking ownership of new actions, underpins operational inefficiency, undermines the persistent action necessary to sustain service improvement and prevents the benefits of higher-

level planning filtering down into daily practice. Those at the bottom of every health system have discretionary power and through their daily practices act, mostly inadvertently, to subvert new directions.

The existing ways of working are a constant reminder that mind shifts and learning to do things differently take time and require capacity, confidence and trust. Sub-district managers solve crises while simultaneously building the capability and commitment of operational and facility managers so that they can reduce the need for crisis management and improve service delivery.

Against this background, the three conceptualised innovations of the DIALHS project outlined below all aimed to encourage managers to plan ahead, take ownership of their authority and build confidence, either within routine processes or through new initiatives. The innovations aimed at providing constructive accountability among health system actors. All of the innovations have engaged front line staff and all represent adaptations of existing operational routines that aim to change mind-sets and link to larger-scale planning processes. In this sense, they represent “small wins” – changes in routines that are small enough to be accepted and easily implemented, but that have a ripple effect in the system and generate longer-term and larger-scale benefits.²²

Three of these innovations are outlined in more detail below. Each sought to:

- support trust building and relationship development among actors at the front line of the sub-district health system and encourage collaborative and pro-active problem solving to improve operational efficiency; and
- develop personal confidence, technical skills and relationships of constructive accountability that can sustain action to improve policy implementation and service delivery.

Whereas two of the innovation ‘cases’ represent changes in routine management practices, the third case is a new initiative, which was aimed at modelling new ways of thinking about planning and management within a stronger population orientation for sub-district healthcare delivery. Of the three, the re-organisation of the monthly PDR meeting as the Management and Communication (M&C) meeting most clearly fits the definition of a small win. However, the facility manager “key performance area (KPA) process” also built on existing planning and HR management processes and even the community profiling initiative built on a history of community/service engagements and drew in existing clinic committee structures.

All three initiatives reflect the critical role of sub-district managers and their teams in galvanising actors in the sub-district and building capacity to improve routines and relationships.

Box 5: Innovations arising out of the DIALHS project

Innovation 1: Developing pro-active management

In late 2010, the sub-district manager initiated a discussion about the monthly PDR meeting with those who routinely attend it. The core features of the re-organisation were then decided and implemented in 2011.

In re-naming and re-organising the meeting, the sub-district intended to encourage facility managers to take a more proactive approach to problem solving and forward planning to improve services and operational efficiency. A new name, the M&C meeting, signalled the desire to move away from a confrontational stance that held people accountable for service targets to a new approach that emphasised a supportive engagement, sharing of good practice, collaborative learning and accountability for improved efforts.

Beyond the name, the core changes were:

- ❖ a different seating arrangement to allow small-group discussion and dispersed authority;
- ❖ a new agenda structure focused on joint planning for new activities; progress reports on planned activities; sharing of best practices among facility managers; review of selected programmes and other concerns;
- ❖ a chairing style that facilitated discussion and debate and challenged participants to improve services for population benefit rather than adopting a more didactic and instructional communication style; and
- ❖ careful minute taking to allow tracking and reporting of action over time.

The sub-district manager initiated the meeting re-organisation because she wanted to tackle the lack of understanding and ownership of new activities among facility managers and the perception that targets were imposed on them rather than an opportunity for service improvement. Her underlying intentions were to develop the meetings as a space to: a) generate a shared understanding among facility managers about the issues discussed and build their commitment to implementing agreed action; and b) build the relationships among all sub-district staff that enable coordination of service improvement efforts (e.g. between facility managers and sub-district administrative staff or between facility managers and EH staff). She also hoped to provide a role model of a meeting style that facility managers would use in their own staff meetings.

Her assumptions were that opening up the meetings to discussion and with a more problem-solving focus would make them less threatening; support a two-way flow of ideas between sub-district and facility managers; contextualise new activities implemented in facilities for programme and administrative support staff; and generate a sense of shared accountability.

The work carried out in the meetings is backed up by the sub-district manager's efforts to:

- ❖ manage down through: special task teams that comprise various sub-district staff planning, which are established to support new activities; monthly facility supervision visits by sub-district managers; and the allocation of environmental health practitioners (EHPs) to facilities;
- ❖ manage across through: engagement in the ISDMT, or personally with MDHS colleagues where joint strategy or shared support is needed;
- ❖ manage up through: engagement with MDHS/CoCT district managers to tackle challenges faced in implementation or by securing support (agreement, guidance, resources) for implementation.

Innovation 2: Developing local service-improvement priorities

For the first time, in late 2010 and for the 2010-11 financial year, CoCT facility managers and other staff were asked to develop eight KPAs within the overarching priority areas of the IDP and CoCT Business Plan. The process was then repeated, focused on four KPAs in 2011, for the 2011-12 financial year.

The aim of the new process was to encourage forward planning for service improvement and sustained effort in tackling priority service delivery challenges. This initiative aimed to achieve this by setting clear local objectives and outlining activities, intended outcomes and monitoring and evaluation (M&E) approaches.

For PHC facilities, the key aims of the process were to:

- ❖ allow managers to set priorities that reflected their clinics' local needs, while taking account of the overarching strategic planning frameworks and priorities and of their own job descriptions;
- ❖ focus on tackling critical service delivery challenges, the bottlenecks in the system that prevent the sub-district from implementing agreed on and planned service improvements;
- ❖ encourage/require managers to identify priorities with their staff – so that the initiative becomes a local initiative from the staff; and
- ❖ prepare a written document in which the priorities are summarised.

KPA examples include: tackling staff shortages (linked to use of staff), absenteeism and poor record keeping (all of these are system challenges for any service-improvement effort).

The sub-district manager initially discussed the new approach in the regularly monthly PDR meeting (as it was then still called) in late 2010. She then provided one-on-one mentoring support to facility managers in the development of their KPAs. This support was focused on helping the managers to formulate objectives, think about evaluation and reflect on the implications of these objectives for their management activities. A workshop was then organised for all sub-district staff (facility managers, doctors and all other managers) to present their KPAs to others. Quarterly reviews on a one-on-one basis allowed KPA implementation to be monitored over 2011. At the end of the year managers gave feedback on the implementation of one KPA in the monthly M&C meeting and presented a written report in which they evaluated their progress in meeting all their KPAs. In 2011, the process was repeated but this time focused on only four KPAs and used regular meetings as opportunities for review and reporting.

The sub-district manager initiated the KPA process with the intention of addressing a lack of understanding about planning among facility managers and their lack of ownership of sub-district priorities and related activities.

Her assumptions were that the process would:

- ❖ develop priorities of relevance to local settings nested within the IDP/Business Plan priority areas and within the wider system processes;
- ❖ generate a sense of ownership of higher-level priorities and related activities among facility managers and develop local priorities that would support their implementation;
- ❖ develop managers' own capacities to use data and information in identifying problems and setting priorities, monitoring achievements, analysing the underlying causes of problems, and preparing written documents; and
- ❖ encourage managers to engage their own staff in thinking about problems and activities for addressing them, selecting priorities, and using information.

Priorities and feedback on meeting them were discussed in meetings as it was assumed that this would support mutual learning and understanding, generate debate and discussion, and allow opportunities for sharing ideas about how to manage crises and plan ahead. In this way it was hoped to build managerial confidence in coping with crises.

Overall, the KPA process can be seen as a capacity development initiative. It was a form of continuing professional development in that it strengthened managerial capacity to plan ahead and act proactively, and encouraged persistent and sustained effort. It was complemented by the re-organised management and communication meeting.

Innovation 3: Generating local knowledge, priorities and action

In early 2011 the sub-district initiated an activity that aimed to strengthen three inter-related planning and management priorities in the sub-district. The first priority was “shifting the lens” of service providers from a patient orientation to a stronger population orientation in health system organisation and functioning, as advocated by provincial and national policy guidelines. The second priority was to move the sub-district’s thinking and vision beyond one-year planning cycles and the third priority was to strengthen relationships between service providers and community representatives. Provincial and district management had recently emphasised the need to address the health of populations rather than patients alone. Yet facility managers had repeatedly expressed uncertainty and frustration that they “did not know the communities they were serving”, did not know how to engage with other role players or access other health resources in communities, and were overwhelmed with the need to service short-term targets instead of being responsive to local priorities and needs.

To explore and practise alternative ways of collaborative planning and prioritising a team consisting of service partners from both city and provincial health authorities, NPOs, statutory clinic committees and civic organisations and community-level partners conceptualised and implemented a series of multi-stakeholder workshops. Nurses, NGO staff, representatives from local community structures such as health committees and police fora, environmental health practitioners (EHPs) and others from a geographically defined local area met in “local area groups” to discuss and map available health resources to needs and gaps. While the physical maps that emanated from these workshops provided useful information, the workshops were more important in that they brought health stakeholders in Mitchell’s Plain into conversation with each other. Discussions led to a number of quite practical and immediate actions, such as negotiations with the local taxi association about the possibility of changing a taxi route to improve access to one facility. The initiative particularly emphasised the importance of EHPs as crucial players in a population-based approach to health planning. And, lastly, at the end of 2011 the local area groups that had been formed were invited to the sub-district’s annual planning event to contribute their ideas and priorities to the development of the 2012 sub-district plan. Apart from small but tangible wins, the initiative succeeded in overcoming or at least lowering perceived barriers between different groups and bringing actors into conversation with each other, thus confirming the importance of building networks, drawing on informal knowledge of multiple actors, and creating fora for engagement outside of established structures.

Despite initial enthusiastic support, the initiative was difficult to sustain in 2012. Work has continued, although haphazardly, in two of the four local groups. Their experience may provide lessons on how to re-energise the process across the whole sub-district. The potential value of this type of innovation is, moreover, receiving attention across the country, with a range of initiatives beginning to demonstrate the potential benefits of these sorts of community-level engagements to the health system (e.g. Letsema Circle).

Across innovations, some early signs of positive impact are summarised in Table 1. However, it is still too early to judge whether they will take root in daily practice and will generate operational efficiency and performance benefits. Contextual pressures played an important role in constraining all Mitchell’s Plain activities in 2012. Unforeseen leadership changes and the dual lines of accountability in Mitchell’s Plain have maintained an uncertainty in the wider sub-district context that acts as a barrier to finding and embedding new ways of doing things. In addition, changing routines and mind-sets takes time and more time is needed to nurture, reinforce and track the persistence of the changes discussed here and what their spin-off effects might be. Small wins are small because they do not immediately destabilise the existing situation – the challenge is to identify the leverage point for spreading effects more widely.

Conclusions: lessons for health system development

This case study offers insights into the routines, activities and relationships that represent the complexity of one South African urban sub-district health system. It paints a picture of multiple demands, competing priorities and resource constraints, targets and policy directives. It also points to the need to manage and coordinate numerous actors within and outside the system and to the existence of organisational cultures and legacies of deference and hierarchy, which undermine efforts towards decentralisation and innovation. It demonstrates the influence of organisational software over collective capacity and resilience. Managing in this environment is a multifaceted and multi-dimensional task and requires a constant shift in focus, lens and pace.

Although many management models exist, the work of Henry Mintzberg offers explanations and understandings of management that have clear resonance with the experiences presented here and with the wider South African health experience.⁷²⁴ Mintzberg’s four facts about managers clearly reflect the Mitchell’s Plain and South African experience. (See Box 6) Describing managing as being about “calculated chaos” and “controlled disorder”, Mintzberg notes that “the pressures of the managerial environment do not encourage the development of reflective planners ... This job breeds adaptive information manipulators who prefer the live, concrete situation”. His model of managing encompasses the three roles of managing up, out and down discussed earlier in this chapter. It sees managing as always several steps back from the action – and involved in working through other people to get

Table 1: Preliminary signs of innovation impacts

M&C meetings	KPA process	Community profiling
<ul style="list-style-type: none"> Positive performance gains in activities discussed in meetings; e.g. isoniazid coverage improvement from 35% to 60% Engagement of health promotion officer in supporting facility managers in reproductive health service provision in schools Sub-district perception that some facility managers have taken more ownership of activities and used information to make decisions 	<ul style="list-style-type: none"> Facility managers told the sub-district manager they felt it was very useful and long overdue Sub-district manager feels that skills have been developed; e.g. in setting objectives; process has been accepted and priorities are increasingly being ‘owned’; improved understanding of how to manage systems and processes to improve outcomes 	<p>In 2011 there was:</p> <ul style="list-style-type: none"> Great enthusiasm expressed for the collaborative work among all participants, who often spoke about the benefit of getting to know other health actors and learning more about health services or the communities served Several groups began to take local action and deal with specific local health issues Very importantly, the sub-district’s annual planning was informed by the initiative in terms of format and substance

things done by using information and by “coaching, motivating, building teams, strengthening culture and so forth.”²³ The model, nonetheless, places managers at its heart and emphasises that the way managers frame their work and how they schedule activities sets the context for the others with whom they work.

Box 6: Facts about managers

- ❖ Managers work at an unrelenting pace; their activities are typically characterised by brevity, fragmentation, and discontinuity; and they are strongly oriented to action.
- ❖ Managers tend to favour informal communication media, especially telephone calls, meetings and email.
- ❖ Managing is as much about lateral relationships among colleagues and associates as it is about hierarchical relationships.
- ❖ The manager is neither conductor nor puppet: control to the extent possible tends to be covert more than overt, by establishing some obligations to which the manager must later attend and by turning other obligations to the manager’s advantage (effective managers are not those with the greatest degree of freedom but those who use whatever degrees of freedom they can find).

Source: Mintzberg, 2009.²³

In this chapter we have discussed the complexity of health sub-districts and districts. We have demonstrated that managers at this level must be able, willing and confident to manage in “calculated chaos”. We have also presented some ideas about the practice of managing in this complexity – of leading change from within the health system. These experiences suggest that it is important to develop the DHS’s daily routines, its software, to nurture the relationships of constructive accountability that support persistent and adaptive problem solving aimed at enhanced service delivery and patient care.

They also suggest that leadership development programmes must, first, help managers “deal with the calculated chaos of managing – its art and craft...”²³, by developing the managerial mind-sets – or competencies – of reflection, analysis, worldliness, collaboration and action. Second, such programmes must allow learning to be carried back into the organisation – by supporting teams of managers in driving organisational change. As Gilson and Daire proposed in 2011, leadership development programmes must, therefore, focus on generating values-based leaders that are able to manage complexity; be provided beyond the classroom and in the workplace; and be sustained through continuous learning.⁸ They must also work towards changing the system within which people work, even as they develop people as leaders.

Strengthening the South African health system is, in essence, about generating an internal capacity to learn and adapt over time, about building its resilience and responsiveness to meet changing population health needs – for which management and leadership development is a central requirement.

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Medicines, Vaccines and Technology



Medicines Selection and Procurement in South Africa

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The main objective of South Africa's National Drug Policy (NDP), adopted in 1996, was to support equitable access to medicines by addressing a full range of components: legislation, selection, pricing, procurement and supply, human resources and traditional medicines as well as cooperation with regional and international organisations. The objective of this chapter is to review the medicines selection and procurement components of the NDP. Medicines selection in both the public and private sectors in South Africa has undergone significant transformation in the past 16 years. The implementation of the national Essential Medicines List and supporting structures in the form of provincial and facility-based Pharmacy and Therapeutics Committees has introduced levels of rigour in assessment of medicine selection but still needs improvement.

The procurement of medicines is also in the process of reform, with proposals for establishing a centralised procurement unit, referred to as the "Central Procurement Agency". The relocation of medicines tender processes from the National Treasury to the National Department of Health appears to have had some impact in reducing the cost of medicines and improving access and availability. The potential role of state-owned manufacturing of pharmaceuticals is also discussed.

Medicines selection in both the public and private sectors in South Africa has undergone significant transformation in the past 16 years.

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Introduction

It has been 16 years since South Africa's National Drug Policy (NDP) was officially announced and adopted.¹ The NDP sought to reform the health sector in a way that would bring about an improvement in medicines access and use in both the public and private health sectors. Figure 1 shows the three main objectives of the NDP, each with its specific set of sub-objectives.

The World Health Organization (WHO) identifies two key prerequisites for the successful implementation of an NDP.² The first is to have a system for monitoring and evaluation. This is a constructive management tool that enables a continuous assessment of progress and helps in the decision making. The second is that the NDP should be periodically evaluated. Such evaluations should form an integral part of the pharmaceutical master plan (a prioritised implementation plan for the policy), with the necessary resources allocated from the start. Independent consultants or professionals from other countries or from the WHO may be invited to complement a national evaluation team.

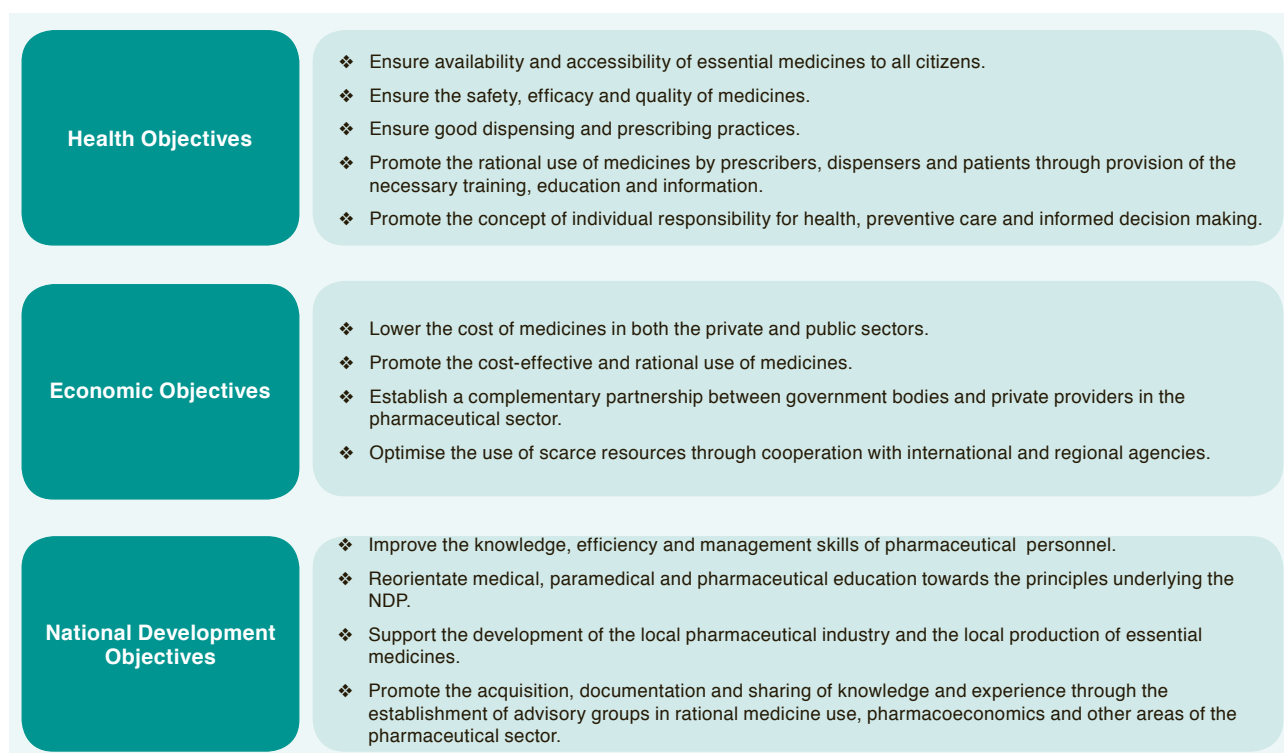
Although the original policy document committed to conducting regular evaluations of the NDP, no official, comprehensive review of the South African NDP and its impact has been conducted since its adoption in 1996. However, some assessments have been carried out. Provincial surveys on the NDP were conducted by the National Department of Health (NDoH) between 1996 and 1998 in seven of South Africa's (SA's) nine provinces.³ These surveys were conducted to establish baselines for future monitoring of progress in terms of the implementation of selected aspects of the NDP. While medicines availability was found to be just over 85% both in the hospitals and primary health care (PHC) clinics in the provinces surveyed, awareness of the NDP was found to be quite

low (below 40% on average). Follow-up surveys were carried out in all the nine provinces and six metros of SA in 2003, with the aim of determining the impact of the NDP at PHC level.⁴ The availability of medicines was again found to be high (on average, 82% of a basket of key medicines). However, significant challenges were noted in terms of stock control (for instance, 50% of stock records were inaccurate) and rational medicines use (in 7% of facilities, 50% or fewer patients knew how to take their medicines). A marked increase in the proportion of patients prescribed an antibiotic was noted, up from an average of 25% in the 1996 to 1998 baseline surveys to 47% in 2003. However, some progress was noted in the percentage of patients that received an injection (down from 11% to 5%).

In 2005, the Human Sciences Research Council (HSRC) sought to evaluate the impact of the NDP on the availability of medicines in the public and private sectors of two provinces (Limpopo and Western Cape). The HSRC concluded that some notable progress had been achieved. However, considerable input, in terms of improved infrastructure and training of healthcare workers, would be required to improve procurement and distribution practices.⁵ All the public sector hospitals visited had a copy of the national Standard Treatment Guidelines (STGs), and this resource was also found in 77% of private general practitioners' practices and 43% of private pharmacies, even though it was not officially applicable in such settings. This survey again found high levels of antibiotic prescribing in all settings.

Perhaps the most comprehensive assessments of progress in the public sector's pharmaceutical services are the 2005/6 series of audits requested by the NDoH and conducted by Rational

Figure 1: Objectives of the NDP



Source: National Department of Health, 1996.¹

Pharmaceutical Management Plus (RPM Plus), a USAID-funded programme managed by Management Sciences for Health (MSH).⁶ The purpose of the audits was to assess and measure the extent to which pharmaceutical services in the public sector complied with the Medicines and Related Substances Act (Act 101 of 1965) and the Pharmacy Act (Act 53 of 1974), to recommend ways of attaining such compliance, and to estimate what it would cost to bring public sector facilities to the required levels of compliance. However, the results of these audits have never been placed in the public domain, thereby making them inaccessible to other researchers or policy makers outside of the Department of Health.

Since 1997, chapters in various editions of the *South African Health Review* have been devoted to aspects of pharmaceutical services and to the implementation of the NDP, such as medicines pricing in the private sector and policy and legislation.⁷⁻¹¹ Most recently, in the 2007 edition, Taylor discussed the rationing of medicines and healthcare technology and reviewed the impact of various legislative reforms, such as the dispensing fee and the single exit price (SEP), on the cost and utilisation of technologies.¹² A review of health legislation and policy in 2010/11 describes the effect of various measures, which include the SEP and the logistics fee, aimed at regulating medicine prices in the private sector.¹³

Undoubtedly, much has happened in the country's healthcare system and there is a need for a comprehensive review of the NDP. The decision to embark on a national health insurance (NHI) system has to be the most compelling reason for such a review to be undertaken.

The focus of this chapter is on the medicines selection and procurement aspects of the NDP. Medicines selection is discussed in the context of reforms that would be necessary as the country gradually moves towards NHI. The chapter also assesses recent developments in medicines procurement in the public sector, notably the impact of reforms in the tender system. Finally, the chapter discusses the merits of a state role in the manufacturing of active pharmaceutical ingredients (APIs) as an option for reducing medicines expenditure.

Medicines selection

Medicines selection is a key factor in the successful implementation of access to equitable health care.¹⁴ Medicines selection should be based on the principles of health technology assessment (HTA) and include assessment of the evidence-base for the medicine choice and pharmacoeconomic evaluations. Decisions around the selection of a medicine for inclusion on a formulary or medicines list should also take into account issues such as access and implementation. The funding of medicines is subject to further conditions such as budget impact (to the funder) and affordability (by the patient). In the private healthcare sector in SA, the funding of medicines is subject to complex medical scheme rules and policies regarding the type of health plan and the benefits that a member has selected. This is discussed in more detail below.

Medicines selection in the private sector

Medicine formularies and guidelines

Generally, clinical decisions regarding the selection of medicines for formularies are made within each medical scheme, as implemented by medical scheme administrators. The level and breadth of expertise utilised in the selection process can range from a single medical advisor to teams of evaluators made up of pharmacists, nurses, medical practitioners and other experts in public health or health economics.

The selection of medicines for private sector formularies is dependent on the type or class of medicine. For high-volume, low-cost medicines such as statins or angiotensin-converting-enzyme (ACE) inhibitors the selection is generally based on price. However, where high-cost medicines are considered for selection, these are subject to a more thorough evaluation, which includes clinical efficacy and effectiveness, cost-effectiveness and budget impact.

Selection of medicines under prescribed minimum benefits

Prescribed minimum benefits (PMBs) are defined to ensure a minimum benefit for all beneficiaries and are considered to be comprehensive and thorough. They cover nearly 270 conditions: for each condition, the minimum service level is comparable to that provided in the public sector. Medical schemes are allowed to manage their benefits and control costs with measures such as:

- designating service providers for PMB services;
- employing a formulary and associated management tools such as a pre-authorisation (i.e. patients must fulfil certain requirements as laid down by the medical scheme prior to authorisation for funding being issued) and protocols;
- establishing risk-sharing arrangements with different types of providers; and
- contracting with specified hospitals or hospital groups to provide services.

The Regulations to the Medical Schemes Act (Act 131 of 1998) also specify that schemes must pay for the diagnosis, medical management and medications of a specified list of common chronic conditions, estimated to cover about 75% of the chronic conditions seen in primary practice. The initial 25 chronic disease list (CDL) conditions, as drawn up in 2003, included, among others, asthma, cardiac failure, chronic obstructive pulmonary disease, diabetes, epilepsy, hyperlipidaemia, hypertension, Parkinson disease, schizophrenia and rheumatoid arthritis. The medical treatment options for each CDL condition were laid out in therapeutic algorithms, which were developed by the Council for Medical Schemes in 2003. The list was subsequently increased to 27 conditions, with the addition of the requirement that medical schemes provide at least the antiretroviral (ARV) treatment provided in the state (after 2004), and with the addition of the Bipolar Mood Disorders (BMD) Therapeutic Algorithm in 2009. However, the remainder of the algorithms have not been updated since they were published in 2003. The list of these medicines, in effect, constitutes a PMB formulary of medicines that must be funded for all patients, regardless of whether they have a Medical Savings Account or remaining funds in their plan type.

A review of the medicines listed in the CDLs in 2009 showed that all but three of the CDLs had generic alternatives to the medicines listed at the time of the study.¹⁵ The PMB formulary, however, does not necessarily specify particular medicines and may only prescribe a class of medicines (e.g. ACE inhibitors). Each medical scheme is allowed to use a selection process to create its own PMB formulary on the basis of principles of evidence-based medicine, cost-effectiveness and affordability. Often this is subject to negotiation with the pharmaceutical manufacturers on the price of the proposed medicine. In this way, substantial SEP reductions can be achieved for selected medicines for the whole of the private sector market.

However, certain medical schemes believe that being compelled to pay in full for the treatment of PMBs could negatively affect their sustainability. The Board of Healthcare Funders, to which most of the country's medical schemes are affiliated, lost a court case in November 2011 against the Council for Medical Schemes, in which it attempted to get the court to place a limit on how much the schemes should pay for PMBs. The Minister of Health is reportedly in discussions with the Competition Commission over suitable mechanisms for addressing the issue of setting tariffs in the private healthcare sector.

Medicines selection in the public sector

The WHO advocates that procurement should take place against a list of essential medicines. The selection of medicines that are available for procurement in the public healthcare sector in SA takes place through the National Essential Medicines List Committee (NEMLC) and provincial and facility-based Pharmacy and Therapeutics Committees (PTCs).

In an unpublished analysis of provincial expenditure conducted by a Ministerial Task Team on Procurement in 2009, the following challenges were identified:

- high use of single-source medicines and medicines for which there were no generic equivalents;
- apparent lack of adherence to the nationally determined STGs;
- high levels of buyouts, outside of the nationally determined tenders;
- high usage of expensive medicines, particularly in oncology; and
- inappropriate usage of medicines that were not cost effective and were not listed on the national Essential Medicines List (EML).¹⁶

Standard Treatment Guidelines and Essential Medicines Lists

Currently the initial selection of medicines for the public sector is determined by the ministerially appointed NEMLC,^a as advised by its Expert Review Committees. These review committees are made up of a mix of experts with clinical, process and methodological knowledge. Each expert takes responsibility for a set of STGs and the accompanying EMLs. These are the Primary Care STG/EML, the Hospital Level (Adult) STG/EML, the Hospital Level (Paediatric) STG/

^a In South Africa the term "drug" was initially used when referring to the "Essential Drug Lists". The WHO advises that the term "medicines" be used instead and, accordingly, the South African usage has changed.

EML, and the newly released Tertiary and Quaternary Care EML. The Tertiary and Quaternary Care EML is intended to be a dynamic document, which will be continually updated and issued only in electronic format. The first edition, published on 2 November 2012, is a list of medicines that are recommended, or, in some cases, that are not recommended, for use at tertiary provincial or quaternary (academic) hospitals.¹⁷ Each medicine was reviewed by the relevant committee in relation to specific clinical indications and settings. For example, a medicine (e.g. botulin toxin) may be recommended for focal dystonias, but not for spasticity. Where a medicine was explicitly stated as not recommended, this was because the committee had deemed it lacking in terms of availability of robust, high quality evidence regarding its efficacy and effectiveness or had identified a potential to cause undue harm.

While some experts serve on more than one committee, the Expert Review Committees generally act independently of each other. The decisions of the NEMLC, for the most part, guide procurement of medicines in the public sector and form the basis for initiating medicines tender processes. In relation to programmes funded through conditional grants (notably the ARV programme), these decisions are binding at provincial level.

The provincial PTCs also have a degree of autonomy, as their provincial Member of the Executive Council (MEC) or Head of Department enables them to make selections of medicines funded from provincial budgets. While the provincial PTCs may provide input into the NEMLC and take advice from that structure, no formal central advisory body exists that applies evidence-informed and health economic principles to making recommendations. Decision making regarding the selection of health products may, therefore, vary from province to province, which results in inequitable access to medicines and other health-related products. Enabling closer coordination between provincial PTCs and formalising the decision-making process are likely to be key challenges faced in the proposed NHI.

The challenge is especially acute in relation to high-cost items such as the new biologics and oncology medicines. Currently, selection decisions about high-cost medicines and technologies are not consistent and more often than not appear to be based on the persuasive powers of the specialists that request the product. Clinical evaluation is carried out, but formal investigation into the cost effectiveness of the product rarely occurs. In addition, no follow-up process exists that measures the outcomes (both clinical and cost) of selecting such products. Indeed, in most instances of medicine selection, measurement of costs and outcomes is lacking.

Nonetheless, a measure of success has been achieved with the application of pharmacoeconomic analysis in some selection processes. An example is the selection of capecitabine for the treatment of metastatic colorectal cancer, which led to the treatment being approved by the NEMLC in 2012.¹⁸

Role of the Pharmacy and Therapeutics Committees

While each of the provinces is expected to have a fully functional provincial PTC and local committees at each hospital, progress in this regard has been patchy. In the last quarter of 2011, the Gauteng Provincial PTC was re-instated with a range of sub-committees (Safety and Quality; Rational Medicines Utilisation;

Formulary; and Procurement Advisory). These sub-committees made significant progress in achieving their goals for 2012. The Western Cape and KwaZulu-Natal have been identified as more successful than the other provinces in selecting medicines. All of the PTCs that exist have faced considerable challenges in terms of their broader mandate, in particular in relation to pharmacovigilance and the promotion of rational medicines use.

As indicated, provincial medicines selection processes should be guided by the national STG/EMLs. However, cases may occur where a province requires access to specific medicines that are not on the national EML. This has especially been the case in those provinces with academic hospitals and specialist units, such as renal or cardiac transplant facilities. This process will be considerably aided by the publication of the Tertiary and Quaternary Care EML.

Provincial selection decisions may also result from upward motivation from the district and hospital PTCs. If a medicine that is required is not on the EML or the provincial formulary, it may be motivated for by a clinician, with the necessary supporting evidence. An alternative, which is also best managed by the provincial PTC, is to allow for access on a named-patient basis.

A 2011 qualitative study by the School of Public Health at the University of the Witwatersrand on the use of HTA in the selection and procurement of medicines showed that while the development, procurement and use of health technology falls within each province's jurisdiction, not every province has a formalised health technology policy.¹⁹ Those provinces that lacked HTA guidelines and policies believed this resulted in faulty procurement, which may lead to medicines service delivery problems.

Medicines selection under National Health Insurance

Centralised health technology assessment body

The availability of robust, locally applicable HTA will greatly assist in informing medicines selection processes both in the public and private sectors.

It has been widely recognised that a centralised process for HTA (that assesses clinical efficacy and effectiveness, health economics and budget impact) is required to address the shortage of skilled resources in the areas of clinical evaluations and health economics assessment. A centralised HTA process will also create a united viewpoint to guide healthcare policy and coverage decisions.

Institutions such as the National Institute for Health and Clinical Excellence (NICE) in the United Kingdom, the Canadian Agency for Drugs and Technology in Health (CADTH) in Canada and the Pharmaceutical Benefits Advisory Committee (PBAC) in Australia have become recognised as opinion leaders in the field of HTA. These institutions guide clinical decision making around the world.

As SA moves towards an NHI system, it is envisaged that a similar centralised process for HTA will be required. The Human Resources for Health SA strategy paper indicates that an "NDoH National Coordinating Centre for Clinical Excellence in Health and Health Care will be established".²⁰ The operations of the Centre will be located in various sites, which will include academic sites of excellence, the Medical Research Council, and the NDoH.

However, a central office will provide a coordinating function and bring together associations, professional groups, provincial departments of health and the academic community to define and oversee clinical quality professional health care.

The establishment of such an institution requires vision, drive and resources. The need for training and skilling resources in evidence-informed medicine and pharmacoeconomics is increasingly recognised. Steps towards addressing this shortcoming have been taken by various academic institutions. The Health Economics Unit at the University of Cape Town, for example, offers a certificate diploma and master's degree in health economics, while a master's degree in pharmacoeconomics was introduced by the University of KwaZulu-Natal in 2011. Related topics are also covered within certain post-graduate courses at other universities, such as the master's degrees in clinical epidemiology at the universities of Pretoria and Stellenbosch. In addition, basic training in evidence-based medicine and pharmacoeconomics is offered by various organisations and associations such as the Pharmaceutical Care Management Association of SA. Considerable involvement of all stakeholders and the political will to drive a process of coordinating a centralised HTA function are required for successful implementation and integration of these initiatives.

Medicines procurement – a shift towards centralisation

Medicines procurement in the public sector has been conducted under the auspices of the Coordinating Committee for the Provisioning of Medical Supplies (COMED) since 1988. However, while this structure has been hosted within the Department of Health, and has coordinated the efforts of the provinces and other participating departments (Correctional Services and Defence), the National Treasury has been responsible for awarding all contracts. Following reports of deterioration in medicines availability across the country, a Ministerial Task Team was established in 2009 to assess the state of medicines procurement in the public sector and make recommendations for procurement reforms. The Task Team favoured the strengthening of a more centralised role in the procurement of medicines, which included the establishment of a Central Procurement Agency (CPA). It was envisaged that the CPA might eventually migrate out of the NDoH and become an independent public entity responsible directly to the Minister of Health. Subsequent to this, support for the establishment of the CPA was secured in SA's Round 10 grant from the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) in 2010. The establishment of the CPA was approved by the National Health Council in 2011, with the Directorate Affordable Medicines (DAM) effectively becoming its core structure. A number of critical posts were filled, supported by funding from the Global Fund, which enabled the DAM to strengthen its infrastructure and resources so that it could start the management of pharmaceutical tenders independently of the National Treasury.

The ability and capacity of the NDoH to prepare, advertise, adjudicate, award and manage the relatively large national medicines tenders on its own was put to the test with the decision to take over management of tenders for three critical priority programmes (anti-tuberculosis, anti-infective and family planning medicines) in 2011. Technical assistance with the preparation of the

tender process was provided by partners such as the USAID-funded Strengthening Pharmaceutical Systems (SPS) programme managed by the MSH, in close collaboration with the Clinton HIV/AIDS Initiative (CHAI, now known as the Clinton Health Access Initiative).

It may be too early to judge the impact of the NDoH's taking over the management of medicines tenders from the National Treasury. There does appear to be consensus within the DAM and the provinces, though, that the NDoH is gradually achieving the required efficiencies in the tender process.

Being responsible for the management of its own tenders has given the NDoH the opportunity to take a broader view of the various functions in the supply chain and bring about linkages that should optimise scarce resources in the long run. Market intelligence is now applied for the first time in the tender process, with price adjustment applications being evaluated critically on the basis of global trends in API price increases and formulation costs. The option to conduct price negotiations with preferred bidders has been built into the special conditions of tender and price negotiations have resulted in additional savings on a number of contracts.

The NDoH has claimed significant savings in several tenders since it took over, compared to the previous tenders, as illustrated in Table 1 below. The savings have been calculated on the difference in the estimated cost implications, based on the quantities tendered for, between new and previous contract prices, for items that were awarded on both contracts.

These figures represent between 1% and 50% of the value of the same volume of items and a total saving of 27%. As the contracts were re-constituted (e.g. all antibiotics were grouped together, new specifications were drafted and items were removed), percentage savings on the total cost of the tenders cannot be meaningfully represented at this stage.

The re-organisation of the tender system at the central level has raised confidence levels in the DAM and led to expectations of considerable efficiency gains in the foreseeable future. This has to be attributed to the fact that the NDoH is in charge of the processes and is able to take responsibility for its actions and control the outcomes. Turn-around time of the tenders has been shortened from about nine months to as little as four months. The management of risk has also been brought closer to the department affected by the risk.

Medicines availability in the provinces

The delivery of healthcare services is a provincial competence. Thus the imposition of any reform that includes central control of the pharmaceutical budget and of the medicines distribution chain is bound to be met with resistance. This is expected even though the majority of provinces are struggling to provide a high quality pharmaceutical service.

Yet, indications exist that the DAM has managed to secure the cooperation of provinces in implementing measures intended to improve medicines supply chain management and processes. One such example is employment of the so-called "ARV monitors". In December 2009, following a request from the South African Government to the United States Government, the latter agreed to meet a portion of the two-year funding gap for ARVs by providing US\$ 120 million over a period of two years. This support was contingent on a number of conditions. One of these was that measures be put in place to build capacity within the national and provincial departments of health to strengthen logistics and forecasting systems. In response to USAID's request for USAID partners to support this initiative, the MSH-managed SPS programme placed technical advisors with appropriate pharmaceutical and logistics skills – and officially designated "ARV Monitors" in each of the provincial pharmaceutical depots and another at the NDoH. The agreement was that the posts would be supported for a period of 18 to 24 months by MSH. After this time the NDoH and the provinces would have the option of absorbing the posts into their staff establishments.

The ARV monitors reported on the availability of ARVs and tuberculosis medicines, vaccines, anti-malarial and tracer medicines at depots to the provincial authorities. Through the provincial authorities the monitors also reported to the NDoH. This monitoring process enabled the compilation of a national database on stock availability, supply challenges and usage patterns. Furthermore, the monitors were involved to a varying extent, depending on each province's situation, in monitoring facilities and assisted with appropriate supplies to facilities in cooperation with provincial staff. Stock-outs of ARVs in the provincial depots reportedly decreased from 12% countrywide when monitoring first started to 2.4% at the end of the two-year intervention. Forecasted requirements for the remaining year of the contract period have been much more accurately determined and communicated to suppliers.

Table 1: Savings achieved on current tenders compared to previous year

Tender number	Description	Nominal savings on previous tenders
HP01-2011TB	Tuberculosis Agents	R68 million
HP02-2011AI	Anti-infective Agents	R170 million
HP04-2012ONC	Oncology and Immunological Agents	R70 million
HP06-2012VP	Small Volume Parenteral and Insulin Devices	R69 million
HP07-2012DAI	Drops, Aerosols, Inhalers and Inhalants	R3 million
HP08-2012SSD	Semi-solid Dosage Forms	R4.5 million
HP09-2012SD	Solid Dosage Forms (tablets)	R105 million

Source: Zeeman, 2012.²¹

The ARV monitors, through their liaison with all the relevant stakeholders in the chain, have provided a valuable link between selection, procurement, distribution, clinical options and use. Their posts have been retained, with the majority of the incumbents being re-appointed with funds allocated by the Global Fund. This resource has the potential to achieve improved outcomes in all areas of medicines use and has to be seen as key to resolving forecasting problems for all classes of medicines in the pharmaceutical supply chain.

The litmus test of the efficacy of any public sector's pharmaceutical supply system is the availability of medicines in PHC facilities. Sadly, the reality is that stock-outs at this level are still widely reported. Monitoring of availability at primary care facilities remains a challenge that needs to be addressed at district and provincial levels. A key attribute of the ARV monitor arrangement was that monitors were sufficiently funded to allow them to travel regularly between the depot and the facilities, which included the PHC facilities. This is in stark contrast to the situation of the district pharmacists in many of the provinces, who are often restricted to providing only remote support from their offices owing to budgetary restrictions on their mobility. The sustainability of the impact of the presence of ARV monitors in the districts will hinge largely on their continued ability to pay regular physical visits to the facilities. In addition, their focused activities set the ARV monitors apart from the district pharmacists. Furthermore, with the piloting of PHC re-engineering and the deployment of district-based clinical specialist teams in selected districts the role pharmaceutical services will play remains largely undefined. The current experience of the monitors may inform the future role of pharmaceutical personnel in the NHI districts.

The role of the state in pharmaceutical manufacturing

The production of APIs in the country has been keenly debated by the Department of Trade and Industry (dti) over many years. In 2008, the dti commissioned an investigation into the local production of APIs for ARVs.²² This was followed by a feasibility study into API production in the country, in which the dti collaborated with the NDoH and the Department of Science and Technology.^b

According to the dti, the South African pharmaceutical industry is a key contributor to the country's Gross Domestic Product (GDP). In 2008/09 it spent R11.95 billion, which included R4.40 billion on salaries and wages, R1.35 billion on capital investment and R1.75 billion on research and development (which incorporated clinical research). The industry paid taxes of R2.35 billion. This consisted of R1.60 billion in income tax and R740 million in value added tax. The sector's spending on corporate social investment (CSI) was R640 million, with Roche's support of the PheloPhepa Train an example of such spending.²³

At the same time, though, the dti cautions that the country's pharmaceutical manufacturing base has been eroded; 37 plants reportedly closed down between 1995 and 2010 and resulted in the loss of 6 500 jobs.²³ This is perhaps indicative of global trends towards the concentration of pharmaceutical manufacturing in a limited number of settings. In addition, the medical products

sector (pharmaceuticals, medical diagnostics and medical devices) has become the fifth largest contributor to South Africa's imports burden. Imports of pharmaceuticals (excluding APIs) grew from R6.20 billion in 2002 to R15.96 billion in 2011. Pharmaceuticals in finished-dosage form account for 80% of the sector's total imports, growing at 12.5% p.a. over the past four years, from R7.30 billion in 2006 to R11.6 billion in 2010. On the API side, SA imports 95% of its API requirements, which includes all APIs for ARVs and antibiotics. Some have argued that this is an untenable situation, as SA has the world's largest HIV and AIDS burden and is accordingly the world's largest consumer of ARVs, yet continues to rely wholly on imports of ARVs for the support of its treatment programme.

The Walwyn Report of 2008 noted, however, that local production of APIs for ARVs would face stiff competition from Chinese and Indian manufacturers and that a local production facility would only survive if it received government support. It recommended the establishment of a public-private partnership (PPP) with a local manufacturer. It reasoned that such a PPP would be able to compete over the medium term, if the government provided support in terms of the required capital and the private sector partner transferred state-of-the-art process technology and manufacturing expertise.

A further feasibility study on the same subject was presented to Cabinet in 2010 and was, by all accounts, approved for implementation. A media statement issued in February 2012 announced the establishment of such a joint PPP venture, which involved the South African Government.²⁴

The potential success of this venture may be judged by carefully considering the Brazilian experience. The Government of Brazil, as one of the Latin American countries most affected by the HIV epidemic, pursued an aggressive HIV and AIDS strategy from the early 1990s. This included a mandatory ARV therapy programme through the public health system and the active promotion of the development of the Brazilian pharmaceutical industry, with state-owned laboratories part of this initiative. The provisions of the TRIPS Agreement^c were applied to enable engagement in aggressive price bargaining with multinational pharmaceutical manufacturers. Implementation of the Generics Act, approved in 1995, fostered competition among producers and facilitated the reduction of prices. A further effect of the Act was that it strengthened the local pharmaceutical industry and the network of 18 publicly owned laboratories operated by various government units and universities.²⁵

By 2006, 80% of all the medicines marketed in Brazil were locally produced and Brazilian companies accounted for 75% of the total sales value. In 2001, 63% of the ARVs were produced by local manufacturers. By 2006, 7 public laboratories produced multi-source versions of 8 of the 15 medicines used in ARV therapy.

Among the key success factors cited as contributing to the phenomenal growth of the Brazilian domestic pharmaceutical industry was the establishment of publicly supported institutions

b Personal Communication: A. Kudlinski, Department of Trade and Industry. September 6, 2011.

c The Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) is an international agreement administered by the World Trade Organization (WTO) that sets down minimum standards for many forms of intellectual property (IP) regulation as applied to nationals of other WTO Members. It was negotiated at the end of the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) in 1994. In terms of TRIPS, developing countries may introduce legislation that allows them to introduce compulsory licensing or any other provision leading to the reduction of medicines prices in the particular country, in the interests of making health care accessible.

for biomedical research and development, which led to increased production capability of government-owned pharmaceutical facilities. According to some data, two-thirds of research and development spending in Brazil came from the government, while only one-third was invested by the private sector. An additional factor was the promulgation in 2004 of legislation that encouraged more public-private cooperation by making it easier for public and private enterprises to share resources, raise capital and clarify intellectual property rights.

The abovementioned positive points notwithstanding, critics point out that the real 'secret' behind the high local contents and reduction of penetration of imported pharmaceuticals in Brazil is the promulgation of Federal Act No. 12.349 / 2010 "Public Procurement Law" (enacted 15 December 2010), which mandated the use of government procurement to stimulate the economy.²⁶ The Act established price preference for domestic products and services for all sectors of the economy (including pharmaceuticals) of up to 25% relative to imports. Imported finished pharmaceutical products are subject to customs duties from 15% to 17% in Brazil; in contrast South Africa imposes no duty on pharmaceuticals. Furthermore, while Brazil was successful in reverse-engineering technologies for ARV APIs such as stavudine, zidovudine, nevirapine and lamivudine in the early 2000s, it encountered technology barriers in its attempts to manufacture more advanced ARV APIs, such as efavirenz, emtricitabine, and lopinavir/ritonavir. Currently, Brazil imports most of its ARV APIs from India and China. Some experts maintain that technology barriers in the manufacture of advanced chemical APIs or biologics and vaccines are so high (as Brazil has learnt) that it is cheaper and safer to license a technology rather than develop it domestically.^d

While complete autonomy in relation to API production for ARVs is probably not unachievable, any progress in this regard will require the highest levels of political will and massive investment of resources. The Brazilian experience has demonstrated aptly that the road to self-sufficiency in the production of APIs does have potholes. In addition the achievement of the goal of reducing the country's trade deficit in the process of supporting the country's massive ART programme may have to be aided by the enactment of unpopular legislative measures. API production in the country may have to remain a longer-term goal that will not impact on medicines availability in the foreseeable future.

Conclusion and recommendations

This chapter has provided examples of aspects of the NDP that are currently implemented with some degree of success, especially as far as reducing the cost of medicines is concerned. Although the impact may not have been quantified in all the cases, considerable anecdotal evidence exists of the impact that many of the measures based on the NDP and implemented by government have had on medicines affordability.

The selection of medicines is considered key in ensuring equitable access to health care. The processes of selection may differ, depending on the sector (public or private) in SA. The application of the principles of evidence-based medicine, pharmacoeconomics and budget impact analysis, however, should serve as strong

criteria in the decision-making process and lead to effective medicines selection.

The selection of medicines requires a coherent approach. SA's move towards NHI should provide an opportunity to engage with all stakeholders to ensure a successful transition to a more centralised system.

In addition, overseas examples of the use of academic units with expertise in the fields of health economics, evidence-based medicine, critical appraisal and other HTA aspects provides lessons that can be drawn on in SA. A willingness and enthusiasm in the academic sector to engage in these processes should be strongly encouraged and fostered.

Conducting full HTAs in SA may be unnecessary, as information can be drawn from other countries and institutions, which have the relevant expertise. While the HTA needs of the private and public healthcare sectors may differ presently, these are likely to become more streamlined with the introduction of NHI.

Developments in medicines procurement in the public sector in the past few years or so would seem to indicate that the transfer of the management of pharmaceutical tenders to the NDoH may ultimately lead a more cost-effective system of medicines procurement compared to previous years.

The fully fledged establishment of the CPA, which would centralise control of the country's pharmaceutical budget, may have far-reaching Constitutional implications.

None of the measures implemented in the medicines supply chain seem to have a positive impact on medicines availability at PHC level. As indicated in this chapter, far more effort needs to be made at district level in this regard.

The move towards the production of APIs for the production of ARVs in the country is a positive one, but the fruits of such a venture, if eventually successful, may not be enjoyed in the foreseeable future. Also, little reason exists for believing that the establishment of a state-owned pharmaceutical manufacturing company will lead to a reduction of medicines prices.

Implementation of the country's NDP was not accompanied by a monitoring and evaluation plan that would have allowed for a systematic assessment of its impact. Some clear benefits have emerged in some areas, such as in pricing and the establishment of the NEMLC and PTCs to oversee medicines selection and rational use. However, a comprehensive picture of the impact of the implementation of the NDP can only be gained through a robust review process. Such a review would also present an opportunity for the country's pharmaceutical services to be realigned and re-engineered for NHI.

d Personal Communication: A. Kudlinski, Department of Trade and Industry. October 11, 2012.

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Emerging Public Health Practitioner Awards



The Language Barrier: The overlooked challenge to equitable health care

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EMERGING PUBLIC HEALTH PRACTITIONER AWARD

This chapter examines the effects of language barriers on the access of patients and communities to quality health care. It also looks at communication challenges experienced by health professionals that provide this care. Using a case study of a rural hospital, the chapter highlights some of the challenges posed by the language barrier and explores current methods that English-speaking health professionals at this hospital use to overcome these difficulties.

The case study findings indicate that the language barrier decreases work efficiency and the provision of holistic treatment. It makes communication time consuming, which increases frustration levels and decreases empathy, approachability and confidentiality. Current methods for overcoming problems include the use of untrained and ineffective interpreters – usually overworked nurses; linguistic codeswitching; and the use of a selection of key isiXhosa vocabulary. These methods have many drawbacks and are not suitable or sustainable.

Recommendations for improving communication include the promotion of a culture of multilingualism, which includes language education as a part of professional development and the employment of trained interpreters. For multilingualism to occur, more research needs to be conducted, and the political will to address this problem must be demonstrated. Overcoming the language barrier needs to be prioritised and commitment must be made to implementing strategies that provide a multilingual patient base with a multilingual healthcare service.

Commitment must be made to implementing strategies that provide a multilingual patient base with a multilingual healthcare service.

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Introduction

Good communication has long been acknowledged as the cornerstone of the health professional-patient relationship and plays an important role in the quality of healthcare delivery.¹ A lack of proficiency in a common language, however, decreases the quality of verbal communication between people. This lack of linguistic mutuality means that language becomes a limiting barrier – and, like any barrier, the language barrier impedes and obstructs effective communication.

In South Africa (SA) the language barrier continues to compromise a large proportion of the population's quality of and access to healthcare services. This compromising of quality and access extends beyond the scope of the language barrier itself. It reflects vast and interlinking divisions in South African society forged by disparate educational access, divergent socio-cultural backgrounds and various historical legacies.

Health care in this country has many challenges to overcome. A lack of material and human resources, ineffective management of these resources, and the HIV epidemic are some of the complex and diverse challenges that SA is currently facing. The provision of a monolingual health service to a multilingual society is an additional and yet commonly overlooked challenge – especially in a country where diversity is not only constitutionally acknowledged but part of a public "rainbow nation" discourse. Using a case study of Madwaleni, a rural hospital in the Eastern Cape, this chapter highlights some of the challenges posed by the language barrier and explores current methods that English-speaking health professionals at this institution use to overcome these difficulties.

The effects of the language barrier on health care

The true depth of the impact of the language barrier is often disregarded by health practitioners, administrators and policy makers. The literature reviewed showed that the problem is widespread and not only limited to peripheral rural areas. In a 2006 study conducted by Levin of a large, urban paediatric hospital, a survey showed that only 6% of medical interviews were conducted (wholly or partly) in the patients' home language.² Patients are generally interviewed in a second or third language despite the fact that they prefer to be consulted in their own language.³ The Patients' Rights Charter provides that patients have access to health care and the right to health information that includes the availability of health services and how best to use such services and that such information shall be in the language understood by the patient.⁴

This sentiment is echoed in the Bill of Rights, which states that: "everyone has the right to have access to health services".⁵ The language barrier is simply that: a barrier to the accessing of health care. English remains the dominant language used officially and unofficially in healthcare services. According to the Constitution (Act 108 of 1996), though, SA has 11 official languages, with each language having an equal standing in the eyes of the law. Furthermore, the Constitution states that:

recognising the historically diminished use and status of the indigenous languages of our people, the state must take practical and positive measures to elevate the status and advance the use of these languages.

The practical focus of healthcare reform emphasises structural, administrative and resource shortages. The importance of language, especially in doctor-patient communication, is ignored. According to Levin's 2006 study, "language and cultural barriers were cited by more parents [of patients] as a major barrier to health care than structural and socioeconomic barriers".²

While medical science does have an objective and examinable component, the importance of communication is irrefutable. In an article reporting on a 2010 study by Deumert, a doctor is cited as explaining:

I can put my stethoscope [on a chest] but I will be guided by what my patient has told me. If the patient, for instance, was taking, let's say TB treatment, and she didn't finish the treatment, I won't hear it from the stethoscope.⁶

Along with the negative impact of the language barrier on health professionals shown by the case study findings described below, the consequences for patients can be devastating. According to Jacobs et al., people with a limited English proficiency are:

less likely to have a regular source of primary care and are less likely to receive preventive care. They also are less satisfied with the care that they do receive..., more likely to report overall problems with care... [and] may be at increased risk of experiencing medical errors.⁷

In an era of patient-centred care, patients continue to have a reduced ability to participate in decision making and dialogue, which results in a power shift in favour of the healthcare practitioner.⁸ The link between English proficiency and educational attainment in post-apartheid SA means that previously disadvantaged groups of people continue to be marginalised and to experience this power imbalance. In many cases, patients may even blame themselves for their own linguistic inability rather than hold health professionals accountable for the decreased quality of care.²

The inability to communicate can be a traumatic, fearful experience – one that eliminates empathy and humanity from the health services provided. Schlemmer and Mash in 2006 recorded this account from a health professional:

the other day a child died, and the mom stands there, and we literally sit and wait for half an hour for an interpreter, so that I can talk to this mother about her child that died.⁸

Studies have shown that miscommunication caused by the language barrier results in increased patient avoidance behaviour (which may result in later presentation of disease) and adds to the uncertainty and emotional stress experienced by patients.^{6,9} Miscommunication can result in increased errors (potentially life threatening) both in diagnosis and management. Thus patients experience decreased satisfaction with services and are less inclined to adhere to and comply with treatment and they also receive less health education.^{6,10}

Language cannot be isolated from culture. Cultural competency by health practitioners is important and facilitates a greater respect from patients. For example, doctors need to understand that not questioning a doctor can be perceived as a sign of respect in some cultures even if the patient has not understood what the doctor has said.⁸ Consultations are the point of contact between two people

– patient and doctor – who both view the world through different cultural lenses. These different world views can ultimately affect the quality of consultations.¹¹

Additionally, disciplines such as mental health, which rely heavily on communication and cultural competence for diagnosis and management, are more vulnerable to errors or neglect.¹¹

Madwaleni Hospital: a case study

Madwaleni is a 180-bed hospital in the Mbashe sub-district within the greater district of Amathole in the Eastern Cape. The hospital services the entire population of 262 000 people, most of whom are mother-tongue (often exclusively) isiXhosa speakers. With this largely isiXhosa-speaking population in Madwaleni, the resident English-speaking doctors, physiotherapist and occupational therapist experience a language barrier that prevents them from providing the best possible care.

As with any problem, the non-Xhosa-speaking staff of Madwaleni adapt and find workable solutions for communicating with their patients; the most common solution is the use of Xhosa-speaking staff, often nursing staff, as interpreters. This is an effective short-term method but more sustainable and suitable solutions are necessary to provide more efficient care.

As part of the Madwaleni case study, qualitative interviews were conducted with health professionals during December 2011. Seven doctors, one occupational therapist and one physiotherapist were formally interviewed to find out what impact communication problems had on their work and what they thought were possible solutions.

Language difficulties in Madwaleni Hospital

Difficulties identified by doctors that arose from a lack of understanding isiXhosa included the inability to ascertain the main complaint or obtain a coherent past medical history and the inability to identify malingering and psycho-social problems. Difficulties arising from an inability to speak isiXhosa included a decrease in the ability to be empathetic, kind and approachable and to resolve psycho-social problems and a decrease in adherence counselling and patient education. One doctor described a vast distance between doctors and patients, which he described as, “health care taking place across a barrier”.

Difficulties that arose from cultural differences were also brought up in the interviews. Obtaining informed consent and maintaining patient confidentiality were mentioned as often unavoidably less practised because of these differences. However, while language was cited as a problem, health professionals interviewed saw structural problems, policies, leadership, and organisational culture and infrastructure issues as greater barriers to effective care.

Some of the doctors who were interviewed felt that a form of “paternalistic medicine” was practised at the hospital as a result of the language barrier. They suggested that patients didn’t seem to mind this practice as they were mostly silent, never demanded anything and rarely asked questions. This behaviour may be a result of language or cultural differences but may be symptomatic of a greater structural disempowerment. The silence also affected the patients’ understanding of their disease, consent and treatment adherence.

Doctors experienced a stark difference in treating English-speaking patients. They found that bonding between patient and doctor increased and that the doctor took more time to explain to the patient the disease, the prognosis and the treatment plans – which, undoubtedly, affects the quality of treatment.

In summary, the language barrier decreased work efficiency and the provision of holistic treatment; it increased frustration levels, was time consuming and decreased empathy and approachability. The experiences of these health professionals correlate with other health professionals’ experiences of the language barrier cited in other research^{6,8,13} and formed an almost singular collective experience of this language obstacle.

Methods of overcoming the language barrier at Madwaleni Hospital

One of the measures used to overcome the language barrier is a reliance on non-trained interpreters. The health professionals interviewed reported relying on interpreters, who were often professional staff, junior or student nurses, family members of the patients (often children) and auxiliary staff.

Typically, a communication barrier often exists between doctor and interpreter and between interpreter and patient. This perpetuates the metaphorical ‘broken telephone’ phenomenon that is reportedly common at Madwaleni. Doctors interviewed stated that a language barrier also exists between themselves and some nurses. One doctor recounted how he had asked a nurse to interpret “Is the patient having difficulty breathing?” The nurse had replied, “Yes, she is breathing.”

Doctors agreed that the efficiency and quality of communication depended on the interpreter. Junior nurses or student nurses often had acquired a less proficient use of English. Some interpreters filled in gaps with their own knowledge. One doctor suggested they could see more patients when they did not use an interpreter – which points to the time-consuming nature of translating.

Most health professionals interviewed felt that a simple question from them to a patient would lead to the nurse and patient having a five-minute-long conversation, with the only feedback from the nurse being either “yes” or “no”. Doctors felt that this led to a subversive disconnect between patient and doctor and some doctors reported writing on patient charts while the nurse and patient were talking.

The examples provided above illustrate the potential disadvantages of using interpreters. In addition, the health professionals acknowledged that the use of interpreters can make one lazy and prevent a faster acquisition of the language of the patients.

Interpreters do, however, serve as cultural mediators and can pick up on the semantic subtleties and underlying tones of patient discourse. At Madwaleni, it was reported that interpreters facilitate a greater reflection on culture-specific topics. Currently they are the best available communication method and for this reason are valuable.

Another method of overcoming the language barrier is codeswitching. Codeswitching is a linguistic phenomenon where speakers change between two languages in a single sentence or conversation. Doctors and rehabilitation staff have picked up some essential words that allow them to practise some independence in the absence of the ad hoc interpreters. While this is a drop in

the linguistic ocean, it provides some direct communication with the patient that allows for bonding and trust to develop between patient and doctor. It also allows for more rapid communication and is a practical tool for transferring instructions quickly.

Common phrases used include “buya date” (date of return), “you must go there ngomso (tomorrow)” and “kubuhlungu?” (is there pain?) or “uxolo” (sorry). “Hamba to the ifestile ngoku” is a common phrase that indicates that patients must go to the ‘window’ – which is the pharmacy. Most English-speaking health professionals at Madwaleni know a fair number of anatomical words – for example: “indlebe” (ears), “intloko” (head) and “amadolo” (knees). They have also mastered some action command verbs: “goba”, “lula”, “vala”, “vula”, “phefumla”. Doctors were observed to call out into the waiting room of the outpatient department “olungileyo” (next) or “omnye” (one) to signal that the next patient must enter. Additionally, most doctors changed their accents when speaking to patients and used simple English in the hope of transferring meaning.

Towards future solutions

Kaplan, Greenfield and Ware in a 1989 assessment of the effects of physician-patient interactions on the outcomes of chronic disease noted three aspects of communication that had a critical link with patients’ health outcomes: the amount of information exchanged between the patient and physician, the rapport between the patient and physician and, lastly, the patient’s control of the dialogue.¹² Speaking and understanding the language of the patient allow for this and can be developed through effective translation and/or increasing the bilingual workforce. Additionally cultural competence is necessary for providing appropriate care in the language of the patient and developing rapport, understanding and respect.

Effective translation and interpretation

The five main models of interpreting are:¹⁰

- approximate-interpreting model – ad hoc interpretation from anyone available that can speak the language;
- tele-active model – using telephones or computerised interpretation devices;
- bilingual worker model – hiring of clinicians that have language skills;
- volunteer interpreter pool model – hiring interpreters and translators on an as-needed basis; and
- staff interpreter model – formally trained interpreters that are part of the clinical staff.

The staff interpreter model involves employing dedicated trained interpreters. This tackles the problem of the 11 official languages and varieties of cultures that exist in contemporary SA. Some doctors at Madwaleni preferred the idea of medically trained interpreters – which would give the interpreter background knowledge. Others preferred the idea of an interpreter with no medical knowledge – which would mean that the interpreter would repeat exactly what the doctor said.

Language translation is complex and training is necessary as bilingualism does not always equal or result in effective translation. To convey the true meaning and the nuances of a language, the interpreter may not always translate the language directly.

Additionally, certain words may not be easy to translate into another language as Swartz illustrates:¹³

A Xhosa-speaking psychologist translated the word “sad” as *khatazekile*. On back translation by two senior students of African languages, *khatazekile* was translated as “worried”. Sadness and worry have, from a psychiatric point of view, very different implications for diagnosis and treatment.

A 2010 study found that the use of professionally trained medical interpreters improved “communication (e.g. errors and comprehension), utilisation (of health services), clinical outcomes, and satisfaction with care for both Low-English proficiency (LEP) patients and health care practitioners.”¹⁰ Interpreters may increase the reception of preventive services, physician visits and adherence, which increase patient access to primary care.⁷

An interpreter inevitably becomes an intermediary in the doctor-patient relationship and this can have a negative impact on the communication between the doctor and patient.⁹ Interpreting staff may be frequently unavailable or may insert their own values and views into the conversation.³ In some cases interpreters have been shown to make many errors in translating and this affects patient care. Nurses particularly have been shown to be inaccurate interpreters.^{2,14} Training nurses to be interpreters and equipping them with the skills to translate may be a useful strategy for professionalising language mediation in the South African context – but the issue is complex, as nurses are already overworked and health facilities understaffed.

The use of family members (often small children), cleaners, administrative staff, other patients or any ad hoc bilingual person is not ideal. It affects patients’ confidentiality.⁸ These interpreters are unlikely to understand medical terminology, may struggle to break bad news to patients and translate and interpret sensitive issues and may have conflicting agendas or priorities.¹⁵ Neither are they counsellors and are not accountable legally for any mistakes or breaches of confidentiality.

The cost of hiring interpreters is an important consideration but the cost of not using interpreters may be even greater.⁷ Interpreter services have been shown to lower costs by decreasing the use of diagnostic testing or reducing post-emergency department visits.¹⁶ The short-term cost may increase as primary and preventive medicine increases in use – but over the long term this could see a possible reduction in cost, morbidity and mortality. The cost may also be overestimated. In recommendations to a study conducted in 2008, Deumert estimated that “200 interpreters would be sufficient to cover all the 34 public hospitals in the Western Cape”.⁶

Ultimately no single model exists that would provide the best method of translation for low-resource settings such as those found in SA.

Developing a culture of multilingualism – the bilingual worker model

The ideal is for the health service to employ health professionals who are already culturally and linguistically capable. Health professionals who would be proficient in the language of their patients should be identified and recruited. The already short-staffed nature of the health service prevents this but language-sensitive posting should be looked into.¹

If mother-tongue speakers are not available, health professionals must learn to speak the language of the majority of their patients. The Faculty of Health Sciences at the University of Cape Town is attempting to achieve this by transforming its health sciences undergraduate curriculum:

The curriculum design principles of inclusiveness, participation and social responsiveness mirror the primary healthcare (PHC) approach. Furthermore, a client/patient-centred approach that strengthens inclusivity and participation has been given impetus with the integration of two of the indigenous languages [isiXhosa and Afrikaans], most frequently spoken in the Western Cape, and cultural competences into all curricula.¹⁷

The diversity of languages in SA may dictate that specific competency in every language cannot be prepared for in tertiary institutions. Competence in the language of future patients could, however, become a form of professional development or part of in-service training. In Schlemmer and Mash's 2006 study, health professionals were shown to consider this:

As the doctors and nurses in this study requested, they should also be offered training in basic isiXhosa. Although language acquisition as an adult is not easy the idea is not to become bilingual in [isi]Xhosa, but rather to create sufficient basic understanding of medical isiXhosa and respect for the other's culture.⁸

Additionally, as a starting point, medical institutions could provide short word lists, which include salutations and medical vocabulary.² While language acquisition is a difficult and complex process, greetings and pronunciation of patients' names should be seen as absolute necessities. At Madwaleni, self-taught vocabulary allowed for independence from interpreters and increased direct interaction with the patient. But this was felt to be no substitution for proper communication. This finding confirms the findings of other research. For example, a doctor interviewed in the Deumert 2010 study explained how rudimentary communication contradicts the "essentials" of medical practice emphasised during training:

A lot of the time a patient arrives, they are breathing heavily, so you think that it's probably a respiratory problem, or a cardiac problem, and you want to ask them are they coughing, and you know the word is *khohlela* in isiXhosa, but more than that, you can't really get. You want to ask, are you coughing? Is it productive? Is it painful when you cough? Is blood mixed in, in the cough? You know, there is a problem, I mean, every professor of medicine will tell you three-quarters of your diagnosis comes from the history. And that is verbal.⁶

While many doctors do show an interest in learning the language of their patients, the argument against health professionals' learning of language is centred on the time-consuming nature of language acquisition over and above an already stressful workload. Additionally, doctors at Madwaleni explained that there were no role models or examples of people who had learned isiXhosa at that hospital and that the status quo of using nurses as interpreters was an easy habit to slip into. This may not be the global norm. For example renowned scholars Antia and Bertin noted in their 2004 Nigerian study: "irrespective of their home language, [practitioners] quickly acquired the languages of their patients."¹

A counter argument to the need for developing multilingual practitioners may be that patients can learn English – or acquire enough English to get by in a hospital setting. English as the *lingua franca* is viewed as a cost-effective and simple response to SA's cultural and linguistic diversity and takes away the responsibility for learning a new language from health providers.⁶ Cultural and linguistic marginalisation, with an emphasis on English and Afrikaans as the languages of operation, echoes pre-1994 experiences and can damage cultural diversity as a hegemonic Western culture assumes dominance. This will inevitably – as in fact it already does – marginalise those who may not be able to acquire English easily: older patients and people with low socio-economic circumstances or poor inter-cultural and linguistic exposure (characteristic of rural areas).

The National Health Act (Act 61 of 2003)¹⁸ puts the responsibility on the healthcare provider to provide multilingual health care but does not point to the methods that can accomplish this:

The healthcare provider concerned must, where possible, inform the user as contemplated in subsection (1) in a language that the user understands and in a manner which takes into account the user's level of literacy.¹⁸

This does not mean that patients should not take control of their own health. Patient empowerment and education must occur in institutions.

The language barrier is not new. Historically, this problem has always existed, but health professionals stayed much longer at one hospital – especially in the rural context. Increasing staff retention at hospitals, in itself, logically promotes the long-term acquisition of the language/s of that region. At the time the case study was conducted at the end of 2011 most health professionals at Madwaleni had been there for not more than one or two years. With the re-engineering of the health system long-term employment at one institution may be the single most sustainable method of eradicating the language barrier between doctor and patient.

Cultural competence

The "explanatory model approach" is an effective starting point for addressing a patient's personal and cultural experience of illness. Using this framework, as outlined by Kleinman and Benson allows one to gain a better understanding of a patient's experience of health.¹¹ The framework also takes into consideration the pressures and time constraints of the modern hospital environment.

It involves the practitioner asking the patient:

- what do you call this problem?
- what do you believe is the cause of this problem?
- what course do you expect it to take?
- how serious is it?
- what do you think this problem does inside your body?
- how does it affect your body and your mind?
- what do you most fear about this condition? and
- what do you most fear about the treatment?

Policy implications and recommendations

Primary health care re-engineering is centred on health promotion, prevention and community involvement, none of which can occur without an acknowledgement of the multilingual nature of South African society. Promotion and prevention cannot begin to succeed if there is no dialogue. The institutional and structural silencing of patients' and communities' non-English voices prevents community involvement.

The Core Standards¹⁹ – a framework created by the Department of Health, for the assessment of health establishments – make no mention of the language barrier or even acknowledges it as a challenge to service-delivery quality. The Negotiated Service Delivery Agreement (NSDA), an intersectoral government agreement aimed at “a long and healthy life for all South Africans”,²⁰ describes ways to increase patient care and satisfaction – but it too does not mention language. This ultimately demonstrates a lack of recognition or interest in the importance of language.

The Patients' Rights Charter⁴ and the National Health Act (Act 61 of 2003)¹⁸ mention that services must be in a language that is understandable but this mere mention is perfunctory rather than enforced and prioritised in policy. A policy-implementation gap still exists and this is partially related to the fact that no mention is made of the strategies needed to overcome the language barrier in health services.

A directed and focused policy needs to be developed that engages with appropriate methods of overcoming the language barrier. For this to occur, first, combating the language barrier needs to be prioritised. The data discussed in this chapter point to the validity of this prioritisation. Second, more research needs to be conducted in the South African context to develop evidence-informed effective solutions. Third, increased awareness and discourse around the language problem must be cultivated. Last, these solutions or interventions need to be communicated to stakeholders and all involved should understand the need for these interventions.

Conclusion

The Bill of Rights provides that “everyone has the right to have access to health services”⁵ and states that the language barrier is simply that: a barrier to the accessing of health care. Provision of services in a patient's own language is an integral part of the quality of care and “getting language right” has been shown to result in positive outcomes for all stakeholders – patients, doctors and administrators. However, the problem needs to be prioritised and commitment to implementation strategies must occur.

The answer to overcoming the language barrier in hospitals in SA may be a combination of all the strategies discussed in this chapter and some may be more applicable in certain districts than in others. The data are compelling and the importance of doctor-patient communication cannot be ignored. Yet there are perceived undercurrents of chronic resistance, lack of interest and claims of irrelevance. The solution to addressing the communication barrier begins with an acknowledgment of its existence and strong political will to address the problem at all levels. In the overhauling of the healthcare system, now is the time to provide a multilingual society with multilingual healthcare.

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Barriers to the Implementation of Tuberculosis Infection Control among South African Healthcare Workers

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EMERGING PUBLIC HEALTH PRACTITIONER AWARD

This chapter provides an overview of health system factors that influence health worker performance in implementing TB infection control (TBIC) in primary care clinics at district level. Research in the form of a case study was conducted among professional and lay healthcare workers (HCWs) to assess barriers to implementation of TBIC in two South African primary care clinics with high TB prevalence.

Barriers and enablers to TBIC implementation were linked with health systems and HCW motivation. Some of the barriers identified were inadequate HCW training on TBIC, a non-responsive compensation policy and the perception that a busy clinic schedule leaves no time for TBIC implementation. Resource availability, adequate human resources, supervision and leadership characterised by delegation enabled HCWs to implement TBIC.

Lessons drawn from this chapter could influence health policy reform and inform managers about how to improve health worker performance as regards safety in high-risk settings.

Some of the barriers identified were inadequate training on tuberculosis infection control, a non-responsive compensation policy and the perception that a busy clinic schedule leaves no time for tuberculosis infection control implementation.

Introduction

Healthcare workers (HCWs) and patients are at risk of acquiring tuberculosis (TB) infection in healthcare facilities.¹ Such risk characterises TB as a dual public health threat – first, as a communicable disease and, second, as an occupational health hazard. Overall TB prevalence among HCWs in South Africa (SA) was 5% in 2009 while HIV prevalence was approximately 16% in 2002.^{2,3} HIV co-infection and TB drug resistance (DR-TB) worsen the overall problem of TB in South Africa.⁴ The burden of TB disease driven by a high HIV prevalence and increased vulnerability to TB increases the likelihood and significance of healthcare-associated TB transmission.⁵⁻⁷ “Healthcare-associated infections” refers to infections that are acquired by staff or users of health services within healthcare facilities.⁸ The risk of healthcare-associated TB has been recognised in healthcare settings worldwide.^{9,10} In SA, healthcare-associated infection is particularly an issue in communities with both a high drug-resistant TB prevalence and HIV prevalence.¹¹⁻¹³

Khayelitsha is a poor urban township located 40 kilometres from Cape Town, and has an estimated population of 500 000.¹⁴ Within the South African health system, the district or sub-district level, such as Khayelitsha, is the primary level of care and first point of call for health service utilisation. There are ten primary care clinics in Khayelitsha and each of these clinics has been sensitised to TB Infection Control (TBIC) and have commenced implementation of such an initiative.¹⁵ As the largest township in the Western Cape, Khayelitsha has one of the highest TB and HIV co-infection rates in SA and globally, with a TB case notification rate of 1 158 per 100 000 per year.¹⁶ About 70% of all TB patients are also HIV-infected.¹⁷ One of the strategies aimed at reducing the TB burden in Khayelitsha is to prioritise TBIC in health facilities to limit nosocomial transmission. Although measures of TBIC have been implemented in all Khayelitsha clinics, such measures are difficult for HCWs to maintain.¹⁸ This study explores barriers to TBIC implementation among HCWs in two primary care clinics in Khayelitsha.

TBIC is part of a broad range of Infection Prevention and Control (IPC) measures recommended by the World Health Organization (WHO) and adopted locally in SA.¹⁹⁻²¹ Provisions for IPC in SA are documented in the Occupational Safety and Health Act (Act 85 of 1993)²² and Compensation for Occupational Injuries and Diseases Act (Act 130 of 1993).²³ The WHO recommends TBIC as one of the three strategies for reducing the burden of TB in HIV-prevalent settings.²⁴ These strategies are: isoniazid preventive treatment, intensified case finding and infection control.²⁵

TBIC is a combination of measures used as part of a holistic approach to effectively reduce the risk of TB transmission within crowded settings, including healthcare facilities. TBIC comprises three categories of measures that are hierarchical but usually implemented simultaneously to reduce the risk of healthcare associated TB. These measures are administrative controls, environmental controls and the use of personal protective equipment (PPE). Administrative controls are the most prioritised of the three, described as the “first line of defence” against TB transmission in healthcare facilities because of their potential for removing infectious risk through prompt diagnosis and treatment.²⁶ They include prompt identification of clients with TB symptoms, placing them on treatment and minimising time spent in a health facility. Other components of administrative controls include staff training,

establishing infection control committees, cough etiquette, health education and the use of paper masks by patients. Environmental control helps to reduce the number of infectious droplets in the air through controlling the direction of airflow and natural ventilation (i.e. keeping windows open) or mechanical ventilation (i.e. installation of vents and wind-driven air extractor turbines). The third measure of TBIC is the correct and consistent use of PPE (e.g. N95 respirators, which contain filters that prevent wearers from inhaling the TB bacilli).²⁷ Implementing PPE for TBIC is ranked third because it is regarded as a last resort that complements administrative and environmental control measures. Whereas other measures prevent more than one person from becoming infected with TB, PPE protects only the wearer. Although there is little direct evidence, theory and mathematical modelling suggest that the consistent implementation of the trio of TBIC measures can significantly reduce TB transmission within healthcare facilities.^{7,10,13} HCWs are seen as the front-line implementers of TBIC in healthcare facilities and therefore play a vital role in the effective and consistent implementation process.

Since HCWs are an essential part of the health system that implement health policies within healthcare facilities, understanding what motivates them to implement TBIC is crucial for identifying barriers to implementation.

This chapter reports on a study conducted with healthcare workers from two clinics in Khayelitsha (Clinic A and Clinic B). Data was collected by direct observation of HCWs implementing TBIC in the clinics and key informant interviews among facility managers and a sub-district health representative (n=3), semi-structured interviews among professional HCWs (n=7) and focus group discussions among lay healthcare workers (n=3). An observational grid and interview guidelines were developed as data collection instruments.

Enablers of TBIC implementation among HCWs

This section outlines factors that enhanced TBIC implementation among HCWs in the two clinics surveyed.

Resource availability

Professional and lay HCWs are more likely to implement TBIC when resources are provided in the form of infrastructure, human resources and consumables (e.g. N95 and paper mask). Professional HCWs mentioned the crucial role of human resource availability in TBIC practice, especially with regard to reduced workload per staff member, which left more time to implement TBIC.

Last year, we asked for more staff. We are happy because they have recruited more people, now we can listen to TBIC. We have more people and more time to implement.

(Key informant one – Professional HCW)

In terms of resources provided by the health system (potentially enabling factors), both professional and lay HCWs in both clinics described respirators and paper masks as “generally available”. Health system support characterised by leadership, resource availability and operational policies enabled HCWs to implement TBIC. This finding is in line with previous research that has shown how organisational support and commitment to health workers’ safety strongly motivates HCWs to implement TBIC.²⁸

Leadership by delegation

As a further administrative control measure, a facility manager assigned responsibility for infection control (IC) to a professional HCW. Such delegation, combined with ongoing supervision, seemed to have underlined TBIC as a priority in Clinic B compared to Clinic A where an infection control committee is yet to be functional.

There is someone I have given the portfolio to who is championing IC. He is the one doing an IC audit on a monthly basis and then we discuss it with the general assistants.

(Key informant two – Professional HCW)

Supervision

It was observed that HCWs in Clinic B used respirators more consistently compared to those in Clinic A. A key informant interview revealed that in Clinic B, the facility manager who had earlier observed the inconsistent use of respirators among HCWs organised a fit test of N95 respirators to encourage sustained use of respirators among staff. The fit test enabled HCWs to use respirators:

Last year, we had fit testing sessions. I asked the TB/HIV coordinator to come and do a fit test for all the staff working in the TB room. So now it fits them properly.

(Key informant three – Professional HCW)

Although HCWs' discomfort while they are using respirators is something the health system may not be able to address, fit tests can minimise the discomfort by helping HCWs to identify the most suitable respirators.

After the fit tests, one of the HCWs working in the TB unit was seen not wearing a respirator. The manager then requested a signed document stating the HCW was not willing to use the PPE provided by the clinic. This HCW was seen wearing a respirator during later observations. HCWs need to be supervised and constantly reminded about maintaining TBIC practices in clinics. Evidence suggests that if each clinic had a dedicated infection control officer, daily TBIC implementation would be likely to be more effective. However, a setback in hiring an infection control officer is the over-reliance of HCWs on the individual, whereas TBIC should be the collective responsibility of professional and lay HCWs. The experience of the head of the infection control committee in one of the clinics referred to the tendency of HCWs to avoid taking responsibility for infection control once a person has been assigned to champion the implementation process in clinics.

Collective practice

HCWs tend to be influenced by the social norm when colleagues wear PPE. One HCW declared:

In this particular clinic, I see that everybody wears a mask more than in other clinics which is encouraging....I think when you are working with people who are conscious of IC [infection control], it makes you more conscious of IC.

(Key informant four – Professional HCW)

Similar to our findings, another recent South African study associated support from colleagues with the implementation of TBIC among HCWs.²⁹ In-service training could be a potential platform to garner support for implementing TBIC in clinics. After in-service training HCWs are more likely to remind each other about sustaining the TBIC practice they have learnt. Implementation challenges can be shared and resolved through active infection control within clinics.

Screening for TB

On HCW screening for TB, the health system makes diagnostic services readily available to staff. TB screening is voluntary and usually initiated by HCWs. When asked if TB screening is available to HCWs, one of the interviewees responded:

We are allowed to whenever you feel like. If I feel like I have a cough and want to have an x-ray because maybe I am suspecting TB, that is in place at work.

(Key informant five – Professional HCW)

Such provision of TB screening services to HCWs is an enabling factor for TBIC practice. If HCWs are provided with needed services that enhance their health such as screening for TB, they are more likely to feel supported by the health system and implement TBIC. If screening services are unavailable, HCWs are likely to feel demotivated.

Barriers to TBIC implementation among HCWs

Identified obstacles to implementing TBIC among healthcare workers are summarised in this section.

Uncomfortable respirators

Despite the fear and high risk attributed to TB, HCWs admitted they were not inclined to comply with PPE requirements due to the discomfort and suffocating nature of the respirators provided. They mentioned difficulty in breathing aggravated by personal health challenges, pregnancy or other conditions.

The challenge and demotivator is difficulty in breathing using the N95.

(Key informant six – Professional HCW)

Non-proactive use of respirators

An important finding is the reactive manner in which HCWs use respirators by only wearing them after they know the TB status of a patient.

I only wear mask when I know a patient has been diagnosed. It is suffocating, a communication barrier and feels hot.

(Key informant seven – Professional HCW)

This non-proactive use of respirators reflects a lack of understanding as to who is more likely to be infectious. Undiagnosed and untreated TB cases that will be infectious are mostly found in the waiting areas of clinics. Wearing respirators for known TB cases only is therefore a hindrance to consistent TBIC implementation among HCWs.

HCW perception of TB concentration in certain clinic sections

Lay HCWs not working in the area of TB did not see a need to use PPE because they did not perceive themselves at high risk of acquiring TB. In Clinic A, lay HCWs (assisting the TB team) did not use respirators while attending to patients because of their perceived low risk of contracting TB. Further probing on the possible reasons for this perceived low risk, revealed that HCWs associate consistent use of respirators with HCWs working in TB sections or working with diagnosed TB patients. As far as they are concerned, TB is concentrated in one section of the clinic – the TB section.

Therefore, the perception is that spending a few minutes in the TB room does not predispose HCWs to TB infection as stated by these respondents:

I don't work in TB room full-time, just helping out so I don't need to wear a mask.

(Key informant eight – Lay HCW)

When I was working in TB room, I used to wear a respirator but it choked me. I feel very uncomfortable, but now I no longer work there so I don't have to use it.

(Key informant nine – Professional HCW)

The perception that an airborne infection such as TB is restricted to the TB section of the clinic is a barrier to TBIC implementation among HCWs that needs to be addressed during staff meetings. Information, Education and Communication posters should be displayed in all sections of the clinic. For example, a poster that reads: "TB somewhere in the clinic is TB everywhere in the clinic. Are you protecting yourself?" could be posted in each section of the clinic to inform HCWs and clients.

Non-responsive compensation policy

Another issue raised by HCWs was the non-responsive compensation policy, should they ever get active TB. Compensation for active TB disease is a regulatory factor that can motivate HCWs to sustain TBIC practices by being financially responsible for their TB disease. TB is a compensable disease, though, according to the Compensation for Occupational Injuries and Diseases Act (COIDA) (Act 130 of 1993). One HCW commented:

The thing is with TB and being a health worker, should I get it, I know it's going to be my problem. I won't be able to prove that I got it here. There is nothing in place that says if you are working in the TB department, you will be compensated. So I guess if you work here, it is at your own risk. That's how I feel.

(Key informant three – Professional HCW)

A finding from a key informant interview revealed that HCWs are not required to prove the infection was healthcare associated. Further probing on the nature of compensation HCWs expect from the health system revealed both financial and non-financial incentives:

It could come in many different ways, remuneration is always a good thing, give me more money, sometimes recognition, even if it's not in form of money.

(Key informant three – Professional HCW)

The COIDA policy serves as a regulatory document that supports reimbursement of HCWs who develop TB. However, because of bureaucratic processes and delays, HCWs see TB as a 'personal problem' and not an institutional problem. Previous research suggests that such lack of trust in the system can be a barrier to motivation of HCWs who implement TBIC.³⁰

Patients' non-compliant attitudes

One other demotivating factor mentioned by lay HCWs in both clinics was the disrespectful and non-compliant attitudes of patients. This finding is in line with that of an earlier study that recognised the contributing role of patients to effective TBIC practice.³¹ Patients sometimes rebel against the use of masks by wearing them inappropriately or not wearing masks at all, as illustrated by this respondent:

They are so rude...sometimes you talk to them nicely. You say "sisi, others are wearing masks, please you must," but they say they can't because they have rights. I usually tell them "yes, you have rights but before you use your rights, you must know others have rights too."

(Key informant ten – Lay HCW)

No time for TBIC

Both professional and lay HCWs perceive TBIC as a separate item from their routine tasks. Although HCWs perceive they are at risk of getting TB and particularly dread being infected with DR-TB, they feel they are too busy to adhere fully to TBIC measures. It appears as though professional and lay HCWs are initially motivated by fear to implement TBIC but become so familiar with the working environment that the perceived risk of acquiring TB wanes over time. This perception suggests that TBIC is yet to be prioritised and integrated into service delivery procedures in clinics, as illustrated by this respondent:

I used to be scared when I started but I have gone past that now...like yesterday we were so busy here, there is no time to get paranoid.

(Key informant eleven – Professional HCW)

Training deficit

According to facility-specific policies on TBIC, in-service training is an administrative control measure. Other than professional training in medical and nursing schools, most (professional) HCWs had not received further training in TBIC. However, two professional HCWs had attended one-day training on TBIC organised by a non-governmental organisation. Although a prior needs-assessment report in both clinics has identified refresher training as integral to improved infection control, in-service training is yet to be implemented in these clinics. Two predisposing factors that determine sustained TBIC practice are HCWs' perception of risk and the training they have received on TBIC. If HCWs perceive they are at risk, they are more likely to participate in training and implement TBIC in a consistent manner. Research suggests that improvements recorded in the "work and systematic training" of health workers at primary health care level contribute to successful TB control.³² Studies have also shown the benefit of in-service training to improved TB care in resource-constrained settings within South Africa.³³ Sustained TBIC implementation requires training focused on behaviour change communication, rather than

knowledge acquisition.³⁴ In-service training can easily bridge the gap between knowledge and practice identified as a barrier to TBIC practice in previous studies.^{29,33,35}

Inadequate ventilation

Inadequate ventilation was cited as a barrier to effective TBIC in clinics. Most professional HCWs in both clinics complained about inadequate ventilation in consulting rooms and TB treatment rooms. While some HCWs generally request that vents be installed in consulting rooms and TB rooms, some HCWs who have attended dissemination meetings on infection control are specifically requesting for the installation of wind-driven roof turbines – ‘whirly birds’ – which may contribute to improved ventilation in rooms.³⁵

I don't see anything like an air vent here...that's bad. I think it will be great if they can improve ventilation. Can they put whirly birds? After that study, I think it made an impact.

(Key informant twelve – Professional HCW)

One of the study clinics is an older-style building and does not conform to current policy recommendations, which results in poor ventilation in some waiting areas.¹⁹ In this situation, while opening windows may assist with ventilation, issues of clinic design are, perhaps, more relevant. The health system needs to improve on physical infrastructure that supports natural ventilation in all sections of the clinic, otherwise HCWs will continue to experience challenges in implementing environmental controls.

Lack of shared responsibility among HCWs

Although all interviewed HCWs in one of the clinics knew there was an infection control committee, they seemed to be detached and unaware of the actual committee activities. The head of the infection control committee works in another section of the clinic, rather than in the TB section itself. When interviewed, the head of the infection control committee stated that one barrier to effective TBIC was the over reliance on the head of the infection control committee and a lack of shared responsibility among other HCWs:

The barrier is that they tend to rely on one person....it should be done by everybody. It should start with me and extend to everybody. It should be everybody's responsibility.

(Key informant thirteen – Professional HCW)

There is a need to re-sensitise HCWs to their contribution to effective TBIC practices in clinics. The leadership of infection control committees could be rotated across various departments to encourage HCWs to develop a sense of responsibility for infection control.

Conclusion

Self-reported and directly observed barriers to the implementation of TBIC were limited time owing to heavy workload, uncomfortable N95 respirators, poor ventilation due to over-crowding in some waiting areas and patients' non-compliance with the use of masks. Specific barriers related to the health system are a non-responsive compensation policy and inadequate training of HCWs on TBIC.

Bureaucratic delay in compensating HCWs (with active TB disease) is a major barrier to building trust in the health system. Such mistrust is an obstacle to sustained TBIC implementation among HCWs. Professional and lay HCWs are not implementing TBIC according to facility-specific policy. The last line of defence, PPE, was mostly prioritised by HCWs instead of administrative and environmental measures. TBIC is not likely to be effective in clinics where HCWs continue to prioritise PPE.

Protecting HCWs and patients from healthcare-associated infections is the responsibility of the health system. Professional and lay HCWs need to be trained (in service) on TB transmission risk and how to implement TBIC to ensure effective implementation in clinics. Sub-district health systems should prioritise TBIC by training HCWs and continue to provide resources needed to implement TBIC. In terms of HCWs, who are an integral part of the health system, there is a need to maximise resources provided and develop the motivation needed to maintain TBIC implementation. Further research should focus on identifying behavioural models that further explain barriers to TBIC implementation among HCWs and how to address these barriers despite patient workload, insufficient numbers of HCWs and other resource constraints that characterise poor urban townships.

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Introduction

The 2011 edition of the *South African Health Review* noted the historic release of the Green Paper on National Health Insurance (NHI) that year, and predicted that “accurate data on health status and health services [will] be necessary to inform the design of the NHI”.¹ It also predicted ever sharper debates about the adequacy and accuracy of indicator data, as the process of finalising the White Paper progressed. Specifically, the 2011 Indicator chapter noted that the extent to which private sector data were integrated with those generated in the public sector would be critical, as the NHI would need to harness the resources of both sectors. While such debates have continued, 2012 saw a more inward focus, one clearly located in the growing influence of the Negotiated Service Delivery Agreements (NSDA). However, health workers in the public sector could be forgiven for feeling like Coleridge’s Ancient Mariner, who cried

“Water, water, everywhere,
And all the boards did shrink;
Water, water, everywhere,
Nor any drop to drink”.

They are surrounded by a plethora of strategic goals, targets and measures, global, national, provincial and, perhaps, even at district level. In the absence of the means to make significant changes to service quality and delivery, such targets can be meaningless exhortations, trotted out as rote recitations without meaning or impact. Nonetheless, human nature ensures that what is measured is valued, and at the very least the potential for improvement has to be welcomed.

In 2011, the Health Data Advisory and Coordination Committee (HDACC) had been tasked with “i) improving the quality and integrity of data on health outcomes, ii) establishing consensus among research experts from various academic institutions, research institutions and government departments on indicators and indicator values, identification of reliable empirical data sources to be used to monitor these indicators as well as mechanisms to improve data systems, and iii) advising on baseline values and targets for NSDA for the 2010-2014 period”.² One of the key developments in this area will be the production of officially-sanctioned Annual Health Statistics, compiled on behalf of the National Department of Health by a team from Health Systems Trust, Medical Research Council and the University of Cape Town. The first edition is expected to be issued in early 2013.

At a government-wide level, the Medium Term Strategic Framework (MTSF) for 2009-2014 included an overarching outcome of “a long and healthy life for all South Africans”. The health-sector-wide NSDA, which sets out the Minister of Health’s Performance Agreement with the President of the Republic, has four specific outputs:

- increased life expectancy;
- reduction in maternal and child mortality rates;
- combating HIV and AIDS and decreasing the burden of disease from tuberculosis; and
- strengthening health systems effectiveness.

South Africa has also committed to the Millennium Development Goals (MDGs), for which the relevant health-related targets for the country are:

- a maternal mortality ratio of 38 per 100 000 live births;
- an infant mortality rate of 18 per 1 000 live births;
- an under-five mortality rate of 20 per 1 000; and
- life expectancy at birth of 70 years.

The corresponding baselines agreed to by HDACC were a maternal mortality ratio of 310 per 100 000 live births (for 2008), an infant mortality rate of 40 per 1 000 live births (2009), under-five mortality rate of 56 per 1 000 live births (2009) and life expectancy at birth of 54 years for males and 59 years for females (2009). These figures were therefore included in the NDoH Annual Performance Plan 2012/13-2014/15.³ Another set of obligations was listed in the form of the 10 Point Plan 2009-2014, for which an update of progress was included in the Annual Performance Plan. However, specific to the NSDA, the following targets were set for 2014/15:

- increasing life expectancy to 56 years for males and 61 years for females;
- decreasing the maternal mortality ratio to 270 per 100 000 live births;
- decreasing the child mortality rate to 50 per 1 000 live births;
- improving the TB success rate from a baseline of 73.9% (2009) to 85%; and
- increasing the total number of patients on antiretroviral treatment (ART) from a baseline of 1.1 million (2009) to 2.5 million.³

The Annual Performance Plan included broadly-stated sub-outputs for each of the four NSDA performance areas. Detailed sets of indicators for each performance area had been provided in the 2011 HDACC report, specifying the source of the data, the agency responsible for its collection and the frequency of such collection, as well as the baselines (2009) and targets (2014). The National Indicator Data Set (NIDS), which specifies the data elements to be collected by the routine data collection systems of all provinces, was revised during 2012 and will be implemented from the 2013/14 financial year. The approved NIDS requires the collection of data for 101 routine monthly indicators at facility level, covering child health (11 indicators), chronic conditions (12), the immunisation programme (15), HIV (8), the management of inpatients (5), management of PHC services (8), maternal and women’s health (27), nutrition (4), oral health (3), service quality (2) and TB (6). In addition, there are 48 quarterly indicators at facility level, which cover the ART programme, TB and service quality. Seven data elements provide ‘count indicators’ for ART and HIV. Lastly, another 52 indicators are collected on a monthly basis in relation to non-facility programmes, including Environmental Health Services (14), Emergency Medical Services (8), the Integrated School Health Programme (15, of which 4 will be reported nationally) and Ward-based Outreach Teams (15, of which 7 will be reported nationally). The list of indicators is given in the appendix: National Indicator Data Set (NIDS) indicators from April 2013.

However, 2012 also saw the approval of the National Development Plan (Vision for 2030), prepared by the National Planning Commission in 2011.⁴ The health-related targets in this document were:

- “By 2030, life expectancy should reach at least 70 for both men and women.
- The under-20 age group should largely be an HIV-free generation.
- The infant mortality rate should decline from 43 to 20 per 1 000 live births and the under-five mortality rate should be less than 30 per 1 000, from 104 today.
- Maternal mortality should decline from 500 to 100 per 100 000 live births.
- All HIV-positive people should be on treatment and preventive measures such as condoms and microbicides should be widely available, especially to young people.
- Reduce non-communicable diseases by 28 per cent and deaths from drug abuse, road accidents and violence by 50 per cent.
- Everyone has access to an equal standard of basic health care regardless of their income.”

The National Development Plan also included actions under the broad headings of addressing the social determinants of health, reducing the burden of disease, building human resources for the health sector, strengthening the national health system and implementing National Health Insurance. It was suggested that the health authorities set mid-term targets for the 2030 objectives, and in some cases examples of indicators were provided. An example for TB was the suggestion to track the “number of latently infected people receiving six months isoniazid treatment”.

Globally, Davis and colleagues have pointed to the increasing use of indicators in a wide variety of fields, and in particular those that have been ‘named’ and thus gained legitimacy and currency.⁵ Examples included the United Nations MDG indicators, the Human Development Index (HDI) produced by the United Nations Development Program, as well as Transparency International’s Corruption Perceptions Index. Such indicators may have pervasive power to influence decision-making at global and local levels. As Davis et al. put it: “Each indicator set bolsters a particular view of development with a combination of scientific authority and organizational strength.” These authors have offered a useful definition of such an indicator: “An indicator is a named collection of rank-ordered data that purports to represent the past or projected performance of different units. The data are generated through a process that simplifies raw data about a complex social phenomenon. The data, in this simplified and processed form, are capable of being used to compare particular units of analysis (such as countries, institutions, or corporations), synchronically or over time, and to evaluate their performance by reference to one or more standards.” The issue of ‘simplification’ is worth considering, but so is what Davis et al. refer to as the “ordinal structure enabling comparison and ranking and exerting pressure for ‘improvement’ as measured by the indicator”. An example is a study by Olafsdottir et al. that sought to examine the relationship between governance and health systems performance.⁶ The study used the under-five mortality rate (U5MR) as the health outcome measure, the ratio of U5MR in the wealthiest and poorest quintiles as the measure

of health equity, and two indices developed by the Mo Ibrahim Foundation as the governance measures. After controlling for possible confounders, such as finance, education, and water and sanitation, governance (as measured by the chosen indices) was significantly associated with U5MR, but not with equity in U5MR outcomes. The authors concluded that “the quality of governance may be an important structural determinant of health systems performance, and could be an indicator to be monitored”.

Recognising that the MDGs have been a positive force and have “help[ed] to promote global awareness, political accountability, improved metrics, social feedback, and public pressures”, Sachs has backed the call for post-2015 Sustainable Development Goals (SDGs). He has proposed the following major components, in “three broad categories of economic development, environmental sustainability, and social inclusion:

- SDG 1: by 2030, if not earlier, all the world’s people will have access to safe and sustainable water and sanitation, adequate nutrition, primary health services, and basic infrastructure, including electricity, roads, and connectivity to the global information network.
- SDG 2: from 2015 to 2030, all nations will adopt economic strategies that increasingly build on sustainable best-practice technologies, appropriate market incentives, and individual responsibility.
- SDG 3: every country will promote the wellbeing and capabilities of all their citizens, enabling all citizens to reach their potential, irrespective of class, gender, ethnic origin, religion, or race.
- SDG 4: governments at all levels will cooperate to promote sustainable development worldwide.”⁷

A World Health Organization (WHO) discussion paper on the post-2015 agenda has suggested using the movement towards Universal Health Coverage (UHC) as the animating force to guide the post-MDG agenda. Universal health coverage includes reducing the gap between need and use of services; improving quality of care so that services are effective; and assuring financial risk protection so that people are not impoverished as a consequence of paying for health services. An increase in life expectancy (as a summary measure of mortality at all ages and for all causes) has been proposed as an indicator and outcome of progress towards UHC.⁸ A discussion document issued in December 2012 acknowledged that fundamental questions remain about how to formally define and measure health coverage, and the authors proposed an economic model that could serve as a basis for developing an operational index of coverage.⁹

A concrete example of using the MDGs to track progress was provided by the 2012 update to the 2009 Lancet South Africa Series.¹⁰ Positive developments were noted in respect of the prevention of mother-to-child transmission of HIV and reduction in child mortality (but not neonatal mortality), as well as access to ART for pregnant women (but not in relation to antenatal HIV prevalence). While little change was noted in mortality from non-communicable diseases, a slight decrease in mortality from injuries was documented. In addition, this report also included a series of 10 targets for non-communicable diseases, taken from the South African Declaration on the Prevention and Control of Non-Communicable Diseases,¹¹ as follows:

- “Reduce premature deaths (i.e. <60 years) from non-communicable disease by 25%
- Reduce tobacco use by 20%
- Reduce per head consumption of alcohol by 20%
- Reduce mean salt intake to less than 5g/day
- Reduce prevalence of obesity and overweight by 10%
- Increase prevalence of physical activity (defined as 150 min of moderate-intensity physical activity per week) by 10%
- Reduce prevalence of hypertension by 20% through lifestyle modification and medication
- Increase proportion of people receiving treatment for control of hypertension, diabetes, and asthma by 30%
- Offer screening to women with sexually transmitted diseases for cervical cancer at least once every 5 years, or to every woman at least three times in a lifetime
- Increase number of people screened and treated for mental illness by 30% (by 2030).”

In his commentary on the Lancet article, the Minister noted that “[t]here have been a range of successes in the past 3 years”.¹² He cited, as the “most important”, the “increase in life expectancy from 56.5 to 60 years, and the decreases in child mortality from 56 to 40 per 1 000 children and in infant mortality from 40 to 30 per 1 000 infants”.

The non-communicable disease targets were also mentioned in the Annual Performance Plan.³ Thus, for example, for the Primary Health Care (PHC) Programme, a performance indicator is the number of districts implementing the Chronic Care Model (with a final target of 10 districts by 2014/15). However, other programmes may also include extensive sets of indicators and targets. A notable example is the National Strategic Plan for HIV and AIDS, STIs and TB, 2012-2016.¹³

Short Fabic et al.¹⁴ have reviewed the extent to which the data from Demographic and Health Surveys conducted in more than 80 countries have been utilised in research and have shown a steady increase in the number of peer-reviewed publications over time, claiming that these “have made a substantial contribution to the public health evidence base in developing countries”. It is therefore notable that there are no plans to repeat the South Africa Demographic and Health Survey, last conducted in 2003.¹⁵ Instead, the Annual Performance Plan notes the commitment to two different surveys: SABSSM4 and SANHANES. Both of these surveys are to be co-funded by the National Department of Health, but conducted primarily by the Human Sciences Research Council (HSRC), in collaboration with the Medical Research Council (MRC) and external partners. The South African National HIV, Behaviour and Health Survey 2012 (SABSSM4) is the fourth in a series, following surveys in 2002, 2005 and 2008. Fieldwork was intended to be complete by June 2012. The aim was to reach up to 15 000 households and 40 000 individuals, and to gather data on demographic and health indicators (including fertility, morbidity and mortality), health status, the use and access to child health, maternal health and general health services, HIV infection and sexual behaviour (including the proportion of circumcised males), and infant feeding practices. Estimates of infant, under-five and maternal mortality rates as well as current fertility trends were

planned. The first South African National Health and Nutrition Examination Survey (SANHANES-1) was planned for 2011-2012 and fieldwork started in 2012. Importantly, SANHANES is planned to have both cross-sectional and longitudinal components. The cross-sectional component is designed to provide representative data at the provincial level. Using a multi-stage disproportionate, stratified cluster sampling approach, a sample of 10 000 households will be selected (20 valid, occupied households from each of 500 Enumerator Areas (EA), representative of the socio-demographic profile of South Africa, based on the 2007 HSRC Master Sample). The longitudinal component will be addressed by recruiting a prospective cohort of 5 000 households to be followed up over time. Critically, in contrast to the self-reported data relied on for the General Household Survey, SANHANES will obtain questionnaire-based data as well as health measurements through clinical examination and the collection of blood specimens using mobile clinics. The overall objective is therefore to “generate information on the prevalence of specific diseases, together with the social determinants/drivers associated with the disease(s), nutritional status of South Africans as well as health promotion and disease prevention”.¹⁶

The specific objectives of SANHANES-1 are:

- “To evaluate the health status of South Africans with respect to the prevalence of non-communicable diseases (specifically cardiovascular disease, diabetes and hypertension) and their risk factors (diet, physical activity and tobacco use).
- To evaluate the knowledge, attitudes and behaviour of South Africans with respect to non-communicable and communicable infectious diseases.
- To evaluate the nutritional status of South Africans as an outcome of food security, dietary intake/behaviour including the consumption of alcohol, and body weight management.
- To evaluate South Africans’ general perceptions of health and healthcare services.
- To evaluate the health status of children under the age of 5 years with respect to early childhood development, breastfeeding, care of illness, immunisation and the use of the road to health booklet.
- To evaluate the health status of children between 2-9 years with respect to physical and/or mental disabilities.
- To determine the behavioural and social aspects of health of South Africans in terms of smoking, dietary quality and physical inactivity as well as household composition and amenities, level of education, age, gender, race, socio-economic status and geotype, and relate these to the health and nutritional status of the South African population.”

Important new data on socio-economic status is being generated from the National Income Dynamics Study (NiDS), which was first mooted in 2006. This study, conducted on behalf of the Presidency by the Southern Africa Labour and Development Research Unit (SALDRU) at the University of Cape Town, planned to follow a cohort of about 28 000 people (originally 7 305 households) over time. The ‘first wave’ was documented in 2008, with subsequent ‘waves’ planned every two years. NiDS aimed to “document the dynamic structure of a sample of household members in South Africa and changes in their incomes, expenditures, assets, access

to services, education, health and other dimensions of well-being".¹⁷ Importantly, as members of these households moved out to set up their own households or returned, they would not be lost, but would be followed in subsequent 'waves'. Wave 2 was conducted in 2010 and reported in 2012.¹⁸

As always, important lessons can be learned from the narrow, focused study, as well as from the wide, national-level survey. For instance, Mphatswe and colleagues conducted an intervention study in 58 antenatal clinics and 20 delivery wards in KwaZulu-Natal that provided prevention of mother-to-child prevention (PMTCT) services and reported data to the District Health Information System (DHIS).¹⁹ Data completeness increased from 26% before to 64% after the intervention, while data accuracy increased from 37% to 65%. Overall, the correlation between data in the information system and those from facility registers rose from 0.54 to 0.92. The important lesson here relates not just to the effectiveness of a simple intervention (involving training and feedback, monthly data reviews and data audits at facilities), but to the abysmal levels of data completeness and accuracy at baseline.

Lastly, in any country, the completion of a national Census provides fresh impetus to any accounting of the status of its citizens. While only the first statistical releases from Census 2011 have been published, amidst much controversy, the impact of new population estimates on any indicators that use such figures (as denominators, for instance) will be profound.²⁰

In summary, there is no lack of targets, nor any lack of apparent political commitment to reach those targets. Whether there are adequate systems in place to measure progress towards the attainment of such targets with any degree of accuracy is quite another matter. Whether any significant progress has been made in integrating national health information systems, particularly across the persistent public-private gap, also remains in question. Such data will be crucial to tracking progress in relation to Universal Health Coverage. Nonetheless, there are an increasing number of sources, including planned large surveys, as well as planned longitudinal approaches, which promise new and exciting data.

Data sources and collection

As before, while this chapter attempts to identify most of the key international and national data sources and literature on a range of health indicators, it cannot claim to be exhaustive. Although known issues of data quality or interpretation are highlighted where possible, it is not possible in such a broad chapter to verify, adjust and correct every data source in detail. The reader is advised to be cautious about which types of indicators are presented and whether their use is suitable for the intended purpose. The data provided in this chapter are only a sub-set of those available. More data, particularly those showing trends over time, are stored in the Health Statistics Database, which can be accessed on the Health Systems Trust (HST) website (www.hst.org.za). In addition, a substantial set of district-level data are presented in the District Health Barometer reports, which can also be accessed from the HST website. Most importantly, detailed district- and local municipality-level data will also be issued in the form of the Annual Health Statistics publication, the first edition of which is expected in early 2013. This publication will provide data showing trends in population demography, morbidity and mortality patterns, financial and human resources and progress in relation to service

delivery, but focused on the public health sector. The indicators used in the Annual Health Statistics publication were collected from different sources, including routinely collected data, surveillance data and periodic surveys. In this chapter, in contrast, data are primarily disaggregated by province and ethnic group. Where data or maps are provided showing district-level details, these have followed the Municipal Demarcation Board's determinations which came into effect with the municipal elections in May 2011. Some of the most important changes made at this time were the incorporation of all district-managed areas into districts, the creation of two new metropolitan municipalities (Buffalo City in the Eastern Cape and Mangaung in the Free State), the transfer of Mbizana Local Municipality and Ntabankulu Local Municipality from OR Tambo District to Alfred Nzo District in the Eastern Cape, and the incorporation of Metsweding Local Municipality into the Tshwane metro in Gauteng.

Indicator definitions: The definitions of all indicators appearing in the tables are given at the end of the chapter on page 310.

Trends and time-series: For most indicators data are given for several years, often from multiple different sources. In most cases these data can thus not be used to assess trends and changes over time due to possible differences in methodology and data presentation issues. Even data from regular surveys may not be comparable over time, or revised data for a historical time series may be released, as for example with the General Household Surveys and mid-year population estimates. This may result in different values being published compared to previous editions. Therefore, when using time series data, the most recent revisions should be obtained from the online database and not from previous printed editions of this chapter.

Demographic indicators

Context	Demographic indicators are critical input variables for many other indicators, as they provide denominator data over time. In order to monitor progress towards equity, South Africa still tracks ethnic differences, using four self-attributed categories (African, Coloured, Indian, and White). These categories are thus used to show data that are available by ethnic group.
New data sources	Some of the key new sources of national data included in this section are: <ul style="list-style-type: none"> • StatsSA Census 2011 – various statistical reports • StatsSA General Household Survey (GHS) 2011 • StatsSA Recorded Live Births 2011 Internationally: <ul style="list-style-type: none"> • Population Reference Bureau World Population Data Sheet 2012 • United Nations Population Fund (UNFP) State of the World Population 2012
Key issues and trends	<ul style="list-style-type: none"> ➢ StatsSA 2012 mid-year population estimates were delayed in order to incorporate findings from the Census, and will resume with the 2013 estimates. ➢ Although some results from Census 2011 were released in late 2012, small-area population estimates have not yet been incorporated into the denominators used for indicator calculations. At the provincial level, the mid-year estimates have also continued to be used. The same approach is expected to be followed in the first edition of the Annual Health Statistics publication.

Some results from Census 2011 were released in late 2012. A new total population estimate of 51 770 560 for the entire country was issued. In provincial terms, Gauteng (population 12 272 263) was reported to have overtaken KwaZulu-Natal (10 267 300) as the most populous.

In 2012, the UNFP's State of the World Population 2012 report focused on the issues of access to modern family planning options and the extent to which women's rights in this regard are being met globally.²¹ Estimates of fertility will be among the most contested elements of the Census 2011 results, once these are released.²⁰ Already, serious concerns have been raised about the accuracy and validity of the demographic data that have been reported.²² In particular, questions have been asked about the relative sizes of the 0-4 year group and the 5-9 year group in the national population pyramid, and what this implies about changes in fertility over time. In terms of available vital registration data, StatsSA has reported that, by their estimate, the level of completeness of birth registration within the year of birth has improved consistently, from 47.9% in 2002 to 85.9% in 2011.²³ Including late registration, the total number of births registered has fluctuated between 2008 and 2011. The total number of births registered in 2011 (1 202 377) declined by 7.1% from that registered in 2010 (1 294 694). This was in contrast to the steady increase in total registered births between 1992 (501 461) and 2003 (1 677 415), and the steady decline from 2004 (1 475 809) to 2007 (1 199 712). Of note, in 2011, 67.5% of submitted Notice of Birth forms (DHA-24) omitted mention of the father's details. The accepted viewpoint is that South Africa has seen a rapid decline in total fertility since 1960, and that this has been the largest recorded decline on the African continent. Rossouw and colleagues from Stellenbosch have used data from Wave 1 (2008) of the National Income Dynamics Study (NiDS) to explore potential contributory factors to this decline.²⁴ While attributing much of the decline to improved education levels and the lower prevalence of marriage, these authors have also noted that other factors may also be at play, including the influence of HIV/AIDS, increased use of contraceptives and "changes in intra-household relationships and the social role of women". Total fertility

rates reported for South Africa (2.4) can be benchmarked against those reported by the Population Reference Bureau.²⁵ The country with the highest total fertility rate (TFR) was Niger (7.1), with only one country in the top 10 being from outside Africa (Afghanistan; 6.2). The lowest TFR was recorded in Taiwan and Latvia (both 1.1), followed by Singapore, Bosnia-Herzegovina, South Korea and Hungary (all 1.2).

As attention is focused on non-communicable diseases, so the proportion of the population that is middle-aged and older becomes more important. While traditionally, an ageing population is associated with developed nations, it has been pointed out that the "developing world is going grey".²⁶ It is predicted that 80% of the 2 billion elderly people predicted for 2050 will be living in developing countries. South Africa is one of six countries (together with China, Ghana, India, Mexico, and Russia) contributing to the WHO Study on Global AGEing and Adult Health (SAGE).²⁷ Baseline data for this survey were obtained from the 2002-2004 World Health Survey, the instruments were piloted in three countries in 2005, and Wave 1 was conducted in the six target countries between 2007 and 2010. Subsequent waves were planned for 2012 and 2014. Some Wave 1 data for South Africa have been reported.²⁸ At a local level, some insights into the potential health implications of ageing have been explored using the Agincourt Health and Demographic Surveillance System.²⁹⁻³¹ As part of the SAGE effort, all those aged 50 years and older were assessed during the 2006 annual census. In this rural setting, of a group with a mean age of 66.6 years, 75.2% were women, 45.6% were in a current partnership, and 65.8% had no formal education. Factors associated with poor health were age, female gender, not being in a current partnership, lack of education and unemployment.

Table 1: Demographic indicators by province

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Age dependency ratio											
1996	83.5	56.4	42.0	68.2	92.4	68.3	62.3	63.5	52.4	64.4	a
2001	75.7	55.4	38.1	64.8	81.8	64.6	56.4	57.0	48.2	58.7	b
2011 Census	66.0	52.8	38.9	58.4	67.3	56.0	55.7	52.2	44.9	52.6	c
Ageing index											
2001	13	12	12	10	10	9	13	12	14	11	d
2011	18	17	17	13	15	13	20	16	21	16	d
2011 Census	20	19	18	15	18	15	19	19	23	18	e
Annual population growth rate											
2001 1996-2001	0.42	0.55	3.62	2.23	1.75	1.49	-0.40	1.80	2.68	1.99	f
2010	-	-	-	-	-	-	-	-	-	1.10	g
2011 2001-2011	0.44	0.14	2.68	0.69	0.79	1.83	1.44	1.62	2.52	1.44	f
Area (square km)											
2011	168 966	129 825	18 178	94 361	125 754	76 495	372 889	104 882	129 462	1 220 813	c
Area as a % of total area of South Africa											
2011	13.8	10.6	1.4	7.7	10.3	6.3	30.5	8.7	10.6	100.0	c
Average household size											
1996	4.6	4.1	3.7	5.0	4.9	4.6	4.3	4.6	3.9	4.4	h
2001	4.1	3.6	3.2	4.2	4.3	4.0	3.8	3.7	3.6	3.8	i
2007 CS	4.1	3.5	3.3	4.6	4.3	3.9	4.0	3.7	3.8	3.9	j
2011 Census	3.7	3.2	3.0	3.9	3.7	3.7	3.7	3.2	3.4	3.4	k
Crude death rate (deaths per 1 000 population)											
2001 StatsSA	-	-	-	-	-	-	-	-	-	11.9	l
2011 StatsSA	-	-	-	-	-	-	-	-	-	11.7	l
Population											
2001 Census	6 436 763	2 706 775	8 837 178	9 426 017	5 273 642	3 122 990	822 727	3 669 349	4 524 335	44 819 778	m
2007 CS	6 527 746	2 773 066	10 451 709	10 259 230	5 238 286	3 643 435	1 058 057	3 271 946	5 278 591	48 502 066	j
2011 Census	6 562 053	2 745 590	12 272 263	10 267 300	5 404 868	4 039 939	1 145 861	3 509 953	5 822 734	51 770 561	c
2011 mid-year	6 829 959	2 759 644	11 328 203	10 819 128	5 554 657	3 657 181	1 096 731	3 253 390	5 287 863	50 586 757	n
2011 DHIS	6 654 852	2 930 369	10 929 388	10 622 198	5 261 983	3 661 839	1 158 080	3 497 832	5 553 968	50 270 509	o
2012 DHIS	6 671 956	2 941 267	11 091 033	10 703 919	5 282 562	3 689 833	1 162 538	3 519 130	5 641 880	50 704 118	o
Population % by province											
2001 Census	14.4	6.0	19.7	21.0	11.8	7.0	1.8	8.2	10.1	100.0	i
2007 CS	13.5	5.7	21.5	21.2	10.8	7.5	2.2	6.7	10.9	100.0	j
2011 Census	12.7	5.3	23.7	19.8	10.4	7.8	2.2	6.8	11.2	100.0	c
2011 mid-year	13.5	5.5	22.4	21.4	11.0	7.2	2.2	6.4	10.5	100.0	n
Population % composition											
2001 60+ years	9.2	7.3	6.2	6.9	7.7	6.3	8.2	7.3	7.8	7.3	i
2001 <15 years	36.8	30.7	23.6	34.7	39.4	35.0	30.6	31.3	27.3	32.1	i
2001 female	53.8	52.1	49.7	53.2	54.6	52.1	50.4	51.2	51.5	52.2	i
2007 60+ years	9.6	8.0	6.9	7.1	8.5	6.5	9.0	7.6	8.6	7.8	j
2007 <15 years	35.6	28.8	25.4	33.5	37.0	33.5	28.7	30.2	26.3	31.0	j
2007 female	52.9	51.6	50.3	52.5	53.8	51.4	50.9	49.7	51.3	51.7	j
2011 60+	9.7	8.3	6.8	7.6	8.6	7.0	8.5	8.3	8.9	8.0	c
2011 <15 years	33.0	29.1	23.7	31.9	33.9	31.2	30.1	29.6	25.1	29.1	c
2011 female	52.9	51.6	49.5	52.5	53.3	51.1	50.7	49.3	50.9	51.3	c
Population density (people per km²)											
1996	38.4	21.0	448.4	95.1	41.7	36.7	2.3	29.9	31.5	34.4	h
2007	40.6	22.8	572.3	108.5	44.0	44.5	3.0	29.2	37.4	39.2	p
2011	40.4	21.3	623.2	114.7	44.2	47.8	2.9	31.0	40.8	41.4	r
2011 Census	38.8	21.1	675.1	108.8	43.0	52.8	3.1	33.5	45.0	42.4	c
Public sector dependent population											
2011 non med scheme	6 115 191	2 362 732	8 239 778	9 509 917	5 118 266	3 074 542	915 048	2 751 901	3 981 410	42 060 348	r
2012 GHS	5 931 369	2 441 252	8 440 276	9 387 337	4 902 218	3 158 497	1 011 408	3 040 528	4 225 768	42 540 755	s
Total fertility rate											
1996	3.5	2.8	2.4	3.1	3.6	3.2	2.7	2.8	2.4	-	t
1998 SADHS	3.5	2.2	2.3	3.3	3.9	3.1	2.7	2.4	2.3	2.9	u
2001 CARe	3.3	2.5	2.4	3.0	3.6	3.1	2.4	2.8	2.4	2.8	v
2006 CS	3.0	2.7	2.2	3.0	3.5	3.0	2.8	3.0	2.1	2.8	w
2006 NiDS	-	-	-	-	-	-	-	-	-	2.8	x

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
2006 StatsSA	-	-	-	-	-	-	-	-	-	2.6	y
2011 StatsSA	-	-	-	-	-	-	-	-	-	2.4	n

Reference notes (indicator definitions from page 310 and references from page 315)

- a Census 1996.³² Calculated.
- b Census 2001.³³ Calculation reported in Joubert J, Bradshaw D. Health of Older Persons. In: Ijumba P, Day C, Ntuli A, editors. South African Health Review 2003/04.
- c Census 2011.²⁰ Census in Brief.
- d StatsSA Mid-year estimates.³⁴ Calculated from source.
- e Census 2011.²⁰ Calculated.
- f Census 2011.²⁰ 1996-2001 and 2001-2011. Per cent per annum. As recorded in Census 2011 Municipal Fact Sheet.
- g StatsSA Mid-year estimates. For 2010-2011. 2011 mid-year estimates.
- h Census 1996.³²
- i Census 2001.³³
- j Community Survey 2007.³⁵
- k Census 2011.²⁰ Statistical release P0301.⁴
- l StatsSA Mid-year estimates.³⁴ 2011 mid-year estimates. CDR assumption used in population projections.
- m Census 2001.³³ Preliminary independent demographic analyses of this report suggest that the final figures probably reflect: an underestimate of children under the age of 5; an overestimate of children aged between 10 and 19; an underestimate of men relative to women; an underestimate of the white population. Data source also includes other tables with more levels of disaggregation than are shown here.
- n StatsSA Mid-year estimates.³⁴ 2011 mid-year estimates.
- o DHIS Population Estimates.
- p StatsSA Mid-year estimates.³⁴ Calculated from 2007 mid-year estimates and provincial areas from Municipal Demarcation Board 2006.
- q StatsSA Mid-year estimates.³⁴ Calculated from Municipal Boundaries of South Africa GIS dataset received 2009-10-15 and latest StatsSA mid-year population estimates.
- r Medical Schemes 2011-12.³⁶ Calculated from total number of beneficiaries subtracted from total population (Stats SA mid-year estimates 2011).
- s StatsSA GHS 2011.³⁷ Calculated using provincial medical scheme coverage (GHS 2011) and National DoH/HISP Population Estimates for 2012.
- t SAHR 2000 Ch4.³⁸ Based on 1996 Census. Quoting Dorrington R, Nannan N, Bradshaw D. Current fertility rates in South Africa: 1996 Census revisited. (Submitted to) Southern African Journal of Demography 2000.
- u SADHS 1998.³⁹ The 1998 national TFR is considered to be an underestimate. The real figure is considered to be about 3.2 (see Udjo EO, Lestrade-Jefferis J. Fertility and mortality in South Africa. (on request from StatsSA)) Differences between subgroups show that fertility rates are correlated with education level, urban/rural residence, province and population group. Table 11 pg 19.
- v CARE Fertility.⁴⁰
- w CS Fertility 2007.⁴¹
- x NiDS Demography Wave 1.⁴² Rates are estimated for the three year period preceding the survey. The indicated fertility rates for Whites and Indians are implausibly high from this survey, possibly due to the small sample size for these groups and issues with the weighting procedures.
- y StatsSA Mid-year estimates.³⁴ 2010 mid-year estimates.

Table 2: Demographic indicators by ethnic group

	African	Coloured	Indian	White	Other	All	Ref
Ageing index							
2001	8	12	19	51	-	11	a
2011	12	16	31	77	-	16	a
2011 Census	14	17	34	84	23	18	b
Population							
2001 Census	35 416 166	3 994 505	1 115 467	4 293 640	-	44 819 778	c
2007 CS	38 255 162	4 375 528	1 244 632	4 626 744	-	48 502 066	d
2011 Census	41 000 938	4 615 401	1 286 930	4 586 838	280 454	51 770 561	e
2011 mid-year	40 206 275	4 539 790	1 274 867	4 565 825	-	50 586 757	f
Population % by ethnic group							
2001 Census	79.0	8.9	2.5	9.6	-	100.0	g
2007 CS	78.9	9.0	2.6	9.5	-	100.0	d
2011 Census	79.2	8.9	2.5	8.9	0.5	100.0	e
2011 mid-year	79.5	9.0	2.5	9.0	-	100.0	f

Reference notes (indicator definitions from page 310 and references from page 315)

- a StatsSA Mid-year estimates.³⁴ Calculated from source.
- b Census 2011.²⁰ Calculated.
- c Census 2001.³³ Preliminary independent demographic analyses of this report suggest that the final figures probably reflect an underestimate of the White population.
- d Community Survey 2007.³⁵
- e Census 2011.²⁰ Census in brief.
- f StatsSA Mid-year estimates.³⁴ 2011 mid-year estimates.
- g Census 2001.³³

Socio-economic indicators

Context	A number of key socio-economic indicators were among the early data released from the Census 2011. Some of these, such as measures of access to piped water and safe sanitation, and type of energy source, reflect important social determinants of health. Over time, trends in such measures are important indications of the effectiveness of social spending and infrastructure development.
New data sources	Nationally, new data have been reported in the: <ul style="list-style-type: none"> • StatsSA Census 2011 • StatsSA General Household Survey (GHS) 2011 • StatsSA Social profile of vulnerable groups in South Africa: 2002-2011 • StatsSA Quarterly Labour Force surveys • National Income Dynamics Study Wave 1 and Wave 2 • StatsSA Labour Market Dynamics in South Africa 2011 • Blue Drop 2012 report on drinking water quality management • Green Drop 2012 report on waste water management Internationally, reports of interest include: <ul style="list-style-type: none"> • UNICEF Progress on Drinking Water and Sanitation: 2012 Update
Key issues and trends	Although progress in relation to access to piped water and sanitation services has been shown in both annual surveys and the Census 2011, the quality of such services is under increasing pressure. Unemployment remains unacceptably high and significant numbers of South Africans can be termed as belonging to vulnerable groups.

The General Household Survey 2011 showed that only 53.6% of households were living in dwellings that were fully owned, with the remainder partially owned, rented or having some other tenure arrangement.³⁷ It also showed that 15.3% of households were living in 'RDP' or state-subsidised housing and that 12.1% of households were living in informal housing. Although access to electrical power was relatively high on a national basis (82.7%), 47.2% of households in Limpopo and 36.0% of households in the Eastern Cape still relied on wood or paraffin for cooking. Likewise, while nationally 89.5% of households had access to piped water, this figure was only 56.8% in the Eastern Cape. The proportion of households that had no access to sanitation or relied on the bucket system was still high in the Eastern Cape (17.0%), Limpopo (7.9%) and Northern Cape (7.6%). Results for the same measures were also reported for the national and provincial levels in the preliminary results from Census 2011.²⁰ For example, 84.7% of households were reported to have access to electric lighting, 46.3% to piped water inside the dwelling and 60.1% to flush toilets. Ownership of household assets such as refrigerators had increased from 2001 (51.2%) to 2011 (68.4%), but the most dramatic change was in access to a cellular telephone (from 32.3% to 88.9%).

Based on data from successive General Household Surveys, StatsSA issued the third in a series of reports on the social profile of vulnerable groups in South Africa in 2012.⁴³ The groups described were children, youth, women and the elderly. Also based on the same surveys, Ataguba et al. demonstrated the existence of socio-economic gradients in self-reported ill-health in South Africa.⁴⁴ Put simply, this showed that the "burden of the major categories of ill-health and disability is greater among lower than higher socio-economic groups". Although there were only limited data on two non-communicable diseases (diabetes and hypertension), it appeared that these conditions were becoming more evenly distributed over time. Importantly, this means that they cannot simply be dismissed as diseases of affluence.

Measures of access to piped water or sanitation methods do not, of course, necessarily reflect adequate quality of such services. In this regard, the 2012 updates to the reports from the Department of Water Affairs on drinking water quality management (Blue Drop 2012)⁴⁵ and waste water management (Green Drop 2012)⁴⁶ are important. In this regard, Wright et al. used data from General Household Surveys from 2002 to 2009 and detected an increasing (albeit small) proportion of those using in-house, piped supplies who believed their water was 'unsafe'.⁴⁷ They acknowledged though that since "consumer perception of drinking water safety seems largely dependent on the organoleptic properties of water supplies", public opinion may not be altered by the release of water quality reports such as the Blue Drop reports. Globally, the UNICEF report Progress on Drinking Water and Sanitation – has provided an update on progress at a national level.⁴⁸ Although the MDG drinking water target has been reached (in that the proportion of the global population still using unimproved water sources had declined from 24% in 1990 to 11% in 2012) and over 2 billion people had gained access to improved water sources, there was still evidence of marked disparities. Importantly though, the limitations of relying on the proxy measure of 'improved methods' which may not be 'safe' were noted.

Table 3: Socio-economic indicators by province

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Drinking Water System (Blue Drop) Performance Rating											
2010	79.4	48.5	85.5	65.9	55.0	65.4	46.9	66.0	92.5	67.2	a
2011	77.3	64.1	95.1	80.5	64.0	56.5	62.1	62.3	94.1	72.9	a
2012	82.1	73.6	98.1	92.1	79.4	60.9	68.2	78.7	94.2	87.6	b
Education level: percentage of population 20 years and older with no schooling											
2001 Census	22.8	16.0	8.4	21.9	33.4	27.5	18.2	19.9	5.7	17.9	c
2007 CS	-	-	-	-	-	-	-	-	-	10.3	d
2011 Census	10.5	7.1	3.6	10.7	17.3	14.0	11.3	11.8	2.7	8.6	e
2011 no schooling	7.4	5.7	2.6	7.8	12.9	10.3	11.3	10.0	1.7	6.5	f
Percentage of households by type of housing											
2001 formal	47.3	62.9	65.6	56.6	70.7	67.3	80.2	68.6	78.4	63.8	c
2001 informal	11.0	26.1	23.9	10.8	6.6	16.0	12.5	22.3	16.2	16.4	c
2001 other	3.6	3.8	9.2	4.7	3.0	3.8	3.8	3.8	3.2	5.0	c
2001 traditional	38.1	7.2	1.3	27.9	19.7	12.9	3.5	5.3	2.2	14.8	c
2007 informal CS	8.0	18.4	22.7	8.6	5.6	11.7	10.5	23.8	14.2	14.4	d
2011 formal Census	63.2	81.1	79.8	71.6	89.8	83.8	82.4	76.2	80.4	77.6	e
2011 informal Census	7.7	15.7	18.9	8.3	5.2	10.9	13.1	21.2	18.2	13.6	e
2011 other Census	0.9	0.9	0.9	1.0	0.5	0.8	1.3	0.9	1.0	0.9	e
2011 traditional Census	28.2	2.4	0.4	19.0	4.5	4.5	3.2	1.7	0.5	7.9	e
2011 informal GHS	6.5	11.0	20.4	7.3	4.5	7.0	7.0	18.5	15.1	12.1	f
Percentage of households using electricity for cooking											
2001 Census	27.8	47.0	73.2	48.3	25.0	40.0	59.0	44.6	78.8	51.4	c
2007 CS	45.3	75.2	81.3	61.0	40.3	55.7	77.2	65.8	88.8	66.4	d
2011 Census	62.1	84.5	83.9	68.6	49.9	69.3	78.1	75.3	86.9	73.9	e
2011	59.8	88.0	79.3	71.2	50.4	67.5	79.8	75.6	89.5	73.1	f
Percentage of households with access to piped water											
2001 Census	62.4	95.7	97.5	73.2	78.0	86.7	96.6	86.2	98.3	84.5	c
2007 CS	70.8	97.3	97.9	79.3	83.6	91.1	94.4	89.9	98.9	88.7	d
2011 Census	77.8	97.8	98.2	85.9	86.0	87.4	97.4	91.6	99.1	91.2	e
2011	74.8	96.2	97.4	84.5	82.2	86.9	95.1	89.6	99.5	89.5	f
Percentage of households with no toilet / bucket toilet											
2001 Census	30.8	9.7	3.6	16.2	23.3	10.3	11.2	9.6	7.7	13.6	c
2007 CS	23.5	3.2	1.6	10.4	12.4	8.0	6.9	5.8	3.8	8.3	d
2011 Census	15.0	8.6	2.9	8.0	7.8	7.2	12.0	6.8	6.7	7.2	e
2011	17.0	4.6	1.1	4.8	7.9	6.7	7.6	5.5	3.4	5.7	f
Percentage of households with refuse removal											
2001 Census	36.6	58.6	84.2	49.2	14.2	38.7	68.7	37.0	87.8	55.4	c
2007 CS	37.2	74.5	85.1	50.6	17.7	39.7	70.1	52.6	90.3	60.1	d
2011 Census	43.5	72.7	89.9	53.1	21.8	43.7	66.3	50.2	91.1	63.6	e
Percentage of households with telephone (telephone in dwelling or cell phone)											
2001 Census	29.0	35.3	56.1	39.0	28.0	37.9	41.8	34.5	63.1	42.4	c
2007 CS	63.9	71.4	83.7	75.7	71.1	78.7	67.6	72.3	83.5	76.2	d
2011	84.0	88.7	93.9	93.5	92.0	93.4	80.7	88.7	89.4	90.9	g
Unemployment rate (official definition)											
2010 Q2	27.7	28.0	27.1	20.8	22.6	28.1	30.1	28.1	21.8	25.3	h
2011 Q1	26.9	27.9	26.9	20.3	19.3	30.8	31.3	25.0	22.2	25.0	h
2012 Q1	28.3	32.2	26.0	20.5	21.9	30.3	24.9	26.2	22.8	25.2	h
2012 Q2	28.6	32.9	25.4	19.8	20.2	28.9	29.9	26.2	23.2	24.9	h
2012 Q3	28.8	32.0	24.8	21.3	22.2	31.1	30.0	25.0	25.4	25.5	h

Reference notes (indicator definitions from page 310 and references from page 315):

- a Blue Drop 2011.⁴⁹
- b Blue Drop 2012.⁴⁵
- c Census 2001.³³
- d Community Survey 2007.³⁵
- e Census 2011.²⁰
- f StatsSA GHS 2011.³⁷
- g StatsSA GHS 2011.³⁷ Note that the Census 2011 did not appear to report comparable information on this indicator and therefore the results are not presented here.
- h StatsSA Labour Force Survey.⁵⁰

Health status indicators

Mortality

Context	The release of data from the Global Burden of Disease Study 2010 has galvanised this entire field. Locally, while some progress has been made, the quality of cause of death reporting still needs attention.
New data sources	Nationally, new data have been reported in the: <ul style="list-style-type: none"> • StatsSA Mortality and causes of death in South Africa, 2009: Findings from death notification • StatsSA levels and trends in morbidity and mortality among children aged under-five years in South Africa, 2006-2010 • MRC Rapid Mortality Surveillance report 2011 Internationally, reports of interest include: <ul style="list-style-type: none"> • Global Burden of Disease Study 2010
Key issues and trends	South Africa's life expectancy at birth has been estimated, based on rapid surveillance data from the National Population Register, to have increased to 60.0 years in 2011 (57.2 years for men and 62.8 years for women), exceeding the NSDA targets set for 2014. Progress has also been noted in relation to the under-five mortality rate and the infant mortality rate, but not the neonatal mortality rate. Data on the maternal mortality ratio are still subject to a 2-year delay, as they cannot be obtained from the Rapid Mortality Surveillance (RMS) system.

This quote from Professor Christopher Murray of the Institute for Health Metrics and Evaluation (IHME) captures the challenge of the Global Burden of Disease (GBD) Study 2010^a perfectly: "As more data are made available and/or collected, the task of tracing global health epidemiology is much more challenging than when there was little data available. This may seem paradoxical but when there are no data; the task is actually easier to generate a model than when there are conflicting or complex patterns in the data that must be captured and reflected in the results. In other words, progress in global health measurement makes the task of tracking global health problems more complex and time consuming—not less".⁵¹ The GBD 2010 was released as a themed issue of the *Lancet* in December 2012,^b and immediately elicited major media commentary. An earlier release of malaria data had already caused a flurry by claiming a far larger mortality burden than had previously been accepted.⁵² The GBD 2010 was a major global research effort, conducted over a five-year period by 486 researchers at 302 institutions in 50 countries. Among the major findings was a nuanced interpretation of the epidemiological transition, in which emerging non-communicable burdens of disease did not replace infectious causes, but existed alongside them, as a 'dual' burden. Nonetheless, for sub-Saharan Africa, the majority of deaths were still due to infectious, maternal, neonatal and nutritional causes. AIDS remained the leading cause of death in southern and eastern Africa, and amongst young women in particular. One of the positive findings was the marked decline in the estimate of the number of children who died from measles, from 600 000 in 1990 to 125 000 in 2010. This appeared to represent a major gain from vaccination, as well as other public health and quality of care interventions. One of the really challenging consequences of the GBD 2010 is the question of how to allocate (or re-allocate) resources in order to address leading causes of morbidity and mortality, but also to focus on those that are most amenable to cost-effective interventions. Dealing with the many confounders and also competition for scarce resources will occupy policymakers for many years.

Locally, cause of death data from death notifications were updated for the 2009 year, as well as reflecting late registrations for the previous years covered (1997-2008).⁵³ As expected, the total number of death notifications (572 673 in 2009) exceeded the number recorded in the National Population Register (NPR) (532 713 in 2009), as it included non-South African citizens who were temporarily in the country at the time of their deaths and all South African citizens and permanent residents who died before notice of their births had been registered or captured in the NPR. No major changes were noted over time in the proportion of deaths that were attributed to symptoms, signs and abnormal clinical and laboratory findings not elsewhere classified (codes R00-R99) or to ill-defined and unknown causes of mortality (codes R95-R99). In 2009, the most common main group of causes of death remained 'certain infections and parasitic diseases', accounting for 25.0% of all deaths. Importantly, this included 1 184 deaths due to multidrug-resistant tuberculosis (MDR-TB) and 151 deaths due to extensively drug-resistant tuberculosis (XDR-TB), representing increases of 65.6% and 11.0% over 2008, respectively. The second most common main group of causes of death was 'diseases of the circulatory system', which accounted for 14.7% of reported deaths.

In order to increase the public health utility of cause of death data, various adjustments can be made to proportionally redistribute deaths of unknown ages and deaths that have been misclassified as due to ill-defined symptoms and other 'garbage' codes.⁵⁴ After this, the Years of Life Lost (YLLs) can be estimated for each age, sex and cause category by multiplying the observed number of deaths by the expected life expectancy in each age category. The YLLs are an estimate of premature mortality and thus highlight the causes of death that should be targeted by preventive interventions. The leading YLLs for South Africa, based on 2009 data, are shown in Figure 1.

The demographic and surveillance sites (DSSs) are not representative of the country, but do provide an incredibly rich source of data from which nuanced understanding of mortality changes can be drawn. For example, Sartorius described the complex interaction of highly

a <http://www.healthmetricsandevaluation.org/gbd>

b <http://www.thelancet.com/themed/global-burden-of-disease>

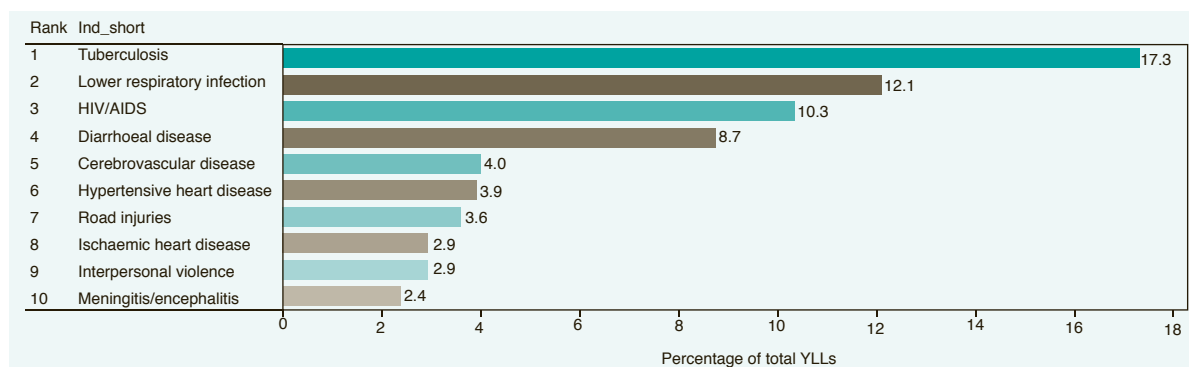
attributable multilevel factors on mortality risk in Agincourt, and Bor et al. link the gain in adult life expectancy of 11.3 years between 2003-2011 to the value of scaling up HIV treatment.^{55,56}

Of direct importance to South Africa's MDG efforts, StatsSA released an update on under-five morbidity and mortality in 2012, based on a variety of data from 2006 to 2010.⁵⁷ Data for this report were drawn not only from administrative reporting of causes of death (2006-2009), but also from the General Household Surveys (2006-2010) and the Living Conditions Survey (2008/9).⁵⁸ In 2009, the most common main group of causes of death in under-fives was 'certain infectious and parasitic diseases', accounting for 26.6% of recorded deaths. This was followed by perinatal conditions (24.8%) and diseases of the respiratory system (15.8%).

Given the time delay in cause of death data being released by StatsSA, a Rapid Mortality Surveillance (RMS) system was established to monitor trends in the number of deaths recorded on the NPR. A report from this system was released in August 2012 to wide acclaim.⁵⁹ The primary cause of the excitement generated by this report was the claim that South Africa had, based on these data, already exceeded its life expectancy goals for 2014, for both men and women. This report provides very important details of the adjustments made to raw data in order to generate estimates of mortality measures, as well as the alternative source of information used for estimating the neonatal mortality rate (relying on the DHIS, as fewer than 10% of neonatal deaths were recorded on the NPR). The unexpectedly good life expectancy data were explained as due to "a significant decline in the mortality of children under the age of 1, but also to a decline in adult mortality, probably as a result of greater than expected roll-out of ARVs".

While focused specifically on the wide range of sources of mortality data that are available in South Africa, their development and current performance, the comprehensive and accessible review published by Joubert et al. in December 2012 identifies actions that have far wider application.⁶⁰ These authors have recommended three broad areas that need attention: data quality (such as improving the quality of fieldwork, addressing the completeness of vital registration and the accuracy of medical certification of death), data triangulation (for example, by promoting linkage and validation studies), and analytic capacity. The same could be said of all areas of health information, which require additional human and fiscal resources, not for their own sake, but to enable "enhanced resource and service distribution, and, eventually, better meeting the health needs of the population".

Figure 1: Leading causes of Years of Life Lost (YLLs) for SA, 2009



Source: DHB 2011/12,⁵⁴ based on analysis of StatsSA Causes of death 2009.

Table 4: Mortality indicators by province

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Adult mortality (45q15 - probability of dying between 15-60 years of age)											
2000 GBD 2010 female	-	-	-	-	-	-	-	-	-	32.3	a
2000 GBD 2010 male	-	-	-	-	-	-	-	-	-	44.5	a
2007 ASSA2008	45.2	56.2	46.0	60.2	37.8	55.1	39.3	50.3	33.2	48.6	b
2007 ASSA2008 female	60.5	48.6	39.0	51.9	34.4	51.0	32.0	40.8	27.1	41.2	b
2007 ASSA2008 male	52.6	63.8	52.9	68.4	41.3	59.2	46.5	59.9	39.2	56.1	b
2007 NiDS female	-	-	-	-	-	-	-	-	-	52.0	c
2007 NiDS male	-	-	-	-	-	-	-	-	-	57.0	c
2009 ASSA2008	41.7	51.7	41.3	53.6	33.1	50.2	36.0	48.6	31.3	44.4	b
2009 ASSA2008 female	58.1	44.2	34.5	45.4	29.3	46.1	29.5	40.8	25.7	37.4	b
2009 ASSA2008 male	53.2	59.2	48.1	61.7	36.8	54.2	42.6	56.4	36.9	51.4	b
2009 RMS	-	-	-	-	-	-	-	-	-	46.0	d
2009 RMS female	-	-	-	-	-	-	-	-	-	40.0	d
2009 RMS male	-	-	-	-	-	-	-	-	-	52.0	d
2010 ASSA2008	40.0	49.0	40.0	52.0	33.5	47.6	36.7	46.3	31.9	43.1	b
2010 ASSA2008 female	53.5	41.1	33.7	44.0	29.3	42.9	30.4	38.6	26.5	36.3	b
2010 ASSA2008 male	50.9	56.8	46.3	60.0	37.8	52.2	43.0	54.0	37.4	50.0	b
2010 GBD 2010 female	-	-	-	-	-	-	-	-	-	35.0	a
2010 GBD 2010 male	-	-	-	-	-	-	-	-	-	44.1	a
2010 RMS	-	-	-	-	-	-	-	-	-	43.0	d
2010 RMS female	-	-	-	-	-	-	-	-	-	37.0	d
2010 RMS male	-	-	-	-	-	-	-	-	-	49.0	d
2011 ASSA2008	39.4	47.2	39.4	51.3	33.9	46.1	37.2	44.8	32.5	42.6	b
2011 ASSA2008 female	46.0	39.6	33.5	43.6	29.5	41.3	31.2	37.6	27.2	36.1	b
2011 ASSA2008 male	46.6	54.8	45.3	59.0	38.4	51.0	43.2	52.1	37.7	49.2	b
2011 RMS	-	-	-	-	-	-	-	-	-	40.0	d
2011 RMS female	-	-	-	-	-	-	-	-	-	34.0	d
2011 RMS male	-	-	-	-	-	-	-	-	-	46.0	d
2012 ASSA2008	40.1	46.3	39.2	51.1	34.3	45.5	37.6	44.1	32.9	42.5	b
2012 ASSA2008 female	46.1	39.0	33.8	43.7	29.8	40.8	31.9	37.3	27.9	36.2	b
2012 ASSA2008 male	46.4	53.5	44.7	58.4	38.7	50.3	43.3	50.8	37.9	48.8	b
2013 ASSA2008	40.5	45.8	39.2	51.1	34.5	45.4	37.9	43.7	33.3	42.6	b
2013 ASSA2008 female	53.3	38.9	34.2	44.1	30.2	40.8	32.5	37.5	28.5	36.7	b
2013 ASSA2008 male	46.5	52.7	44.3	58.1	38.9	49.9	43.4	50.0	38.0	48.6	b
Life expectancy at birth											
2001 StatsSA	-	-	-	-	-	-	-	-	-	55.1	e
2001 StatsSA female	-	-	-	-	-	-	-	-	-	57.8	e
2001 StatsSA male	-	-	-	-	-	-	-	-	-	52.1	e
2003 Hlabisa DSS	-	-	-	49.2	-	-	-	-	-	-	f
2007 ASSA2008	52.1	51.2	57.2	49.0	60.5	51.4	60.5	55.0	64.0	55.1	b
2007 ASSA2008 female	55.3	54.3	60.2	52.2	62.7	53.1	64.1	59.0	67.5	58.3	b
2007 ASSA2008 male	49.0	48.2	54.1	45.9	58.4	49.8	56.9	51.2	60.7	51.9	b
2007 StatsSA	-	-	-	-	-	-	-	-	-	53.0	e
2007 StatsSA female	-	-	-	-	-	-	-	-	-	54.9	e
2007 StatsSA male	-	-	-	-	-	-	-	-	-	50.9	e
2009 ASSA2008	54.4	53.8	59.8	52.7	63.2	54.2	61.8	56.4	65.0	57.6	b
2009 ASSA2008 female	57.7	57.1	63.1	56.1	65.8	56.2	65.3	59.7	68.3	60.9	b
2009 ASSA2008 male	51.2	50.6	56.7	49.2	60.7	52.3	58.4	53.1	61.7	54.3	b
2009 RMS	-	-	-	-	-	-	-	-	-	56.5	d
2009 RMS female	-	-	-	-	-	-	-	-	-	59.0	d
2009 RMS male	-	-	-	-	-	-	-	-	-	54.0	d
2009 StatsSA	-	-	-	-	-	-	-	-	-	55.5	e
2009 StatsSA female	-	-	-	-	-	-	-	-	-	57.5	e
2009 StatsSA male	-	-	-	-	-	-	-	-	-	53.3	e
2010 ASSA2008	55.2	55.1	60.3	53.4	63.0	55.6	61.6	57.2	64.7	58.2	b
2010 ASSA2008 female	58.7	58.7	63.4	56.9	65.8	57.9	64.9	60.6	68.0	61.5	b
2010 ASSA2008 male	51.8	51.6	57.2	49.9	60.3	53.3	58.3	53.8	61.5	54.9	b
2010 RMS	-	-	-	-	-	-	-	-	-	57.8	d
2010 RMS female	-	-	-	-	-	-	-	-	-	60.3	d
2010 RMS male	-	-	-	-	-	-	-	-	-	55.3	d

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
2010 StatsSA	-	-	-	-	-	-	-	-	-	56.5	e
2010 StatsSA female	-	-	-	-	-	-	-	-	-	58.5	e
2010 StatsSA male	-	-	-	-	-	-	-	-	-	54.3	e
2011 ASSA2008	55.7	56.0	60.5	53.8	62.9	56.4	61.4	57.8	64.6	58.4	b
2011 ASSA2008 female	59.1	59.5	63.5	57.3	65.7	58.9	64.7	61.1	67.7	61.7	b
2011 ASSA2008 male	52.2	52.5	57.6	50.3	60.1	54.0	58.2	54.5	61.5	55.2	b
2011 Hlabisa DSS	-	-	-	60.5	-	-	-	-	-	-	f
2011 RMS	-	-	-	-	-	-	-	-	-	59.6	d
2011 RMS female	-	-	-	-	-	-	-	-	-	62.4	d
2011 RMS male	-	-	-	-	-	-	-	-	-	56.9	d
2011 StatsSA	-	-	-	-	-	-	-	-	-	57.1	e
2011 StatsSA female	-	-	-	-	-	-	-	-	-	59.1	e
2011 StatsSA male	-	-	-	-	-	-	-	-	-	54.9	e
2012 ASSA2008	55.9	56.4	60.6	53.9	62.8	56.8	61.4	58.1	64.5	58.5	b
2012 ASSA2008 female	59.3	59.9	63.5	57.3	65.7	59.3	64.5	61.3	67.5	61.7	b
2012 ASSA2008 male	52.4	53.0	57.8	50.6	60.0	54.3	58.3	55.0	61.5	55.4	b
2013 ASSA2008	56.0	56.6	60.7	54.0	62.7	57.0	61.3	58.3	64.4	58.5	b
2013 ASSA2008 female	59.4	60.0	63.4	57.3	65.6	59.4	64.4	61.3	67.4	61.6	b
2013 ASSA2008 male	52.6	53.3	58.0	50.8	60.0	54.5	58.3	55.3	61.5	55.5	b

Reference notes (indicator definitions from page 310 and references from page 315):

- a Global Burden of Disease 2010.⁶¹
- b ASSA2008.⁶²
- c NiDS Demography Wave 1.⁴²
- d RMS 2011.⁵⁹
- e StatsSA Mid-year estimates.³⁴ 2011 mid-year estimates. Life expectancy assumptions used in development of the current mid-year estimates.
- f Bor et al. 2013.⁵⁵

Disability

Context	Interpreting measures of the prevalence of disability over time require careful attention to the exact definitions used and the means by which responses are elicited in various surveys. The questions used in the StatsSA General Household Survey remain as introduced in 2009.
New data sources	Nationally, new data have been reported in the: <ul style="list-style-type: none"> • StatsSA General Household Survey (GHS) 2011 • StatsSA Census 2011 • District Health Information System (DHIS) (cataract surgery indicator) Internationally, reports of interest include: <ul style="list-style-type: none"> • Global Burden of Disease Study 2010
Key issues and trends	At a global level, enormous amounts of data have been produced for the Global Burden of Disease Study 2010, including data on the burden accounted for by disabilities.

Two of the major papers that were produced from the Global Burden of Disease Study 2010 were entitled “Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010” and “Years lived with disability (YLDs) for 1 160 sequelae of 289 diseases and injuries, 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010”.^{63,64} The first of these presented a composite measure (disability adjusted life years or DALY) as the sum of the years of life lost (YLLs) and years lived with disability (YLDs) due to 291 causes, in 20 different age groups, both sexes, and for 187 countries. The following explanations of these terms were provided:

- “YLLs are computed by multiplying the number of deaths at each age x by a standard life expectancy at age x ”.
- “YLDs are computed as the prevalence of different disease-sequelae and injury-sequelae multiplied by the disability weight for that sequela. Disability weights are selected on the basis of surveys of the general population about the loss of health associated with the health state related to the disease sequela”.
- “DALYs are an absolute measure of health loss; they count how many years of healthy life are lost due to death and non-fatal illness or impairment. They reflect the number of individuals who are ill or die in each age-sex group and location. Population size and composition influences the number of DALYs in a population”.

The bottom-line message from this analysis was as follows: “Global disease burden has continued to shift away from communicable to non-communicable diseases and from premature death to years lived with disability”. In this sense, ‘disability’ refers to “any short-term or long-term health loss, other than death”.

The second of the papers included estimates of the burden, expressed as YLDs, due to causes that are more commonly defined as disabilities. For instance, visual impairment accounted for 21.1 million YLDs or 2.7% of the global total. The most common causes of vision loss were trauma, occupational exposures, and idiopathic disorders. These were followed by uncorrected refractive error and cataracts. In terms of hearing loss, a substantial increase was detected from 1990 to 2010, driven by an ageing population. However, most of the burden of hearing loss, as measured by YLDs, was of mild-to-moderate severity. Intellectual disability and borderline intellectual impairment were responsible for 3.1 million

YLDs. At a global level, the main causes were idiopathic, Down’s syndrome, autism, preterm birth, and other congenital disorders, but there were major regional differences. Major preventable causes, for instances, included meningitis in west and central sub-Saharan Africa and cretinism in south Asia.

An analysis of the cost-effectiveness of strategies to combat vision and hearing loss in sub-Saharan Africa and South East Asia identified the treatment of chronic otitis media, extracapsular cataract surgery, trichiasis surgery, treatment of meningitis and annual screening of schoolchildren for refractive error as among the most cost effective.⁶⁵ Some of these are already applied in South Africa’s public sector, but others may provide fruitful targets for the new Integrated School Health Programme.

The StatsSA General Household Survey 2011 reported that the percentage of persons over the age of five years with disabilities had increased from 5.7% in 2009 to 6.3% in 2010 before declining to 5.2% in 2011.³⁷ In 2011, the highest reported prevalence of disability was in the Northern Cape (10.1%), and the lowest in Gauteng (3.3%). As explained in the StatsSA report, the questions posed to respondents “require each person in the household to rate their ability level for a range of activities such as seeing, hearing, walking a kilometre or climbing a flight of steps, remembering and concentrating, self-care, and communicating in his/her most commonly used language, including sign language”. If respondents state that they have difficulty with two or more of the activities or had a lot of difficulty/were unable to perform any one activity, they are then recorded as disabled.

StatsSA collected data on disability status in the censuses of 1996 and 2001 and in the large scale community survey conducted in February 2007. In each case, the definition of disability was that used by the 1980 WHO International Classification of Impairments, Disabilities and Handicaps (ICIDH), accordingly as a physical or mental handicap which has lasted for six months or more, or is expected to last at least six months, which prevents the person from carrying out daily activities independently, or from participating fully in educational, economic or social activities. From 2010, censuses have adopted a set of disability questions developed by the Washington Group (WG). These questions relate to difficulties people have in executing a series of activities; seeing, hearing, walking, communicating, and self-care, remembering and concentrating. Studies carried out prior to the Census 2011 showed that the use of WG questions led to much higher disability estimates

compared to the traditional questions and that the term 'difficulty' instead of 'disabled' seemed to be more acceptable among persons with impairments which do not prevent them from participating in life activities. However, as a result of the changes in the format of the disability questions, the Census 2011 data are not comparable with those from previous censuses.³³ Although some of the Census 2011 figures relating to disability have been released, the overall calculated prevalence of disability has not yet been published and is thus not included in this Review.

At a very local level, a cross-sectional study was conducted to determine the prevalence and causes of vision loss in Cape Town residents over the age of 50 years.⁶⁶ This was a large study, which recruited 2 750 of 3 100 eligible people in a randomly selected sample. As expected, the prevalence of vision loss was greatest among people over 80 years of age, but also in those in the poorest socio-economic group and those with no formal education. The socio-economic gradient was also evident in terms of access to cataract surgery, which was 68% coverage in the poorest socio-economic status tertile (68%) compared to 93% in the medium and 100% in the highest tertile.

Indicators for routine monitoring of cataract surgery services are in a state of flux. Previously, provincial-level data were collected by the national department and the rate per million uninsured population was calculated. More recently, the data have been collected by DHIS. However, data prior to 2011/12 were clearly incomplete. In addition, the current DHIS calculations use the 2010 National Indicator Data Set (NIDS) definition, in which the 'total population' is used as the denominator. The definition in the 2013 NIDS has been corrected to use the uninsured population as the denominator. Regardless of the definitions used, it is clear that coverage at a national level is substantially below the target, and that disaggregated data show that several areas of the country provide no cataract surgery services in the public sector.⁶⁷

Table 5: Disability indicators by province

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Cataract surgery rate (annualised)											
2009	603.9	422.3	30.3	198.6	689.3	588.3	-	25.3	1 067.0	387.6	a
2010	784.4	899.5	213.5	319.5	717.5	604.1	259.0	468.8	1 094.0	547.6	a
2011	1 002.1	821.3	555.6	633.6	765.3	629.4	416.7	363.9	1 209.7	729.5	b
Cataract surgery rate (surgeries per million uninsured population)											
2009	1 030	916	1 574	840	823	1 051	396	777	1 485	1 072	c
2010	1 102	1 329	1 345	681	717	962	471	778	1 501	1 016	c
Prevalence of disability (%)											
2009 GHS	5.3	9.1	5.3	7.7	4.8	3.7	5.6	4.9	4.0	5.7	d
2010 GHS	7.9	10.1	3.3	6.6	8.2	5.0	9.8	8.5	5.0	6.3	e
2011 GHS	6.1	6.7	3.3	4.6	6.1	5.5	10.2	7.7	4.4	5.2	f

Reference notes (indicator definitions from page 310 and references from page 315):

- a DHIS. Incomplete data. For 2009/10 and 2010/11 financial years.
- b DHIS. Total surgeries: 36 862. For 2011/12 financial year.
- c DoH. Total surgeries: 43 943 in 2009 and 41 863 in 2010. Uninsured population for the relevant year calculated from the most recent available data from StatsSA on mid-year population estimates and medical scheme coverage (General Household Surveys).
- d StatsSA GHS 2009 revised.⁶⁸ The question asks each person in the household to rate their ability level for a range of activities. These include: seeing, hearing, walking a kilometre or climbing a flight of steps, remembering and concentrating, self-care and communicating in his/her most commonly used language, including sign language. During the analysis individuals who said that they had some difficulty in two or more of the activities or a lot of difficulty/unable to do in any one activity were then ranked as disabled. Since this question is very different from the question asked in previous surveys, no comparison over time is possible. Note that this analysis only includes the percentage of persons aged 5 years and older with a disability. This is because children under five years are often mistakenly categorised as being unable to walk, remember, communicate or care for themselves when it is due to their level of development rather than any innate disabilities they might have.
- e StatsSA GHS 2010.⁶⁹ This analysis only includes the percentage of persons aged 5 years and older with a disability.
- f StatsSA GHS 2011.³⁷ This analysis only includes the percentage of persons aged 5 years and older with a disability.

Infectious disease

Context	Traditionally, some of the most important data on infectious disease incidence were provided by the National Department of Health's Notifiable Disease system. That system seems to have broken down completely and no reports have been issued for some time. The only sources of data now available are the various reports issued by the National Institute for Communicable Diseases (NICD).
New data sources	Nationally, new data have been reported in the: <ul style="list-style-type: none"> • The National Antenatal Sentinel HIV and Syphilis Prevalence Survey, 2011 • Surveillance data, surveillance bulletins and other reports issued by NICD Internationally, reports of interest include: <ul style="list-style-type: none"> • Sustaining the drive to overcome the global impact of neglected tropical diseases: Second WHO report on neglected tropical diseases
Key issues and trends	A major change in relation to syphilis surveillance is planned from 2013, when this element of the annual Antenatal Sentinel HIV Prevalence Survey will be replaced with a focus on herpes simplex 2 infections.

As was indicated in the 2011 edition of the *SA Health Review*,¹ no new national data on the incidence of most notifiable conditions can be provided, as no data have been reported from the National Department of Health. There is no evidence that the web-based system introduced for the World Cup in 2010 has survived and been rolled out as planned.⁷⁰ However, some data on these conditions have been reported by the National Institute for Communicable Diseases (NICD), based on positive identification by their laboratories or surveillance sites or following their involvement in investigations of outbreaks. An example is the article summarising rabies data for 2005 to 2011, which appeared in the April 2012 issue of the NICD Communicable Disease Surveillance Bulletin.⁷¹

A major change in the availability of syphilis data will occur after 2011. The National Antenatal Sentinel HIV and Syphilis Prevalence Survey conducted in 2011 enrolled 33 446 first time antenatal care attendees at selected public sector facilities in all 52 districts.⁷² Each provided a sample for a Rapid Plasma Reagin (RPR) card test for active syphilis. The national prevalence of syphilis in 2011 was 1.6% (95% CI: 1.5-1.8), with the highest prevalence noted in Mpumalanga rather than the Northern Cape. However, from the 2012 survey, monitoring of syphilis prevalence among pregnant women will cease. Instead, the focus will be on monitoring of herpes simplex type 2 (HSV2). Data from selected pilot sites will be included in the 2012 report. However, routine testing for syphilis will still be conducted as part of antenatal care, although data will no longer be captured by the antenatal survey or reported by the DHIS.

Globally, progress in attaining the goal of reducing measles-associated mortality by 90% by 2010 has been documented.⁷³ Despite an estimated 74% reduction in global mortality from measles between 2000 and 2010, further progress has been hampered by the lack of action in India and some parts of Africa. In 2010, India accounted for almost half of all measles-associated mortality and the WHO African region for more than a third.

Although South Africa is not particularly burdened by such conditions, the second WHO report on neglected tropical diseases did a high prevalence of human cysticercosis cases in some parts of the country.⁷⁴ Neurocysticercosis may be fatal and is also an important cause of epilepsy. Cysticercosis, neurocysticercosis and taeniasis were added to the list of neglected tropical diseases by WHO in 2010. A validated strategy for controlling and eliminating these conditions is planned to be developed by 2015, and then implemented at scale in selected endemic countries by 2020.

Table 6: Selected infectious disease indicators by province

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Reported cases of cholera											
2010 NICD lab confirmed cases	-	-	1	-	-	-	-	-	-	1	a
2011 NICD lab confirmed cases	-	-	-	-	1	-	-	-	-	1	b
2012 NICD lab confirmed cases	-	-	-	-	-	-	-	-	-	0	c
Reported cases of measles											
2010 NICD lab confirmed cases	1 309	674	1 617	3 837	290	1 844	374	758	1 796	12 499	a
2011 NICD lab confirmed cases	4	2	36	23	1	2	8	8	8	92	b
2012 NICD lab confirmed cases	0	1	7	6	1	0	0	1	1	17	c
Reported cases of rabies											
2010 NICD lab confirmed cases	2	0	1	3	3	1	1	0	0	11	a
2011 NICD lab confirmed cases	2	0	0	1	3	0	0	0	0	6	b
2012 NICD lab confirmed cases	0	0	0	4	3	1	0	0	0	8	c
Syphilis prevalence rate (%) (antenatal)											
2010 ANC survey	2.1	1.2	2.8	0.3	0.5	2.1	3.6	1.3	1.2	[10] 1.5	d
2011 ANC survey	1.8	1.9	2.0	0.4	0.7	4.1	3.8	1.7	1.6	[11] 1.6	e

Reference notes (indicator definitions from page 310 and references from page 315):

- a NICD surveillance. Communicable Diseases Surveillance Bulletin Mar 2011.⁷⁵ Data for Jan-Dec 2010.
- b NICD surveillance. Communicable Diseases Surveillance Bulletin Apr 2012.⁷¹ Data for Jan-Dec 2011.
- c NICD surveillance. Communicable Diseases Surveillance Bulletin Nov 2012.⁷⁶ Data for Jan-Sep 2012.
- d Antenatal Survey 2010.⁷⁷
- e Antenatal Survey 2011.⁷²

Malaria

Context	Although malaria is only endemic in three provinces (KwaZulu-Natal, Mpumalanga, Limpopo), cases are increasingly being reported in other provinces. Many of these patients appear to have contracted malaria in neighbouring countries, but sought care in South Africa (notably in Gauteng).
New data sources	Nationally, new data have been reported in the: <ul style="list-style-type: none"> • NDoH malaria surveillance • StatsSA Causes of Death 2009 Internationally, reports of interest include: <ul style="list-style-type: none"> • WHO World Malaria Reports 2011 and 2012
Key issues and trends	Globally, attention has been focused on the markedly increases estimates of malaria mortality published by the Institute for Health Metrics and Evaluation (IHME).

The WHO World Malaria report for 2012 shows that just 4% of the South African population is at high transmission risk (defined as ≥ 1 case per 1 000 population), 6% at low risk (0-1 case per 1 000 population), while the balance resides in malaria-free areas.⁷⁸ Interventions are thus concentrated in the three malaria-endemic provinces (KwaZulu-Natal, Mpumalanga, Limpopo). The WHO report did note, however, that South Africa was one of only five countries in which domestic expenditure per capita on malaria control (based on the population at risk) exceeded US\$ 5.00 per capita per year. The other countries in this group were Azerbaijan, Costa Rica, Malaysia, and Turkey. The WHO also reported that: "In the African Region, only 8 countries (Algeria, Botswana, Cape Verde, Namibia, Rwanda, Sao Tome and Principe, South Africa and Swaziland) and the island of Zanzibar (United Republic of Tanzania) have achieved reductions in malaria case incidence or malaria admission rates of 75% or more". While noting that malaria has been a notifiable disease in South Africa since 1956, Moonasar et al. have pointed out that the National Department of Health's surveillance of malaria has always had to deal with "irregularity of routine notifications, particularly from the private sector and public health facilities in non-endemic areas".⁷⁹ However, these authors have also noted that, "reporting appears to be gaining in efficiency, with an increase in malaria notifications from the non-endemic areas, especially Gauteng". In 2010, malaria cases were reported from all nine provinces, with the number reported in Gauteng (960) exceeding the number reported in KwaZulu-Natal (380). The majority of cases were still reported in Limpopo (4 215) and Mpumalanga (2 195). The peak number of malaria-related deaths in Gauteng were recorded in January of each year, presumably related to travellers returning from malaria-endemic areas, particularly Mozambique. A review of malaria data from Mpumalanga for the period 2001 to 2009 showed that this province had reduced malaria morbidity and mortality by over 70%, but that it still faces challenges in terms of the "control of imported malaria cases; development of strategies to interrupt local transmission; and maintaining high quality surveillance and reporting system".⁸⁰

Globally, the cat was set among the proverbial pigeons by a report published in February 2012 from the Institute for Health Metrics and Evaluation (IHME).⁵² The IHME team used data from a variety of sources, including vital registration systems, published and unpublished verbal autopsy reports, and estimates of malaria transmission intensity, and then constructed a range of predictive models. Other factors included were data on *Plasmodium falciparum* prevalence, first-line antimalarial drug resistance and

vector control. In essence, the study suggested that there were about twice as many deaths from malaria that had been estimated in the WHO World Malaria Report 2011.⁸¹ An accompanying editorial in the Lancet called these results "surprising and, on the face of it, disturbing".⁸² The editorialist spoke for many when writing: "The authors will need to make their data and assumptions fully available to others who will surely wish to reproduce their calculations". Nonetheless, the Lancet called for "urgent technical and policy analyses to review these new data and their implications for malaria control programmes".

Table 7: Malaria indicators by province

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Case fatality rate: malaria											
2010	0.0	0.0	1.1	1.3	0.9	1.2	8.3	2.2	0.0	1.1	a
2011	1.3	0.0	1.4	1.0	0.9	0.5	4.5	1.2	1.1	0.9	a
2012	0.0	0.0	2.0	0.6	0.8	0.5	4.0	0.0	0.0	0.9	b
Reported cases of malaria											
2010	9	34	960	380	4 215	2 195	12	186	75	8 066	a
2011	156	81	2 080	598	3 451	3 259	66	85	89	9 865	a
2012	2	34	1 136	355	1 642	2 074	25	17	1	5 286	b
Reported cases of malaria (per 100 000)											
2010	0.1	1.2	8.6	3.6	77.5	60.7	1.1	5.8	1.4	16.1	a
2011	2.3	2.9	18.4	5.5	62.1	89.1	6.0	2.6	1.7	19.5	a
2012	0.0	1.2	10.2	3.3	31.1	56.2	2.2	0.5	0.0	10.4	b
Reported deaths from malaria											
2007 DoH surveillance	-	-	-	5	29	17	-	-	-	51	c
2007 Vital Registration	4	10	74	33	59	58	4	21	8	278	d
2008 DoH surveillance	-	-	-	3	31	8	-	1	-	43	a
2008 Vital Registration	8	7	92	22	79	33	2	21	4	279	e
2009 DoH surveillance	-	-	-	4	34	11	-	2	-	51	a
2009 Vital Registration	5	7	61	18	70	31	1	12	4	222	f
2010 DoH surveillance	0	0	11	5	40	26	1	4	0	87	a
2011 DoH surveillance	2	0	29	6	31	16	3	1	1	89	a
2012 DoH surveillance	0	0	23	2	13	10	1	0	0	49	b

Reference notes (indicator definitions from page 310 and references from page 315):

- a DoH Malaria Statistics. Data file received 2012-08-28. Data for Jan-Dec.
- b DoH Malaria Statistics. Data file received 2012-08-28. Data for Jan-Jul.
- c DoH Malaria Statistics. Data file received 2010-10-28.
- d StatsSA Causes of death 2007.⁸³ Calculated from StatsSA Causes of Death online database using ICD-10 codes B50-B54 as underlying cause of death. Includes deaths occurring outside of SA.
- e StatsSA Causes of death 2008.⁸⁴ Calculated from StatsSA Causes of Death online database using ICD-10 codes B50-B54 as underlying cause of death. Includes deaths occurring outside of SA.
- f StatsSA Causes of death 2009.⁵³ Calculated from StatsSA Causes of Death online database using ICD-10 codes B50-B54 as underlying cause of death. Includes 13 deaths occurring outside of SA.

Tuberculosis

Context	South Africa is one of the countries most affected by tuberculosis, with significant numbers of drug-resistant cases. An integrated approach to the management of HIV and TB is promoted in South Africa, but many systems remain fragmented.
New data sources	Nationally, new data have been reported in the: <ul style="list-style-type: none"> • NDoH Electronic Tuberculosis Register (ETR) • StatsSA Causes of Death 2009 Internationally, reports of interest include: <ul style="list-style-type: none"> • WHO Global Tuberculosis Report 2012
Key issues and trends	Although treatment success rates in South Africa's public sector TB programme have remained below target, the country has been recognised for the progress being made in relation to expanding access to isoniazid preventive therapy in HIV-positive patients and the early adoption of the Xpert MTB/RIF rapid molecular test. The use of this technology at scale is predicted to markedly increase the numbers of TB cases and MDR-TB cases diagnosed in South Africa. However, the diagnosis and management of children with TB remains challenging for many reasons.

Tuberculosis provides a perfect example of how averages can obscure real problems. The WHO Global Tuberculosis Report 2012 optimistically reported that the MDG target to halt and reverse the TB epidemic by 2015 had already been achieved.⁸⁵ It noted that the TB mortality rate had decreased by 41% since 1990 and that "the world is on track to achieve the global target of a 50% reduction by 2015". Despite these positive statements, the Report also noted that "the global burden of TB remains enormous", in that there were an estimated 8.7 million new cases of TB in 2011, of which 13% were co-infected with HIV, and 1.4 million TB-associated deaths. Critically, it noted that "[g]lobal progress also conceals regional variations: the African and European regions are not on track to halve 1990 levels of mortality by 2015". Resistance is also a concern. While the highest proportions of patients with MDR-TB are in eastern Europe and central Asia, just 4 countries (India, China, Russia and South Africa) account for almost 60% of the world's MDR-TB cases. South Africa remains one of the 22 high-burden countries (the others being Afghanistan, Bangladesh, Brazil, Cambodia, China, the Democratic Republic of the Congo, Ethiopia, India, Indonesia, Kenya, Mozambique, Myanmar, Nigeria, Pakistan, the Philippines, the Russian Federation, Thailand, Uganda, the United Republic of Tanzania, Vietnam and Zimbabwe). In raw numbers, the largest number of incident cases in 2011 were reported in India (2.0 million-2.5 million), China (0.9 million-1.1 million), South Africa (0.4 million-0.6 million), Indonesia (0.4 million-0.5 million) and Pakistan (0.3 million-0.5 million). South Africa is also one of only seven high-burden countries which have failed to achieve the target of 85% treatment success for smear-positive pulmonary TB cases. The recorded success rates were: Brazil (74%), Ethiopia (83%), Nigeria (84%), the Russian Federation (53%), South Africa (79%), Uganda (71%) and Zimbabwe (81%). Success rates were even lower when expressed as a percentage of all new cases, with Brazil (72%), Ethiopia (77%), Nigeria (81%), the Russian Federation (66%), South Africa (53%), Thailand (83%), Uganda (68%) and Zimbabwe (76%) missing the target. However, the Report did contain a footnote to the effect that the South African data reported to WHO were incomplete, and that the figure of 53% was thus an underestimate. The costs of successfully treating a case with first-line agents is higher in South Africa and Russia than in any of the other high-burden countries. In addition, there are no reliable data on the expenditure on second-line agents in both of these countries. Nonetheless, some positive developments

were also noted, such as the contribution made by South Africa to increasing access to isoniazid preventive therapy in HIV-positive patients and in the early adoption of the Xpert MTB/RIF rapid molecular test. As of June 2012, South Africa was responsible for 37% of the Xpert instruments and 53% of the cartridges procured globally. The country has been able to gain from the significant reduction (from US\$ 16.86 to US\$ 9.98) enabled by a 'buy-down' deal struck between the manufacturer (Cepheid) and external funders (including the Gates Foundation, USAID, PEPFAR and UNITAID) in August 2012. It has been estimated that, at full scale, the application of the Xpert technology will increase the number of TB cases diagnosed per year in South Africa by 30-37% and the number of MDR-TB cases diagnosed by 69-71%.⁸⁶

A review of available data on anti-tuberculosis drug resistance for the 2007-2010 period was published in late 2011.⁸⁷ This showed that, on the basis of the available data, the proportion of MDR-TB cases that were extensively drug-resistant (XDR-TB) exceeded 10% in only four countries, being South Africa (10.5%), Estonia (19.7%), Latvia (15.1%), and Tajikistan (21.0%, as reported for one city and one district).

An area of persistent neglect, which was highlighted by an editorial in the Bulletin of the World Health Organization in 2011, is that of the diagnosis and treatment of TB in children.⁸⁸ Estimates of the numbers of children with TB were included for the first time in the WHO Global Tuberculosis Report 2012. The global estimate was of 490 000 cases and 64 000 deaths among children in 2011.

Although South Africa has an integrated policy document for the management of HIV, TB and sexually transmitted diseases,¹³ integration at the level of care remains a challenge, and information systems are also separate. In reviewing the African response to TB and HIV in 2006, Corbett et al. made the trenchant observation that "[t]uberculosis control in Africa has yet to adapt to the new climate of antiretroviral availability".⁸⁹ Further, they have noted that "[m]any barriers exist, from drug interactions to historic differences in the way that tuberculosis and HIV are perceived, but failure to successfully integrate HIV and tuberculosis control will threaten the viability of both programmes". Focusing only on the surveillance systems in a single Western cape district, Auld et al. showed that there were varying levels of completeness and concordance between data in the HIV and TB systems for co-infected patients.⁹⁰

In particular, TB clinical variables did not appear in the HIV system and vice versa. Data from interviews with the responsible staff were revealing: "Many expressed frustration that they see no local benefit to their participation in surveillance data collection, do not have access to the data collected in the electronic registers and seldom receive reports back from central levels".

The WHO Global Task Force on TB Impact Measurement has strongly recommended that 13 African and 9 Asian countries complete national TB prevalence surveys. South Africa is included in the African set, together with Ethiopia, Ghana, Kenya, Malawi, Mali, Mozambique, Nigeria, Rwanda, Sierra Leone, Uganda, the United Republic of Tanzania and Zambia. The Asian countries targeted are Bangladesh, Cambodia, China, Indonesia, Myanmar, Pakistan, the Philippines, Thailand and Vietnam.

Table 8: TB programme management and other indicators

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Case detection rate (all forms)											
2009 GlobalTB	-	-	-	-	-	-	-	-	-	74	a
2010 GlobalTB	-	-	-	-	-	-	-	-	-	72	b
2011 GlobalTB	-	-	-	-	-	-	-	-	-	69	c
HIV prevalence in TB incident cases											
2011 GlobalTB	-	-	-	-	-	-	-	-	-	65.0	c
Incidence of TB (all types) (per 100 000)											
2009 GlobalTB	-	-	-	-	-	-	-	-	-	971	a
2010 GlobalTB	-	-	-	-	-	-	-	-	-	981	b
2011 GlobalTB	-	-	-	-	-	-	-	-	-	993	c
Treatment success rate (%)											
2010 GlobalTB	-	-	-	-	-	-	-	-	-	79	c
Tuberculosis death rate per 100 000											
2008 vital registration	173	200	110	220	93	185	155	164	86	153	d
2009 vital registration	167	178	101	197	90	170	128	144	75	140	e
Tuberculosis death rate per 100 000 (excluding HIV)											
2008 GlobalTB	-	-	-	-	-	-	-	-	-	54	a
2009 GlobalTB	-	-	-	-	-	-	-	-	-	52	a
2010 GlobalTB	-	-	-	-	-	-	-	-	-	50	b
2011 GlobalTB	-	-	-	-	-	-	-	-	-	49	c
Tuberculosis prevalence rate per 100 000 population											
2009 GlobalTB	-	-	-	-	-	-	-	-	-	808	a
2010 GlobalTB	-	-	-	-	-	-	-	-	-	795	b
2011 GlobalTB	-	-	-	-	-	-	-	-	-	768	c

Reference notes (indicator definitions from page 310 and references from page 315):

- a Global TB database. Downloaded 2011-05-25.
- b Global TB Control 2011.⁹¹
- c Global TB Control 2012.⁸⁵
- d StatsSA Causes of death 2008.⁸⁴ Calculated from 74 863 deaths due to TB (ICD-10 A15-A19, U51 (MDR) and U52 (XDR TB)) and StatsSA mid-year population estimates for the relevant year. No adjustment has been made for under-reporting or ill-defined causes of death notification. The rate for South Africa includes deaths that are not allocated to a specific province and will therefore be higher than the average provincial value. Based on the recorded province of death.
- e StatsSA Causes of death 2009.⁵³ Calculated from 67 668 deaths due to TB (ICD-10 A15-A19), plus 1 184 due to ICD-10 U51 (MDR) and 151 due to ICD-10 U52 (XDR TB) and StatsSA mid-year population estimates for the relevant year. No adjustment has been made for under-reporting or ill-defined causes of death notification. The rate for South Africa includes deaths that are not allocated to a specific province and will therefore be higher than the average provincial value. Based on the recorded province of death.

Table 9: TB case finding indicators by province

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Proportion of extra-pulmonary TB											
2009 TB register	10	17	17	15	15	9	8	11	10	13	a
2010 TB register	9	17	16	15	16	9	8	10	10	13	a
2011 TB register	9	14	15	16	17	9	7	10	12	13	a
Reported cases of TB (PTB new Sm+) (per 100 000)											
2009 TB register	369.0	340.9	195.1	300.0	176.1	312.6	374.4	354.0	305.9	281.6	a
2010 TB register	349.7	329.9	202.3	262.2	178.1	263.4	304.6	332.2	296.0	264.3	a
2011 TB register	332.0	296.7	187.3	300.8	167.9	260.7	307.0	273.3	267.4	257.3	a
Reported cases of TB (PTB)											
2009 TB register	57 017	20 273	42 424	102 464	19 230	25 032	9 646	28 042	44 175	348 303	a
2010 TB register	55 744	19 917	47 060	100 421	18 365	23 217	9 435	26 706	43 805	344 670	a
2011 TB register	54 380	19 520	46 892	100 329	18 282	22 329	9 300	25 239	42 424	338 695	a
Reported cases of TB (all types)											
2009 TB register	63 807	24 940	51 660	122 642	22 836	27 511	10 503	31 682	50 118	405 699	a
2010 TB register	62 029	24 395	56 501	120 421	22 138	25 683	10 252	29 789	49 840	401 048	a
2011 TB register	60 046	22 772	55 460	118 911	22 158	24 451	10 044	28 113	48 019	389 974	a
Reported cases of TB (all types) (per 100 000)											
2009 TB register	948.2	885.9	469.9	1 162.6	424.6	767.1	956.0	997.0	976.0	820.2	a
2010 TB register	919.8	863.7	504.8	1 131.2	407.0	709.9	928.7	930.6	954.1	802.2	a
2011 TB register	902.3	777.1	496.2	1 119.5	421.1	667.7	867.3	825.5	864.6	773.3	a
Reported cases of TB (new Sm+)											
2009 TB register	24 827	9 597	21 447	31 652	9 470	11 210	4 113	11 249	15 709	139 274	a
2010 TB register	23 584	9 318	22 641	27 913	9 689	9 528	3 363	10 633	15 462	132 131	a
2011 TB register	22 093	8 693	20 936	31 952	8 835	9 545	3 555	9 307	14 854	129 770	a
Smear positivity (percentage of PTB cases which are new Sm+)											
2009 TB register	44	47	51	31	49	45	43	40	36	40	a
2010 TB register	42	47	48	28	53	41	36	40	35	38	a
2011 TB register	41	45	45	32	48	43	38	37	35	38	a

Reference notes (indicator definitions from page 310 and references from page 315):

a DoH TB.

Table 10: TB case holding indicators by province

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Cure rate (new Sm+ cases) (%)											
2008 TB register	60.9	70.9	78.7	62.9	66.7	64.5	65.6	58.3	79.4	67.5	a
2009 TB register	66.0	71.4	79.0	66.3	70.3	73.0	69.7	64.6	80.9	71.1	a
2010 TB register	67.1	73.0	78.2	71.3	74.7	72.6	70.9	66.6	81.7	73.1	a
Defaulter (interruption) rate (new Sm+ cases) (%)											
2008 TB register	7.5	4.7	5.9	8.3	7.9	8.2	5.8	9.3	8.2	7.5	a
2009 TB register	7.8	4.6	6.3	7.3	7.7	7.1	5.8	8.7	7.1	7.1	a
2010 TB register	7.8	4.8	5.5	7.2	6.0	7.5	6.4	8.8	6.8	6.8	a
Smear conversion rate (new Sm+ cases) (%)											
2008 TB register	58.1	73.2	77.0	57.3	58.5	59.0	55.5	48.7	70.6	62.5	a
2009 TB register	61.2	72.9	78.6	61.1	63.0	69.5	66.8	53.3	74.9	66.5	a
2010 TB register	60.6	73.5	80.1	66.6	65.1	60.3	70.8	55.5	75.5	68.1	a
2011 TB register	65.9	73.3	81.9	72.1	70.5	67.9	70.5	59.6	74.5	71.7	a
Successful completion rate (new Sm+) (%)											
2008 TB register	77.1	76.8	80.8	74.0	74.1	70.3	79.2	69.4	83.5	76.4	a
2009 TB register	76.9	76.4	80.0	73.8	74.5	77.4	80.4	73.4	83.3	77.1	a
2010 TB register	76.9	77.8	82.3	77.6	77.0	76.4	80.9	74.8	85.0	78.9	a

Reference notes (indicator definitions from page 310 and references from page 315):

a DoH TB.

HIV and AIDS

Context	Instead of reflecting a deep and divisive rift, data on HIV and AIDS are now openly discussed, and the considerable gains made are celebrated as evidence of the impact of new leadership and a healed polity. Challenges remain, but are faced openly and with visible commitment.
New data sources	Nationally, new data have been reported in the: <ul style="list-style-type: none"> • The National Antenatal Sentinel HIV and Syphilis Prevalence Survey, 2011 • First (2010) and Second (2011) South African Prevention of Mother-to-Child Transmission Evaluations • Comprehensive Care Management and Treatment (CCMT) statistics • National Health Laboratory Service data on PCR tests • Third South African National Communication Survey 2012 Internationally, reports of interest include: <ul style="list-style-type: none"> • UNAIDS Report on the Global AIDS Epidemic 2012 • UNAIDS/MSF Speed Up Scale Up. Strategies, tools and policies to get the best HIV treatment to more people, sooner, 2012
Key issues and trends	The National Strategic Plan for HIV and AIDS, STIs and TB, 2012-2016 has set an array of targets, not all of which are easily measured. Nonetheless, there is good evidence to show that significant gains have already been made in relation to preventing mother-to-child transmission. There is also evidence of an effect on life expectancy. Integrating monitoring and evaluation systems for HIV into the mainstream systems remains a challenge at all levels.

South Africa's path from pariah status in the eyes of the HIV world to recognition of the progress made, notably in relation to mother-to-child transmission, but also in relation to the sheer size of the public sector antiretroviral treatment (ART) programme has been well documented.⁹² The same editorial also provided more details on the planned rollout of the 'tiered' system for capturing ART-related data. This system, adopted by the National Health Council in December 2010 encompasses a paper-based system (tier 1; based on the Western Cape's model), a non-networked electronic register (tier 2) and a networked electronic register (tier 3). The aim was to have an electronic register working in at least one facility per district by March 2012. These plans need to be borne in mind when reading the report of a study of the HIV monitoring and evaluation system which was published in 2012.⁹³ It was conducted in a single district in a largely rural province in April to July 2009. It described a plethora of paper-based parallel systems. In addition, facility staff in the district devised their own forms. This vertically-designed system was, at best, partially integrated with the DHIS. The authors' concluding remarks are worth considering, even in the light of the TIER.net developments: "We view M&E integration as being about more than just merging data recording forms and reporting and dissemination mechanisms. It is about breaking away from historical silo funding that promotes disease-specific M&E systems over strengthening overall health information systems and about building the capacity of HIS personnel and health system managers to take on programme-specific M&E coordination responsibilities. It is an incremental learning process that will require political commitment and investment of time and resources. Leveraging earmarked HIV funding to provide the needed resources to build overall HIS capacity is a practical way of translating health system strengthening intents of national HIV policy into tangible action."

The goals set for the National Strategic Plan for HIV and AIDS, STIs and TB, 2012-2016 are driven by the UNAIDS "Three Zeros" vision (adapted locally as "Zero new HIV and TB infections; Zero new infections due to vertical transmission; Zero preventable deaths associated with HIV and TB; Zero discrimination associated with

HIV and TB").¹³ Specifically, the goals for the current strategic plan are:

- "Reduce new HIV infections by at least 50% using combination prevention approaches;
- Initiate at least 80% of eligible patients on antiretroviral treatment (ART), with 70% alive and on treatment five years after initiation;
- Reduce the number of new TB infections as well as deaths from TB by 50%;
- Ensure an enabling and accessible legal framework that protects and promotes human rights in order to support implementation of the NSP; and
- Reduce self-reported stigma related to HIV and TB by at least 50%."

The strategy also includes a set of indicators, with clear definitions, sources, baselines and targets for 2016 for most of the proposed measures. Tools for the measurement of the impact on stigma were, however, left to be devised later.

The starting point for much of what is known about the HIV pandemic at a particular point in time is the National Antenatal Sentinel HIV and Syphilis Prevalence Survey. The 2011 report covered the 22nd such national survey conducted in South Africa and included data from 33 446 first time antenatal care attendees at 1 445 public sector antenatal clinics.⁷² In 2011, the estimated national HIV prevalence was 29.5% (95% CI: 28.7-30.2%). Although this was reported as a decrease of 0.7% in the point estimate, this was within the 95% confidence intervals for the estimate recorded in 2010 (30.2%; 95% CI: 29.4-30.9), and did not differ significantly from the estimates for 2007 to 2009. By this measure, the prevalence of HIV infections among pregnant women aged 15-49 years attending public sector clinics is stubbornly stable. Only in KwaZulu-Natal did there appear to be a significant reduction in prevalence. Based on the UNAIDS SPECTRUM model, the estimated national HIV prevalence among the general adult

population aged 15-49 years old had also remained stable (at around 17.3%) since 2005, and the total number of people living with HIV in South Africa was estimated as 5 600 000 [5 300 000-5 900 000] in 2011. A cross-sectional biomarker survey (which included markers diabetes and cholesterol as well as HIV testing of dried blood spot specimens) in the Agincourt DSS reported an HIV prevalence of 19.4% in those aged 15 years and older in 2010-11 in this rural setting.⁹⁴

Despite the lack of progress noted with antenatal prevalence of HIV, there is evidence of significant reductions in mother-to-child transmission. The evidence was summarised by Barron et al. as follows: "Between 2008 and 2011, the estimated proportion of HIV-exposed infants younger than 2 months who underwent routine polymerase chain reaction (PCR) tests to detect early HIV transmission increased from 36.6% to 70.4%. The estimated HIV transmission rate decreased from 9.6% to 2.8%. Population-based surveys in 2010 and 2011 reported transmission rates of 3.5% and 2.7%, respectively".⁹⁵ One of the contributory factors to this success was claimed to be "making use of data and indicators on all aspects of the PMTCT programme". However, these authors did also admit that "[s]ome health districts have done better than others in ensuring that good quality data are collected routinely and that data are used by health workers and managers to continuously monitor and improve the programme", and that "there is also a need for mentoring and supportive supervisory systems that can help facilities use data effectively on a regular basis". A comprehensive evaluation of the PMTCT programme (entitled "Evaluation of the Effectiveness of the National Prevention of Mother-to-Child Transmission (PMTCT) Programme Measured at Six Weeks Postpartum in South Africa, 2010") was published in 2012.⁹⁶ This was a large cross-sectional survey, involving 10 820 infants at 572 public sector facilities. Preliminary data from the 2011 follow-up survey, in 10 106 infants from 580 facilities, were released in mid-2012.⁹⁷ It was this set of data which pointed to a 2.67% (95% CI: 2.13-3.21) MTCT rate, and to predictions that the 2015 target of <2% perinatal HIV transmission at 6 weeks was within reach. Other insights have been gained from assessments within particular NGO programmes,⁹⁸ within a particular province,⁹⁹ in cross-country comparisons,¹⁰⁰ and in relation to breastfeeding practices.¹⁰¹ The impact of more effective prevention has been documented in terms of HIV prevalence and mortality among paediatric hospital admissions at Chris Hani Baragwanath Hospital.¹⁰²

Two other important HIV-related surveys have been completed or are in progress. Results from the Third South African National Communication Survey were released in 2012.¹⁰³ This was a nationally-representative cross-sectional survey conducted with 10 034 respondents to determine exposure to HIV communication programmes, as well as HIV knowledge, attitudes, self-efficacy and behaviour. One of the key findings was that condom use at first sex was now a 'social norm' among South Africans aged 16-55 years, with reported use increasing from 18% to 66%, over a 20 year period. The reach of testing and counselling efforts was also confirmed, with 64% reporting having ever tested. Knowledge and uptake of male medical circumcision was also increased. Overall, 83% of respondents had been reached by at least one of 19 communications interventions in the year prior to the survey. While no data have yet been reported, the fieldwork for the fourth South African National HIV, Behaviour and Health Survey 2012 has been completed.¹⁰⁴

The last decade has seen considerable progress in ensuring access to ART across sub-Saharan Africa.¹⁰⁵ UNAIDS and MSF issued a joint report on global treatment scale-up in mid-2012, highlighting the strategies, tools and policies that have been effective.¹⁰⁶ By mid-2011, South Africa had exceeded the treatment target set by the 2007-2011 National Strategic Plan, with an estimated 1.79 million (95% CI: 1.65-1.93 million) on treatment.¹⁰⁷ At that stage, the proportion of adults in need accessing treatment was estimated to be 79% (95% CI: 70-85%), based on the eligibility criterion of CD4<200/ μ l, but only 52% (95% CI: 46-57%) when using the updated criterion (CD4<350/ μ l). However, it was noted that access by men and children was lagging that by women. Using data from PEPFAR implementers, a description of paediatric access showed an increase from 2 412 children on treatment in September 2005 to 79 416 children in September 2010.¹⁰⁸

Estimates of the impact of HIV-related interventions can be made using mathematical modelling.¹⁰⁹ Some local examples have looked at the impact of condom usage and ART on incidence,¹¹⁰ and the effect of early ART on paediatric mortality.¹¹¹ Contributing factors to MTCT have also been explored in this way.¹¹² At an African level, the impact of ART on the age composition of the epidemic has also been modelled.¹¹³ Each of these modelling exercises can provide important guidance to policy and practice. Data from the Hlabisa demographic surveillance site (DSS) have shown a dramatic increase in adult life expectancy, from 49.2 years in 2003 to 60.5 years in 2011.⁵⁵ This study also calculated the cost-benefit ratio from ART implementation, and reported that the per capita gains were "2-6 times larger than the per capita cost of providing lifelong ART to every person who contracts HIV in this community". Perhaps most tantalisingly, data from the same site showed that when more than 30% of HIV-infected persons in an area were receiving ART, those who were uninfected in that area had a 38% lower risk of acquiring HIV than those living in an area with low (10% or less) ART coverage.¹¹⁴ These data have been hailed as important real-world confirmation of the promise of treatment as prevention (TasP), although they would need confirmation in prospective studies (such as cluster-randomised controlled trials).

Globally, the annual report from UNAIDS is eagerly awaited each year.¹¹⁵ The 2012 edition provided a ranking of countries in terms of the degree to which HIV incidence rates in adults aged 15-49 years had changed between 2001 and 2011. Nine countries showed increases exceeding 25%, 12 were rated as 'stable', 14 (including South Africa) had achieved decreases of 26-49%, but 25 had achieved decreases of 50% or more. Areas in which incidence was increasing were in the Middle East, North Africa, Eastern Europe and Central Asia. Notably, South Africa was one of six countries (including Burundi, Kenya, Namibia, Togo and Zambia), in which the number of newly infected children had declined by 40-59% from 2009 to 2011. In terms of prevalence, the global estimate was that 34.0 million [31.4 million-35.9 million] people were living with HIV at the end of 2011, of which 69% were in sub-Saharan Africa.

Table 11: HIV and AIDS indicators by province

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
AIDS orphans (maternal orphans <18 years)											
2009 ASSA2008	154 204	78 836	224 215	364 280	86 239	117 962	9 871	97 351	38 611	1 122 086	a
2010 ASSA2008	163 805	83 937	243 216	383 803	89 427	125 987	10 794	103 449	41 541	1 202 727	a
2011 ASSA2008	171 190	87 341	257 667	397 715	93 590	131 613	11 758	107 775	45 005	1 264 771	a
2012 ASSA2008	176 955	89 353	268 550	407 190	98 219	135 452	12 729	110 540	48 708	1 313 260	a
2013 ASSA2008	181 485	90 299	276 490	413 145	102 965	138 031	13 673	112 088	52 397	1 351 144	a
AIDS sick (number of people with AIDS-defining conditions)											
2009 ASSA2008	58 175	38 790	123 228	143 241	24 712	47 490	5 131	45 740	17 262	492 425	a
2010 ASSA2008	57 821	36 085	122 551	143 549	28 508	44 720	6 044	44 222	21 119	495 374	a
2011 ASSA2008	60 525	35 390	126 240	149 621	32 285	44 827	6 868	44 230	24 533	519 214	a
2012 ASSA2008	64 849	36 010	132 375	158 413	36 035	46 712	7 617	45 384	27 595	553 253	a
2013 ASSA2008	69 948	37 490	139 348	168 173	39 672	49 513	8 293	47 342	30 323	591 116	a
Antenatal client HIV 1st test positive rate (%)											
2009 DHIS	21.3	25.6	26.0	29.2	19.7	29.9	12.6	25.0	14.0	24.2	b
2010 DHIS	19.4	23.9	24.9	27.2	17.0	30.6	11.8	23.6	12.5	22.6	b
2011 DHIS	17.4	21.7	22.5	24.5	15.8	28.9	10.1	21.4	10.6	20.6	b
Antiretroviral coverage											
2009 total	-	-	-	-	-	-	-	-	-	37.0	c
2010 total	-	-	-	-	-	-	-	-	-	55.0	d
2011 adults	-	-	-	-	-	-	-	-	-	52.0	e
Early infant diagnosis coverage											
2009 NHLS	-	-	-	-	-	-	-	-	-	51.8	f
2009 NHLS in DHB	34.6	36.3	51.6	35.6	35.6	41.5	45.3	44.6	65.5	41.8	g
2010 NHLS	-	-	-	-	-	-	-	-	-	59.8	f
2010 NHLS in DHB	41.6	54.4	64.8	54.1	45.1	51.4	61.2	60.6	74.5	55.2	g
2011 NHLS	-	-	-	-	-	-	-	-	-	70.4	f
2011 NHLS in DHB	55.5	69.9	68.9	64.6	50.0	56.1	67.7	70.0	79.1	63.3	g
HIV incidence (%)											
2009 total population	0.9	0.8	0.6	1.0	0.6	0.9	0.4	0.8	0.3	0.8	a
2010 total population	0.8	0.8	0.6	1.0	0.5	0.9	0.4	0.8	0.3	0.7	a
2011 total population	0.8	0.8	0.6	1.0	0.5	0.9	0.4	0.8	0.3	0.7	a
2012 total population	0.8	0.7	0.5	1.0	0.5	0.9	0.4	0.8	0.3	0.7	a
2013 total population	0.8	0.7	0.5	1.0	0.5	0.8	0.4	0.8	0.3	0.7	a
HIV prevalence (%) (age 15-49)											
2009 ASSA2008	16.7	18.6	17.0	23.3	11.0	19.6	10.2	19.0	7.8	16.9	a
2009 Spectrum/EPP	-	-	-	-	-	-	-	-	-	17.2	h
2010 ASSA2008	16.8	18.6	17.0	23.1	11.1	19.6	10.3	18.9	7.9	17.0	a
2010 Spectrum/EPP	-	-	-	-	-	-	-	-	-	17.9	h
2011 ASSA2008	16.9	18.5	16.9	23.0	11.2	19.6	10.4	18.8	8.0	17.0	a
2011 Spectrum/EPP	-	-	-	-	-	-	-	-	-	17.3	h
2011 StatsSA	-	-	-	-	-	-	-	-	-	16.6	i
2012 ASSA2008	17.0	18.5	16.8	22.9	11.3	19.5	10.4	18.8	8.0	17.0	a
2013 ASSA2008	17.1	18.4	16.7	22.8	11.4	19.5	10.4	18.7	8.0	17.0	a
HIV prevalence (%) (antenatal)											
2009	28.1	30.1	29.8	39.5	21.4	34.7	17.2	30.0	16.9	29.4	j
2009 age <20	-	-	-	-	-	-	-	-	-	13.7	j
2009 age 15-24	-	-	-	-	-	-	-	-	-	21.7	j
2009 age 20-24	-	-	-	-	-	-	-	-	-	25.6	j
2010	29.9	30.6	30.4	39.5	21.9	35.1	18.4	29.6	18.5	30.2	k
2010 age 10-14	-	-	-	-	-	-	-	-	-	9.1	k
2010 age 15-19	-	-	-	-	-	-	-	-	-	14.0	k
2010 age 15-24	-	-	-	-	-	-	-	-	-	21.8	k
2010 age 20-24	-	-	-	-	-	-	-	-	-	26.7	k
2011	29.3	32.5	28.7	37.4	22.1	36.7	17.0	30.2	18.2	29.5	l
2011 age 10-14	0.0	10.0	11.1	12.5	7.1	12.5	0.0	20.0	6.7	-	l
2011 age 15-19	11.2	17.0	12.0	16.8	7.4	14.0	8.1	13.4	7.4	12.7	l
2011 age 15-24	20.7	23.0	18.7	25.5	13.6	25.0	12.8	21.3	11.7	20.5	l
2011 age 25-29	35.7	38.1	33.5	50.0	27.4	48.9	21.6	34.8	23.0	36.3	l
2011 age 30-34	45.7	48.3	42.2	53.1	33.5	53.8	22.3	40.7	24.9	42.2	l
2011 age 35-39	36.0	45.6	38.4	53.1	33.7	52.6	16.5	39.6	23.5	39.5	l

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
2011 age 40-44	37.9	37.8	26.8	43.2	22.9	34.0	20.0	42.6	16.7	31.7	l
2011 age 45-49	27.3	0.0	33.3	52.9	15.8	24.0	25.0	40.0	0.0	30.4	l
HIV prevalence (%) (total population)											
2009 ASSA2008	10.1	12.0	11.3	14.7	6.6	12.3	6.5	12.4	4.9	10.7	a
2009 StatsSA	-	-	-	-	-	-	-	-	-	10.4	i
2010 ASSA2008	10.3	12.0	11.3	14.8	6.8	12.4	6.6	12.4	5.0	10.9	a
2010 StatsSA	-	-	-	-	-	-	-	-	-	10.5	i
2011 ASSA2008	10.6	12.0	11.2	14.9	7.0	12.5	6.7	12.4	5.1	11.0	a
2011 StatsSA	-	-	-	-	-	-	-	-	-	10.6	i
2012 ASSA2008	10.8	12.1	11.2	15.1	7.1	12.7	6.8	12.5	5.2	11.1	a
2013 ASSA2008	11.0	12.1	11.2	15.2	7.3	12.8	6.9	12.5	5.2	11.2	a
2013 ASSA2008 female	13.1	13.8	12.6	17.3	9.6	15.7	8.4	13.9	6.5	13.0	a
2013 ASSA2008 male	8.6	10.4	9.8	12.9	4.6	9.6	5.3	11.1	3.9	9.3	a
Mother-to-child transmission rate of HIV <2 months of age											
2009 NHLS	-	-	-	-	-	-	-	-	-	6.2	f
2009 NHLS in DHB	5.4	5.7	5.2	6.1	7.0	6.5	6.0	5.5	4.2	5.7	m
2010 NHLS	-	-	-	-	-	-	-	-	-	4.4	f
2010 NHLS in DHB	4.0	4.1	3.3	3.8	4.5	3.8	3.5	3.5	3.1	3.7	m
2010 PMTCT survey	4.7	5.9	2.5	2.9	3.6	5.7	1.4	4.4	3.9	3.5	n
2011 NHLS	-	-	-	-	-	-	-	-	-	2.8	f
2011 NHLS in DHB	2.9	2.5	2.4	2.5	3.2	3.0	2.9	2.6	2.0	2.6	m
2011 PMTCT survey	3.8	3.8	2.1	2.1	3.1	3.3	6.1	2.6	2.0	2.7	o
Number of patients receiving ART											
2009 Children (<15)	-	-	-	-	-	-	-	-	-	76 000	p
2009 Men	-	-	-	-	-	-	-	-	-	283 000	p
2009 NGO programmes	-	-	-	-	-	-	-	-	-	47 000	q
2009 Private sector	-	-	-	-	-	-	-	-	-	117 000	q
2009 Public sector	-	-	-	-	-	-	-	-	-	748 000	q
2009 Women	-	-	-	-	-	-	-	-	-	553 000	p
2010 Children (<15)	-	-	-	-	-	-	-	-	-	113 000	p
2010 Men	-	-	-	-	-	-	-	-	-	396 000	p
2010 NGO programmes	-	-	-	-	-	-	-	-	-	60 000	q
2010 Private sector	-	-	-	-	-	-	-	-	-	154 000	q
2010 Public sector	-	-	-	-	-	-	-	-	-	1 073 000	q
2010 Women	-	-	-	-	-	-	-	-	-	777 000	p
2011 Children (<15)	-	-	-	-	-	-	-	-	-	152 000	p
2011 Men	-	-	-	-	-	-	-	-	-	551 000	p
2011 NGO programmes	-	-	-	-	-	-	-	-	-	78 000	q
2011 Private sector	-	-	-	-	-	-	-	-	-	190 000	q
2011 Public sector	-	-	-	-	-	-	-	-	-	1 525 000	q
2011 Women	-	-	-	-	-	-	-	-	-	1 090 000	p
2012 Adults (men)	63 105	31 384	129 768	160 904	39 776	34 440	6 576	43 431	41 108	550 492	r
2012 Adults (women)	107 448	68 564	238 663	331 223	96 403	61 035	13 152	77 020	67 071	1 060 579	r
2012 Children	10 824	9 732	22 785	43 783	11 547	5 435	3 758	9 847	6 908	124 619	r
People living with HIV											
2009 ASSA2008	676 159	346 974	1 196 652	1 526 404	377 781	464 361	72 594	422 850	257 437	5 350 803	a
2009 Spectrum/EPP	-	-	-	-	-	-	-	-	-	5 400 000	h
2010 ASSA2008	695 707	348 832	1 207 378	1 550 955	394 221	472 882	74 963	427 023	266 180	5 467 182	a
2010 Spectrum/EPP	-	-	-	-	-	-	-	-	-	5 500 000	h
2011 ASSA2008	715 736	351 746	1 215 856	1 576 025	409 161	482 288	76 966	431 576	273 114	5 577 812	a
2011 Spectrum/EPP	-	-	-	-	-	-	-	-	-	5 600 000	h
2012 ASSA2008	736 404	355 466	1 222 605	1 602 236	423 400	492 287	78 711	436 670	278 889	5 685 424	a
2013 ASSA2008	756 979	359 406	1 227 020	1 628 536	436 918	502 186	80 225	441 816	283 550	5 786 603	a
Percentage of deaths due to AIDS											
2009 ASSA2008	27.9	38.2	38.5	39.5	21.1	42.0	16.3	41.0	11.9	32.9	a
2009 StatsSA	-	-	-	-	-	-	-	-	-	46.4	i
2010 ASSA2008	26.5	35.0	36.8	38.0	22.5	38.8	18.0	38.7	13.7	31.7	a
2010 StatsSA	-	-	-	-	-	-	-	-	-	44.3	i
2011 ASSA2008	26.1	33.0	35.9	37.6	23.7	37.1	19.2	37.2	14.9	31.3	a
2011 StatsSA	-	-	-	-	-	-	-	-	-	43.6	i
2012 ASSA2008	26.3	32.1	35.6	37.7	24.7	36.5	20.1	36.5	15.9	31.5	a
2013 ASSA2008	27.0	31.8	35.5	38.1	25.6	36.6	20.9	36.2	16.7	31.9	a

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Proportion of ANC clients tested for HIV											
2009 DHIS	100.9	94.9	85.3	97.8	86.5	99.4	104.7	113.7	87.9	93.7	b
2010 DHIS	95.9	97.9	98.8	98.3	113.3	108.1	71.2	111.2	91.8	99.9	b
2011 DHIS	94.3	97.4	85.1	114.2	101.6	110.9	74.7	106.2	91.3	98.0	b

Reference notes (indicator definitions from page 310 and references from page 315):

- a ASSA2008.⁶²
- b DHIS. Data extracted June 2012. Data for financial year from April of the year to March of the following year (not calendar year).
- c Universal Access 2010.¹¹⁶ Based on WHO 2010 guidelines for ART.
- d Universal Access 2011.¹¹⁷ Range: 52-58%. Based on 1 389 865 people receiving antiretroviral therapy.
- e Johnson 2012.¹⁰⁷ Based on CD4 threshold of 350.
- f Barron et al. 2013.⁹⁵
- g DHB 2011/12.⁵⁴ 2009/10, 2010/11 and 2011/12 financial years. Numerator: NHLS PCR tests under 2 months of age. Denominator: Live births in facility from DHIS x antenatal HIV prevalence from antenatal surveys to estimate HIV-exposed infants.
- h Antenatal Survey 2011.⁷² Modelled from antenatal HIV survey using the Epidemic Projection Package.
- i StatsSA Mid-year estimates.³⁴ 2011 mid-year estimates used in calculation of population projections.
- j Antenatal Survey 2009.¹¹⁸
- k Antenatal Survey 2010.⁷⁷
- l Antenatal Survey 2011.⁷² National value for prevalence in the 10-14 age group was not provided in source.
- m DHB 2011/12.⁵⁴ 2009/10, 2010/11 and 2011/12 financial years.
- n PMTCT Survey 2010.⁹⁶
- o PMTCT Survey 2011 prelim.⁹⁷
- p Johnson 2012.¹⁰⁷ Totals reflect ART enrolment over the 12 months up to the middle of the year. Includes public and private sector estimates.
- q Johnson 2012.¹⁰⁷ Totals reflect ART enrolment over the 12 months up to the middle of the year.
- r AHS 2012.⁶⁷ End of financial year 2011/12. CCMT statistics provided for the Annual Health Statistics Publication.

Reproductive health

Contraception, sexual behaviour, sexually transmitted infections and termination of pregnancy

Context	In a country with a generalised HIV and AIDS epidemic, measures of sexual behaviour and contraceptive practice are important, as they can provide some indication of the impact of HIV prevention efforts. Changes in contraceptive practice are also linked with changes in fertility and women's reproductive choices.
New data sources	Nationally, new data have been reported in the: <ul style="list-style-type: none"> • Third South African National Communications Survey 2012 • National Income Dynamics Study (NiDS) Wave 1 and Wave 2 • District Health Information System (DHIS) Internationally, reports of interest include: <ul style="list-style-type: none"> • Save the Children Fund. Every Women's Right, 2012 • Guttmacher Institute and United Nations Population Fund (UNFPA). Adding It Up: Costs and Benefits of Contraceptive Services—Estimates for 2012
Key issues and trends	Although the National Communication Survey has confirmed the high levels of exposure to HIV communications that were shown in 2009, there are still areas of reproductive health practice that need careful attention. Access to quality reproductive health services is important not only for women's health, but also for the health of their children. As before, data on terminations of pregnancy are inadequate to allow for any effective monitoring of access to this essential service.

The Third National HIV Communication Survey (NCS) was conducted in early 2012, with key findings being made available in July 2012.¹⁰³ Responses were obtained from 10 034 respondents in all nine provinces, with the sampling designed to be representative of 16-55 year-olds across all race groups. Responses were stratified by levels of exposure to HIV communication programmes. Although the overall the level of exposure to at least one communication survey in the last 12 months had decreased from 90% in 2009 to 83% in 2012, there was evidence of substantial increases in behaviours that reduce the risk of HIV. These included condom use, undergoing HIV counselling and testing and voluntary medical male circumcision. The data also are said to confirm that exposure to HIV communication programs had a direct impact on people practising these behaviours and that exposure to campaigns for medical male circumcision had increased demand for these services. Condom use at first sex was associated with a lower risk of being HIV positive in the future and also with using condoms with one's most recent partner. Condom use at last sex was stratified by partner type and showed marked differences, with a greater percentage of individuals using a condom with a casual partner than those who had a live-in partner or spouse. A large household survey on condom usage conducted in the Free State, in which responses were elicited from 5 837 adults, was also reported in 2012.¹¹⁹ This study provided useful insights into the potential reasons for refusing to use a condom. Interestingly, given their access to counselling as well as to healthcare services, a high rate of unintended pregnancy was demonstrated in a cohort of ART patients.¹²⁰ Of 170 pregnancies in a cohort of 850 women, 62% were unplanned, indicating a clear need to better integrate reproductive health and HIV care systems.

Increased condom use appears to be the most significant explanatory factor for the decline in HIV incidence in South Africa between 2000 and 2008 – a 27% decline using the STI-HIV model and a 31% decline using the ASSA2003 model.¹¹⁰ Beksinska et al. discussed progress and challenges in relation to male and female condom use in South Africa.¹²¹ They noted several challenges to promoting effective and consistent condom use, including the failure to promote condoms as a barrier method for pregnancy

and HIV/STI prevention. The latter issue is highlighted by a study reporting that a high prevalence of asymptomatic urethritis/cervicitis pathogens exists amongst HIV-infected individuals offered voluntary STI screening and also that sub-optimal condom use with a regular partner is a risk factor for asymptomatic trichomonas vaginalis infection.¹²²

A second Young Africa Live (YAL) Sex Survey was conducted by the Prækelt Foundation, covering the period from May 2011 to May 2012.¹²³ Although the representivity of the survey may be questioned, it does report on over 170 000 responses by YAL's user community to more than 50 questions about the views and behavioural characteristics of the youth. Condom use was reported on by 7 775 individuals of whom 54% reported using condoms every time (and thus at the last sex act), 23% reported inconsistent condom use, and 23% reported never using condoms. Of the 8 132 respondents who answered a question about when they had first had sex, 15% had done so by their 16th birthday, 27% between 16 and 18 years, 21% between 18 and 21 years and 10% over the age of 21 whilst 25% were still virgins. Of the 1 736 sexually active young women who answered the question "Have you had to deal with the consequences of teenage pregnancy?" in the affirmative, 64% had been pregnant (made up of 50% who had delivered and 14% who had opted for a termination) whilst 36% were using some form of family planning. Of the 4 402 young men who answered the question whether they would choose a hospital or traditional circumcision, the majority (51%) chose "Hospital – I don't want to risk my health", whilst 33% opted for "traditional as it's part of culture", and only 16% said they did not believe in getting circumcised. This finding is in contrast to a study from Cape Town amongst 199 predominantly Xhosa men who were older (median age 28; interquartile range: 22-35).¹²⁴ The majority (n=147) reported having undergone traditional circumcision and an unwillingness to undergo further medical circumcision if the foreskin was only partially removed (n=127, 80%). Of the 50 men who were not yet circumcised but were planning on being circumcised, 75% reported that a medical circumcision would be against their religion.

The total number of condoms distributed nationally in 2011/12 was 392 million, although only 272 million were recorded in DHIS. On average, 15.8 male condoms were distributed per male 15 years and older in 2011/12. This rate has been steadily increasing, with a more than three-fold improvement from a base of 4.6 in 2000/01.⁵⁴

Findings from a study amongst 245 women in KwaZulu-Natal at high risk of acquiring HIV suggest that that gender inequality and access to formal education, as opposed to lack of HIV/AIDS knowledge, prevent safer sexual practices. Participants demonstrated a high level of HIV/AIDS knowledge. Overall, 60.3% of participants reported condom use. Reported condom use at last sexual encounter varied slightly by partner type (57.0% with steady versus 64.4% with casual partners), and self-perceived ability to choose to use a condom was significantly lower with steady partners compared to casual partners ($p < 0.01$).¹²⁵

Attention to HIV risk should not obscure the importance of contraception options for women's reproductive health, as well as the health of their children.¹²⁶ Put simply, "[t]here are strong links between the provision of family planning and improvements in child health and survival". In 2012, the Guttmacher Institute and United Nations Population Fund (UNFPA) provided updated estimates of the numbers and proportions of women in the developing world using and in need of modern contraception methods.¹²⁷ Adolescent sexual and reproductive health is often neglected, and needs to be addressed by the new Integrated School Health Programme. Data from the National Income Dynamics Study (NiDS) Wave 1 has shown that the greatest risk of teenage pregnancy is among those who have never entered secondary school.⁴² However, the greatest number of births to teenage mothers was recorded in those with an incomplete secondary school education. Karra and Lee have summarised the available data from two recent studies on teenage pregnancy – the Cape Area Panel Study and the Africa Centre Study.¹²⁸ Both studies showed teenage mothers to be at risk of worse educational outcomes, and also documented adverse effects on maternal and child health.

One of the options open to a woman with an unplanned pregnancy in South Africa is a safe and legal abortion. Orner et al. have explored the available evidence on barriers to accessing such services, particularly for women living with HIV, contrasting the situation in Brazil, Namibia and South Africa.¹²⁹ Despite the existence of an enabling policy and legislative framework, the authors pointed out that "many South African women continue to face numerous obstacles to safe abortions", and that "changing laws is not enough". One way to maintain pressure would be to insist on accurate and up-to-date reporting of the provision of such services. The large number of terminations of pregnancy recorded annually in DHIS (77 780 in 2011/12) suggests a significant unmet need for contraception. Globally, the abortion rate was stable between 2003 and 2008, but lower in countries with more liberal abortion laws.¹³⁰ Worryingly, it appears that the proportion of abortions that are unsafe has increased over time. A rare insight into local public sector services was provided by a prospective audit conducted at a district health facility in KwaZulu-Natal between February and September 2009.¹³¹ Of the 645 women enrolled in the study, 34.4% had previously used a family planning method, with the most common (35.1%) being an injectable hormonal contraceptive. Notably, none of the women was offered an HIV test or given any information about sexually transmitted infections prior to discharge.

Table 12: Contraception and sexual behaviour indicators by province

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Age of first sex under 14 years (% having first had sex at age 14 or younger)											
2009 female age 16-19	-	-	-	-	-	-	-	-	-	4.0	a
2009 female age 16-24	-	-	-	-	-	-	-	-	-	5.0	a
2009 male age 16-19	-	-	-	-	-	-	-	-	-	8.0	a
2009 male age 16-24	-	-	-	-	-	-	-	-	-	14.0	a
Condom use at last sex (%)											
2009	-	61	-	-	-	-	-	-	-	-	b
2009 age 16-55	34	36	45	40	40	46	23	46	27	40	a
2012 overall	-	-	-	-	-	-	-	-	-	60	c
2012 with a casual partner	-	-	-	-	-	-	-	-	-	76	d
2012 with a main/regular partner	-	-	-	-	-	-	-	-	-	65	d
2012 with spouse	-	-	-	-	-	-	-	-	-	28	d
Couple year protection rate											
2009 DHIS	29.7	32.0	27.1	24.2	35.4	31.6	33.6	26.0	59.4	31.9	e
2010 DHIS	30.4	32.4	26.3	24.2	32.7	33.0	36.0	26.3	58.8	31.6	e
2011 DHIS	31.2	34.7	26.2	27.1	36.5	33.7	35.1	23.6	58.3	32.7	e
Ever had sex (%)											
2009 age 16-24	-	-	-	-	-	-	-	-	-	70	a
2009 female age 16	-	-	-	-	-	-	-	-	-	31	a
2009 male age 16	-	-	-	-	-	-	-	-	-	17	a
HIV knowledge, people who know that a person can protect him / herself from HIV infection by condom											
2009 age 16-55	96.0	90.0	93.0	91.0	95.0	96.0	93.0	84.0	94.0	93.0	a
Male circumcision (% of men who are circumcised)											
2009 NCS 2009	73.0	34.0	46.0	18.0	77.0	36.0	17.0	33.0	42.0	42.0	f
2012 NCS 2012	-	-	-	-	-	-	-	-	-	48.1	g
Male condom distribution rate											
2009 DHIS	12.1	8.6	8.2	8.2	14.6	16.3	6.7	7.2	38.6	13.3	e
2010 DHIS	14.5	9.9	8.3	8.2	13.6	20.2	9.5	8.3	45.8	14.8	e
2011 DHIS	14.8	12.2	7.9	11.1	19.7	19.4	8.3	6.0	45.7	15.8	e
Male condoms distributed (thousands)											
2009	-	-	-	-	-	-	-	-	-	445 156	h
2010	69 186	29 853	87 075	72 020	52 116	51 289	15 002	44 492	71 165	492 198	i
2011	36 939	25 050	77 150	74 262	44 934	44 322	8 192	29 814	51 260	391 923	j

Reference notes (indicator definitions from page 310 and references from page 315):

- a NCS 2009.¹³² Downloaded 2011-05-26.
- b Chandran et al. 2012.¹¹⁹ The sample (n = 5 837) consisted of 76% urban and 24% rural residents. There were 57% women and 91% Africans compared to 52% and 87% respectively in the population of the Free State province. Most study participants were young (57% in the age group 18 to 29 years; 27% between 30-39 years, 12% between 40 to 49 years, and 4% were above 50 years). Almost 34% of the participants were married or living together. Most participants were unemployed or students. Seven per cent of the participants had completed higher education.
- c NCS 2012.¹⁰³ Estimated. 41.3% for those with least exposure to communication programmes and 63% for those with most exposure.
- d NCS 2012.¹⁰³
- e DHIS. Data extracted June 2012. Data for financial year from April of the year to March of the following year (not calendar year).
- f NCS 2009.¹³² Downloaded 2011-05-26. Survey sampled men aged 16-55.
- g NCS 2012.¹⁰³ Survey sampled men aged 16-55. Among the 5 471 890 men who said they were not circumcised: Almost a million said they definitely intended to get circumcised in the next 12 months. Of those that say they will definitely get circumcised, 80.5% (803 690) intend to have a medical circumcision.
- h DoH Annual Report 2009/10.¹³³
- i AHS 2012.⁶⁷ Data for financial year from April of the year to March of the following year (not calendar year). Target 1 billion. Funding for the procurement of an additional 500 million condoms to meet the demand generated by the HCT campaign was received late in December 2010 (DoH Annual Report 2010/11).
- j AHS 2012.⁶⁷ Data for financial year from April of the year to March of the following year (not calendar year). Delays in awarding the national tender for male condoms due to legal action initiated against National Treasury - Delays in the registration of approved service providers by provinces - Many service providers were unable to meet service demands (DoH Annual Report 2011/12).

Table 13: STI indicators by province

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
STI partner treatment rate (%)											
2009 DHIS	22.4	22.9	20.7	18.5	20.7	26.3	19.2	25.9	26.1	21.3	a
2010 DHIS	23.3	22.4	21.5	20.8	22.8	25.5	22.2	26.8	29.5	22.6	a
2011 DHIS	24.3	22.6	22.4	20.7	22.1	33.4	23.8	24.7	31.2	23.3	a
STI treated new episode incidence											
2009 DHIS	4.6	3.3	3.5	6.7	4.7	4.1	2.8	3.5	1.9	4.3	a
2010 DHIS	4.4	3.1	3.4	6.5	3.8	3.6	2.3	3.0	1.7	3.9	a
2011 DHIS	4.4	2.9	3.4	6.6	3.5	3.5	2.4	2.5	1.6	3.9	a

Reference notes (indicator definitions from page 310 and references from page 315):

- a DHIS. Data extracted June 2012. Data for financial year from April of the year to March of the following year (not calendar year).

Table 14: Termination of pregnancy indicators by province

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
ToP facilities functioning (%)											
2009 CHCs	-	-	-	-	-	-	-	-	-	25.0	a
2010 CHCs	-	-	-	-	-	-	-	-	-	46.0	b
2011	-	-	-	-	-	-	-	-	-	57.0	c
ToP rate (%)											
2009 DHIS	5.3	8.0	9.9	1.9	5.7	2.6	3.4	6.7	10.6	5.9	d
2010 DHIS	4.9	7.4	8.5	1.8	5.9	2.7	4.4	7.5	9.4	5.6	d
2011 DHIS	7.2	7.8	8.3	2.3	6.3	3.3	4.1	8.3	8.8	6.1	d
ToPs (Terminations of Pregnancy)											
2009 DHIS	10 530	6 262	23 521	5 540	8 630	2 456	975	5 959	13 274	77 147	e
2010 DHIS	8 980	5 595	20 955	5 040	8 342	2 680	1 241	6 444	12 271	71 548	e
2011 DHIS	12 397	5 648	21 318	6 560	8 555	3 340	1 144	6 890	11 928	77 780	e

Reference notes (indicator definitions from page 310 and references from page 315):

- a DoH Annual Report 2009/10.¹³³ The main challenge was the high turnover rate among nurses trained to provide first trimester termination of pregnancy.
- b DoH Annual Report 2010/11.¹³⁴ Target 40%. Designation of ToP facilities is now a provincial responsibility, and consequently there has been a decrease in the designation of facilities, resulting in a higher proportion functioning.
- c DoH Annual Report 2011/12.¹³⁵ 2011/12 financial year. Additional facilities were designated to provide CToP services during the reporting period.
- d DHIS. ToPs as % of all expected pregnancies in catchment population. Data extracted June 2012. Data for financial year from April of the year to March of the following year (not calendar year).
- e DHIS. Data extracted June 2012. Data for financial year from April of the year to March of the following year (not calendar year).

Maternal health

Context	South Africa has committed to the African Union's Campaign for Accelerated Reduction of Maternal and Child Mortality (CARMMA). At the national level, this is evident in the Strategic Plan for Maternal, Newborn, Child and Women's Health (MNCWH) and Nutrition in South Africa 2012-2016.
New data sources	Nationally, new data have been reported in the: <ul style="list-style-type: none"> • Saving Mothers 2008-10 • Ninth Interim Report on the Confidential Enquiries into Maternal Deaths in South Africa 2011 • District Health Information System (DHIS) Internationally, reports of interest include: <ul style="list-style-type: none"> • WHO. Trends in maternal mortality: 1990 to 2010
Key issues and trends	<ul style="list-style-type: none"> ➢ There is evidence from the most recent report of the National Committee for Confidential Enquiries into Maternal Deaths (NCCEMD) that institutional MMRs (iMMR) had decreased in 2011, compared with 2008-2010. This has been attributed to increasing access to ART in pregnant women. ➢ Establishment of District Clinical Specialist teams as part of PHC re-engineering is one initiative that is intended to strengthen maternal and child health services.

The targets set for the Strategic Plan for Maternal, Newborn, Child and Women's Health (MNCWH) and Nutrition in South Africa 2012-2016 are those agreed to by the Health Data Advisory and Coordination Committee (HDACC) in 2011:

- reducing the Maternal Mortality Ratio from a baseline of 310 per 100 000 live births (2009) to 270 (2014);
- reducing the Under 5 mortality rate from a baseline of 56 per 1 000 live births (2009) to 50 (2014) and 40 (2016);
- reducing the Infant Mortality Rate from a baseline of 40 per 1 000 live births (2009) to 36 (2014) and 32 (2016); and
- reducing the Neonatal Mortality Rate from a baseline of 14 per 1 000 live births (2009) to 12 (2014) and 11 (2016).¹³⁶

However, this strategy document also includes very detailed targets for individual interventions. For instance, increasing the percentage of children with diarrhoea who receive zinc from less than 5% to 95%. Other targets include working with pharmaceutical services to "decrease the % of PHC facilities which experience stock-outs of essential drugs" (for which no baseline data are provided, but a target of <5% of facilities is stipulated) and working with the National Blood Transfusion Service to "increase the % of hospitals where caesarean sections are performed that have blood available" (again with no baseline, but a target of 100%). The monitoring and evaluation framework noted that "[m]any of these indicators can only be collected through large-scale surveys which are conducted intermittently (often every three to five years)".

In addition to this overarching strategic document, a document entitled "South Africa's National Strategic Plan For A Campaign on Accelerated Reduction of Maternal And Child Mortality In Africa (CARMMA)" has also been produced, in support of the African Union's initiative.¹³⁷ This states that the "targets and indicators for CARMMA in South Africa are in line with the MDG4 (Reduce child mortality) and MDG5 (Improve maternal health), as harmonized with the Maputo Plan of Action for the Operationalization of the Continental Policy Framework". The document then lists an extensive set of 'key components', as follows:

- a) "Strengthen and promote access to comprehensive [sexual and reproductive health and rights] SRHR services, with specific focus on family planning services.

- b) Advocacy and health promotion for early antenatal care and attendance/ booking.
- c) Improve access to Skilled Birth Attendants by:
- Allocating dedicated obstetric ambulances to every sub-district to ensure prompt transfer of women in labour and women and children with obstetric and neonatal emergencies to the appropriate level of care.
 - Establishment of maternity waiting homes.
- d) Strengthening Human Resources for Maternal and Child Health by:
- Providing training on Essential Steps in Management of Obstetric Emergencies (ESMOE) to doctors and midwives.
 - Intensifying midwifery education and training.
- e) Improve child survival by:
- Promoting and supporting exclusive breastfeeding for at least 6 months.
 - Providing facilities for lactating mothers (boarder mothers) in health facilities where children are admitted.
 - Promotion of Kangaroo Mother Care (KMC) for stable low birth weight babies at all levels of care.
 - Advocacy for appropriate care and support for pregnant women and lactating mothers in the workplace.
 - Improving immunization and vitamin A coverage.
 - Intensifying management of severe malnutrition in health facilities.
 - Intensifying case management of sick children through:
 - improving implementation of key family practices including diarrhoea management at home
 - strengthening implementation of [the Integrated Management of Childhood Illnesses] IMCI in all primary health care facilities
 - strengthening clinical skills for the management of severe diseases including pneumonia and diarrhoea in referral facilities

f) Intensifying management of HIV positive mothers and children by:

- Improving access to treatment for both mothers and children
- Improving management of co-infections and
- Eliminating Mother-to-Child Transmission of HIV".

To this already daunting list must be added the re-engineering of Primary Health Care initiative, and the efforts to deploy district clinical specialist teams in 25 districts with poor maternal and child health outcomes. The potential data demands for such wide-ranging interventions are immense. A useful review of the evidence base for key interventions in this area was published by the Partnership for Maternal, Newborn & Child Health in 2011.¹³⁸

Nationally, the most recent report from the National Committee for Confidential Enquiries into Maternal Deaths (NCCEMD), the ninth interim report, covers deaths that occurred in 2011, as reported up to August 2012.¹³⁹ The report stated that the institutional Maternal Mortality Ratio (iMMR) had decreased in 2011, compared with that reported for the 2008-2010 period. The authors believed that this decrease "was virtually entirely limited to deaths due to non-pregnancy related infections, the vast majority of whom are HIV infected", and that this was early evidence of the effect of increasing access to ART in pregnant women.

One of many avoidable factors that may contribute to poor maternal outcomes is late booking for antenatal care. The District Health Barometer (DHB) reported that only 40.2% of first antenatal visits recorded in DHIS took place before 20 weeks gestation.⁵⁴ A study in North West province identified, through a process of community dialogues, a variety of reasons for booking late, including late disclosure of pregnancy by teenagers, fear of testing for HIV, and poor nurse attitudes.¹⁴⁰ Furthermore, cultural beliefs cited as barriers included wanting to wait until the first trimester has passed for fear of miscarriage, and beliefs that iron supplementation provided during pregnancy risked "making the tummy larger". Psychological reasons, including dealing with unplanned pregnancies and sexual assault, are also known to contribute to late booking. Additional reasons for a low antenatal 1st visit before 20 weeks are a lack of understanding and insufficient education on the importance of antenatal care, which may appear inconsequential to some. Furthermore, unsuitable hours for booking visits for school girls and working individuals, as well as transport issues, are considered to be important barriers.

Globally, WHO has reported on trends in maternal mortality for the period from 1990 to 2010.¹⁴¹ This also linked the increases seen in MMRs in southern African countries (specifically in Botswana, Lesotho, Namibia, South Africa and Swaziland) between 1990 and 2000 to HIV epidemic, and noted recent reversals of these trends. It was noted further that all of these countries had now met the 2001 UN General Assembly Special Session (UNGASS) goal of providing ARVs for PMTCT to 80% of pregnant women living with HIV.

Table 15: Maternal health indicators by province

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
ANC coverage (%)											
2009 DHIS	88.1	84.0	140.7	99.1	124.3	104.0	93.9	98.3	94.7	106.8	a
2010 DHIS	94.6	85.6	112.9	99.1	106.3	98.9	131.3	95.9	89.9	100.7	a
2011 DHIS	99.4	87.1	121.1	90.1	111.8	99.9	127.8	102.0	80.8	101.2	a
ANC visits per client											
2009 DHIS	3.0	4.3	3.2	3.8	2.9	3.4	4.5	3.7	4.7	3.5	a
2010 DHIS	3.0	4.2	3.6	4.0	3.4	3.5	3.5	3.9	4.5	3.7	a
2011 DHIS	3.1	4.3	3.7	4.6	3.6	3.5	3.7	3.5	4.6	3.8	a
Caesarean section rate (%)											
2009 Private hospitals	-	-	-	-	-	-	-	-	-	68.0	b
2009 DHIS	22.3	18.7	20.8	25.8	14.7	15.6	16.6	15.4	20.8	20.3	c
2010 DHIS	24.3	20.8	23.0	26.9	14.6	15.8	17.6	16.1	22.9	21.6	c
2011 DHIS	25.0	22.5	24.3	28.6	14.9	16.4	19.5	16.7	24.5	22.7	c
Delivery rate in facility (%)											
2009 DHIS	71.4	77.5	104.1	79.3	99.2	91.4	85.0	80.1	94.3	87.3	a
2010 DHIS	75.8	78.2	98.5	80.6	104.6	86.8	90.1	78.3	89.9	87.4	a
2011 DHIS	83.4	79.8	96.3	84.2	114.2	90.5	85.6	84.6	83.9	90.1	a
Maternal mortality ratio (MMR)											
2009 VR adjusted	-	-	-	-	-	-	-	-	-	333	d
2010 DHIS	148	237	94	197	142	161	91	205	-	139	e
2010 NCCEMD 2008-10	193	289	148	192	165	184	250	230	85	176	f
2010 WHO (2012 estimates)	-	-	-	-	-	-	-	-	-	300	g
2011 DHIS	115	199	123	192	185	135	148	190	29	145	e
2011 IHME (2011 estimates)	-	-	-	-	-	-	-	-	-	91	h
2011 NCCEMD	-	-	-	-	-	-	-	-	-	157	i
Number of maternal deaths											
2009 NCCEMD	263	171	319	378	196	115	53	161	110	1 766	j
2010 DHIS	172	112	185	365	172	113	19	111	-	1 249	e
2010 NCCEMD	232	120	293	385	198	150	52	134	82	1 646	j
2010 WHO (2012 estimates)	-	-	-	-	-	-	-	-	-	3 200	g
2011 DHIS	137	94	250	366	236	101	30	107	26	1 347	e
2011 IHME (2011 estimates)	-	-	-	-	-	-	-	-	-	961	h
2011 NCCEMD	-	-	-	-	-	-	-	-	-	1 466	i
PMDF (proportion maternal among deaths of females of reproductive age)											
2010 WHO (2012 estimates)	-	-	-	-	-	-	-	-	-	2.3	g

Reference notes (indicator definitions from page 310 and references from page 315):

- a DHIS. Data extracted June 2012. Data for financial year from April of the year to March of the following year (not calendar year).
- b NaPeMMCo 2008-2010.¹⁴² Year of data not specified. Presumed to be an average of several years' data around 2009. The three large hospital groups provided data from a total of 117 hospitals with delivery numbers for the individual hospitals ranging between around 4000 and less than 50 per year.
- c DHIS. All types of facilities. Data extracted June 2012. Data for financial year from April of the year to March of the following year (not calendar year).
- d RMS 2011.⁵⁹ The MMR is calculated (according to the method proposed by HDACC) from adjusted vital statistics by proportional redistribution of the ill-defined natural causes (ICD codes R00-R99) among the specified natural causes. Thereafter, the number is adjusted to allow for the fact that about 7% of deaths are not registered.
- e DHIS. Institutional (facility) MMR based only on maternal deaths in facilities. Data extracted June 2012. Data for financial year from April of the year to March of the following year (not calendar year). WC data not imported into DHIS for some years.
- f Saving Mothers 2010.¹⁴³ Average value for 2008-2010. Institutional (facility) MMR based only on maternal deaths in facilities, captured into the database for confidential enquiries into maternal deaths. Note that there are minor discrepancies between the provincial totals and sum of district values given in the publication. The calculated MMR may also vary from other sources depending on the number of live births used in the denominator.
- g Maternal Mortality 1990-2010.¹⁴¹
- h Lozano et al. 2011.¹⁴⁴
- i Saving Mothers report 2011,¹³⁹ as reported by the media.
- j Saving Mothers 2010.¹⁴³

Child health

Context	Decreasing maternal and child mortality is one of four key outputs articulated in the Negotiated Service Delivery Agreement (NSDA) 2010-2014. Both maternal and child health are also the focus of a number of the Millennium Development Goals. The level of attention paid to these topics is evident from the large number of international reports issued. Two national committees (NaPeMMCo and CoMMiC) have also reported on perinatal and under-five mortality.
New data sources	<p>Nationally, new data have been reported in the:</p> <ul style="list-style-type: none"> • South African Child Gauge 2012 • UNICEF South Africa Annual Report 2011 • National Perinatal Mortality and Morbidity Committee (NaPeMMCo) Triennial Report (2008-2010) and interim 2010-2011 report • 1st Triennial Report of the Committee on Morbidity and Mortality in Children Under 5 Years (CoMMiC) 2011 • StatsSA Levels and trends of morbidity and mortality among children aged under-five years in South Africa, 2006-2010 (2012) • MRC Under-5 Mortality Statistics In South Africa: Shedding some light on the trend and causes 1997-2007 (2012) • MRC Rapid Mortality Surveillance report 2011 • District Health Information System (DHIS) <p>Internationally, reports of interest include:</p> <ul style="list-style-type: none"> • UNICEF. The State of the World's Children 2012 • Save the Children. The Child Development Index 2012 • WHO. Born too soon: The Global Action Report on Preterm Birth 2012 • Countdown to 2015 – various reports • UNICEF. Committing to Child Survival: A Promise Renewed. 2012 • UN Inter-agency Group for Child Mortality Estimation updated estimates of child mortality (www.childmortality.org) • UNICEF/WHO. Immunization Summary: A statistical reference containing data through 2011
Key issues and trends	<ul style="list-style-type: none"> ➢ Targets have been set by both the Strategic Plan for Maternal, Newborn, Child and Women's Health (MNCWH) and Nutrition in South Africa 2012-2016 and the School Health Policy and Implementation Guidelines (June 2011) updated in 2012 as the Integrated School Health Policy. ➢ As noted in the section on mortality, significant progress has been noted in relation to the under-five mortality rate and the infant mortality rate, but not the neonatal mortality rate.

The targets set for the Strategic Plan for Maternal, Newborn, Child and Women's Health (MNCWH) and Nutrition in South Africa 2012-2016 have already been described.¹³⁶ The School Health Policy and Implementation Guidelines also proposed a set of indicators.^{145,146} These are:

- the number of schools implementing school health programmes;
- the number of primary schools visited to conduct learner assessments;
- the proportion of learners referred for visual impairment, hearing impairment, speech impairment and oral health;
- the number of Grade 1 learners screened at primary schools;
- the proportion of learners referred for Tetanus Toxoid (Td) among 6-year-old learners and among 12-year-old learners;
- the proportion of learners referred for mental health problem or other health condition, and for social support;
- the number of learners who received deworming medication; and
- the proportion of follow-ups made by school health nurses.

Each of these implies the collection of routine data by personnel involved in this service. Selected indicators from the Integrated School Health Programme (ISHP) are included in the 2013 National Indicator Data Set (NIDS).

Each year, the UNICEF State of the World's Children report presents a snapshot of the global situation.¹⁴⁷ The 2012 edition focused on the status of children in urban settings. Already more than 1 billion children live in such settings. While, traditionally indicators of child health have been expected to be better in urban rather than rural settings, these figures have disguised the plight of the urban poor. The report noted the paucity of what it termed intra-urban data: "Reliable statistics can help illuminate the plight of poor and marginalized children in urban settings – after all, it is difficult to argue with facts. However, this seemingly straightforward process is hampered by the limited availability of urban data that are meaningfully disaggregated – by wealth, residence, gender, ethnicity, city size or other relevant criteria".

Another aggregate set of data is presented in Save the Children's Child Development Index 2012.¹⁴⁸

Child mortality

As the definitions used in this area are overlapping and often confusing, they are depicted here for convenience (Figure 2). Two national committees have provided new reports in this area: the Committee on Morbidity and Mortality in Children Under 5 Years (CoMMiC)¹⁴⁹ and the National Perinatal Mortality and Morbidity Committee (NaPeMMCo).¹⁴²

Figure 2: Definitions of mortality in children

Stillbirths	Early neonatal deaths	Late neonatal deaths	Post-neonatal deaths	Child deaths
>28 weeks gestation	Birth < end of the 7th day	8th day < end of 27th day	28th day < end of 365th day	1st year < end of 4th year
Perinatal Mortality				
	Neonatal Mortality		Post-neonatal Mortality	
	Infant Mortality			Child Mortality
	Under-5 Mortality			

The CoMMiC report was the first from this national committee, covering the period from 2008 to 2011.¹⁴⁹ It was one of three national committees established to review maternal, perinatal and childhood deaths in South Africa. CoMMiC was tasked to “establish the magnitude of childhood deaths in the country, identify the direct and indirect causes of childhood mortality, offer recommendations to reduce childhood morbidity and mortality in South Africa, and assist in the development of implementation plans”. The committee reported that it had seen its role in this first three-year period as being to “establish a foundation for the ongoing collection of appropriate child mortality data, particularly within the public health system”. The committee’s primary concern, that “the country and the national health department lacks an overarching strategy for the health of children” would appear to have been addressed by the development of the Strategic Plan for Maternal, Newborn, Child and Women’s Health (MNCWH) and Nutrition in South Africa 2012-2016. However, much still remains to be achieved through effective implementation of all elements of that strategy. In relation to information systems, the committee emphasised the need to strengthen what it referred to as ‘essential data systems’, these being vital registration, the District Health Information system (DHIS), Demographic and Health Surveys (DHS), the Child healthcare Problem Identification Programme (Child PIP) and the Road to Health Booklet. Accordingly, it recommended modifications to death notification forms, the introduction of standardised children’s ward admission and discharge registers, improved collection and utilisation of DHIS data, and integration of Child PIP into quality improvement processes at hospital and district level. In order to drive these changes, it recommended the establishment of District Child Health Forums and Provincial Child Health Forums, which would “review and respond to local (district or provincial) child mortality data; hospital based workload, morbidity and mortality indicators; and primary healthcare child health programme (such as PMTCT, IMCI, EPI or nutrition) indicators”.

The NaPeMMCo report covered the 2008 to 2010 period.¹⁴²

This committee, also established in 2008, was tasked to “audit all perinatal and neonatal deaths occurring in the country and produce annual reports and a final triennial report in 2011”. The report noted that there are currently two national systems for gathering such data: the DHIS records stillbirths and neonatal deaths occurring within public sector facilities, whereas the Department of Home Affairs (DHA) records deaths occurring in public and private sector facilities as well as in the community. Data from the DHA are then forwarded to StatsSA for analysis. In addition, information on the pathological and health system causes of perinatal and neonatal deaths are recorded by the Perinatal Problem Identification Program (PPIP), which falls under the auspices of the Medical Research Council. These data are collected from maternity and neonatal wards in public sector facilities, but not from other children’s wards (which contribute to the Child PIP dataset). Except for DHA/StatsSA, all the above-mentioned databases collect data primarily in the public sector only. The NaPeMMCo report did include data about neonatal deaths occurring in some private hospitals. The report emphasised that good quality national data required a process of review at both the healthcare facility and provincial levels – “by both those who collect it and those who need to use it on a regular basis”. The establishment of Provincial Perinatal Morbidity and Mortality Committees (ProPeMMCo) was therefore recommended. There are increasingly refined methods available to help identify target areas for intervention, in terms of both the administrative areas (such as sub-districts) to select and the most important intervention to apply.¹⁵⁰

An excellent summary of the available data on neonatal mortality was also published by Velaphi (who chaired NaPeMMCo) and Rhoda in 2012.¹⁵¹ Noting that “South Africa is one of the countries in which neonatal mortality has remained the same or increased over the last 20 years”, the authors listed the key clinical interventions that were known to make a difference: “providing basic and comprehensive emergency obstetric care, use of antenatal steroids for women in preterm labour, training in immediate care of the newborn and neonatal resuscitation, and post-resuscitation management and ongoing neonatal care (e.g. [continuous positive airway pressure] CPAP), especially to babies who are born preterm”. Preterm birth has been highlighted in a major international call to action, which has documented 15 million such births and 1.1 million deaths from preterm complications per year globally.¹⁵² Another target for action has been in relation to pneumonia and diarrhoeal disease, cited as “the deadliest diseases for the world’s poorest children”.¹⁵³

As was detailed in the section on Mortality, StatsSA published a report on mortality and causes of death in children under five years, including a focus on diarrhoea and respiratory diseases, covering 2006 to 2009.⁵⁷ To address the time lag in the availability of the cause of death reports, child mortality indicators based on the Rapid Mortality Surveillance (RMS) system were also produced up to 2011.⁵⁹ The RMS data suggest a dramatic decline in the infant- and under-five mortality rates from 2009 to 2011.

South Africa’s mixed performance in relation to child health was particularly noted in the Child Development Index 2012 report.¹⁴⁸

The country’s ranking on this index fell 24 places between the periods 1995-1999 and 2005-2010, as it was overtaken by countries making greater progress. Two major contributors were poverty and HIV, which again underline the importance both of

the Child Care Grant and progress with access to PMCT and paediatric ART.

Given the international focus on child mortality, it is not surprising that reviews of available data from multiple countries have been published and progress tracked over time. Examples include a systematic analysis of available data on preterm birth in 184 countries between 1990 and 2010,¹⁵⁴ a systematic analysis of data on the causes of child mortality from 2000 to 2010,¹⁵⁵ a summary of the available data on progress from the United Nations Inter-agency Group for Child Mortality Estimation,¹⁵⁶ UNICEF's update on progress with improving child survival,¹⁵⁷ and reports from the Countdown to 2015 tracking of maternal, newborn and child health interventions.^{158,159} There have also been attempts to explore relationships between various variable and child health outcomes. These have included a modelling of the effects of health systems determinants on infant, child and maternal mortality¹⁶⁰ and exploration of the effect of maternal obesity on neonatal death in sub-Saharan Africa.¹⁶¹

The ongoing contestation between various estimates of under-five mortality, such as those issued by the United Nations Inter-agency Group for Child Mortality Estimation (UN IGME) and the Institute for Health Metrics and Evaluation (IHME), has also received attention.¹⁶² These authors offer a pragmatic conclusion and way forward: "Often differences are illustrative of the lack of reliable data and likely to decrease as more data become available. Improved transparency on methods and data used will help to improve understanding about the drivers of the differences". Locally, a very comprehensive review of under-five mortality statistics in South Africa for 1997-2007 was issued by the MRC Burden of Disease Unit in April 2012.¹⁶³ This team has identified why the IHME estimates can be questioned, and why the MDG Country Report estimate cannot be considered plausible. They have also suggested that the IGME estimates appear to be "more or less at the correct level". An updated graph showing the various modelled time series estimates of the under-five mortality rate is given in the appendix of this chapter (Figure 4).

Table 16: Child mortality and related indicators by province

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Infant mortality rate (deaths under 1 year per 1 000 live births)											
2006 ASSA2008	60.1	54.0	32.9	57.8	37.3	51.9	28.5	41.2	22.9	44.6	a
2006 Inter-agency group (2012)	-	-	-	-	-	-	-	-	-	50.0	b
2006 RMS 2011	-	-	-	-	-	-	-	-	-	46.1	c
2006 StatsSA	-	-	-	-	-	-	-	-	-	46.8	d
2006 VR adjusted	-	-	-	-	-	-	-	-	-	50.0	e
2007 ASSA2008	56.5	50.9	32.3	55.2	33.6	50.0	30.5	34.3	21.5	42.0	a
2007 Inter-agency group (2012)	-	-	-	-	-	-	-	-	-	46.8	b
2007 RMS 2011	-	-	-	-	-	-	-	-	-	47.0	c
2007 StatsSA	-	-	-	-	-	-	-	-	-	45.1	d
2007 VR adjusted	-	-	-	-	-	-	-	-	-	48.6	e
2008 ASSA2008	53.3	47.3	27.5	49.5	29.9	45.4	27.5	32.4	20.5	37.8	a
2008 Inter-agency group (2012)	-	-	-	-	-	-	-	-	-	44.9	b
2008 RMS 2011	-	-	-	-	-	-	-	-	-	46.9	c
2008 StatsSA	-	-	-	-	-	-	-	-	-	42.1	d
2009 ASSA2008	50.0	43.7	25.3	45.3	28.3	41.4	26.9	30.8	20.1	35.2	a
2009 Inter-agency group (2012)	-	-	-	-	-	-	-	-	-	41.4	b
2009 RMS 2011	-	-	-	-	-	-	-	-	-	39.6	c
2009 StatsSA	-	-	-	-	-	-	-	-	-	40.6	d
2010 ASSA2008	47.9	41.9	25.2	44.0	28.2	38.9	26.3	30.7	19.7	34.5	a
2010 Inter-agency group (2012)	-	-	-	-	-	-	-	-	-	35.5	b
2010 RMS 2011	-	-	-	-	-	-	-	-	-	37.0	c
2010 StatsSA	-	-	-	-	-	-	-	-	-	39.1	d
2011 ASSA2008	46.5	40.7	24.7	43.1	27.7	37.5	25.5	30.1	19.0	33.8	a
2011 Inter-agency group (2012)	-	-	-	-	-	-	-	-	-	34.6	b
2011 RMS 2011	-	-	-	-	-	-	-	-	-	29.8	c
2011 StatsSA	-	-	-	-	-	-	-	-	-	37.9	d
2012 ASSA2008	45.4	39.8	24.3	42.4	27.2	36.4	24.8	29.6	18.3	33.2	a
2013 ASSA2008	44.4	39.1	23.8	41.7	26.7	35.6	24.1	29.1	17.7	32.5	a
2014 ASSA2008	43.6	38.5	23.4	40.9	26.2	35.0	23.5	28.5	17.1	31.9	a
2015 ASSA2008	42.8	37.8	22.9	40.3	25.8	34.3	22.9	28.0	16.5	31.3	a
Low birth weight rate (% live births <2500g)											
2009 PPIP CHC	-	-	-	-	-	-	-	-	-	8.5	f
2009 PPIP DH	-	-	-	-	-	-	-	-	-	12.0	f
2009 PPIP NC	-	-	-	-	-	-	-	-	-	26.6	f
2009 PPIP PT	-	-	-	-	-	-	-	-	-	18.2	f
2009 PPIP RH	-	-	-	-	-	-	-	-	-	15.5	f
2009 DHIS	12.8	15.2	12.1	11.8	10.3	8.8	19.0	13.9	14.8	12.3	g
2010 DHIS	12.6	14.5	13.0	12.0	10.0	9.8	20.0	14.5	16.0	12.7	g
2011 DHIS	12.3	13.1	15.8	11.9	10.1	12.3	18.5	13.3	15.5	13.2	g

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Neonatal death rate (NNDR) (deaths <28 days old per 1 000 live births)											
2009 DHIS	13.5	13.9	10.2	10.4	11.8	11.2	12.9	11.3	6.1	10.9	h
2009 Inter-agency group (2012)	-	-	-	-	-	-	-	-	-	20.1	b
2009 PPIP CHC	-	-	-	-	-	-	-	-	-	2.1	i
2009 PPIP DH	-	-	-	-	-	-	-	-	-	12.3	i
2009 PPIP NC	-	-	-	-	-	-	-	-	-	18.1	i
2009 PPIP PT	-	-	-	-	-	-	-	-	-	16.5	i
2009 PPIP RH	-	-	-	-	-	-	-	-	-	13.5	i
2009 Private hospitals	-	-	-	-	-	-	-	-	-	4.0	j
2009 RMS 2011	-	-	-	-	-	-	-	-	-	13.6	k
2010 DHIS	15.1	16.0	11.4	10.4	12.0	10.1	13.5	15.4	5.5	11.6	h
2010 Inter-agency group (2012)	-	-	-	-	-	-	-	-	-	19.6	b
2010 RMS 2011	-	-	-	-	-	-	-	-	-	13.4	k
2011 DHIS	16.7	15.5	13.4	10.7	12.3	10.6	14.6	13.1	5.9	12.3	h
2011 Inter-agency group (2012)	-	-	-	-	-	-	-	-	-	19.2	b
2011 RMS 2011	-	-	-	-	-	-	-	-	-	13.9	k
Number of under-5 deaths											
2006 StatsSA	-	-	-	-	-	-	-	-	-	64 346	l
2007 StatsSA	-	-	-	-	-	-	-	-	-	61 708	l
2008 StatsSA	-	-	-	-	-	-	-	-	-	61 062	l
2009 StatsSA	-	-	-	-	-	-	-	-	-	50 471	l
Perinatal care index (perinatal MR / LBWR)											
2009 PPIP CHC	-	-	-	-	-	-	-	-	-	1.15	f
2009 PPIP DH	-	-	-	-	-	-	-	-	-	2.54	f
2009 PPIP NC	-	-	-	-	-	-	-	-	-	2.39	f
2009 PPIP PT	-	-	-	-	-	-	-	-	-	2.37	f
2009 PPIP RH	-	-	-	-	-	-	-	-	-	2.43	f
Perinatal mortality rate (deaths <8 days old per 1 000 total births)											
2009 PPIP =>500g	-	-	-	-	-	-	-	-	-	35.3	m
2009 PPIP CHC	-	-	-	-	-	-	-	-	-	10.4	m
2009 PPIP DH	-	-	-	-	-	-	-	-	-	33.3	m
2009 PPIP NC	-	-	-	-	-	-	-	-	-	71.4	m
2009 PPIP PT	-	-	-	-	-	-	-	-	-	48.0	m
2009 PPIP RH	-	-	-	-	-	-	-	-	-	41.7	m
2009 DHIS	33.0	39.8	29.8	32.9	32.1	35.1	32.4	34.6	27.9	32.3	g
2010 DHIS	35.3	42.8	29.7	31.6	32.3	33.3	39.0	37.6	25.6	32.4	g
2011 DHIS	36.5	40.4	30.7	32.4	32.0	33.7	37.7	35.5	24.1	32.5	g
2011 PPIP CHC										9.6	n
2011 PPIP DH										33.4	n
2011 PPIP NC										63.3	n
2011 PPIP PT										56.2	n
2011 PPIP RH										39.5	n
Stillbirth rate (per 1 000 total births)											
2009 PPIP CHC	-	-	-	-	-	-	-	-	-	8.3	f
2009 PPIP DH	-	-	-	-	-	-	-	-	-	21.3	f
2009 PPIP NC	-	-	-	-	-	-	-	-	-	54.3	f
2009 PPIP PT	-	-	-	-	-	-	-	-	-	32.1	f
2009 PPIP RH	-	-	-	-	-	-	-	-	-	28.5	f
2009 Private hospitals	-	-	-	-	-	-	-	-	-	7.5	j
2009 DHIS	21.6	29.3	21.1	24.1	21.7	24.8	22.0	24.7	22.9	23.0	g
2010 DHIS	22.4	30.9	20.3	22.8	21.9	24.3	27.3	25.2	20.8	22.7	g
2011 DHIS	22.3	29.1	21.2	23.4	21.3	24.1	25.0	24.6	19.1	22.5	g
Under 5 mortality rate (deaths under 5 years per 1 000 live births)											
2006 ASSA2008	86.2	79.0	49.1	85.6	54.3	78.9	40.9	61.0	32.1	65.4	a
2006 IHME (2010)	-	-	-	-	-	-	-	-	-	57.4	o
2006 Inter-agency group (2012)	-	-	-	-	-	-	-	-	-	75.8	b
2006 RMS 2011	-	-	-	-	-	-	-	-	-	68.9	c
2006 StatsSA	-	-	-	-	-	-	-	-	-	72.2	d
2006 VR adjusted	-	-	-	-	-	-	-	-	-	75.0	e
2007 ASSA2008	82.1	74.8	48.4	81.6	50.2	75.0	41.2	54.1	30.0	61.9	a
2007 IHME (2010)	-	-	-	-	-	-	-	-	-	57.1	o

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
2007 Inter-agency group (2012)	-	-	-	-	-	-	-	-	-	71.1	b
2007 RMS 2011	-	-	-	-	-	-	-	-	-	67.2	c
2007 StatsSA	-	-	-	-	-	-	-	-	-	67.8	d
2007 VR adjusted	-	-	-	-	-	-	-	-	-	71.8	e
2008 ASSA2008	76.7	69.4	41.9	73.8	43.4	68.7	39.4	48.3	28.4	55.7	a
2008 IHME (2010)	-	-	-	-	-	-	-	-	-	56.0	o
2008 Inter-agency group (2012)	-	-	-	-	-	-	-	-	-	66.6	b
2008 RMS 2011	-	-	-	-	-	-	-	-	-	66.9	c
2008 StatsSA	-	-	-	-	-	-	-	-	-	63.1	d
2009 ASSA2008	71.1	63.4	37.9	66.8	40.3	61.9	38.7	45.5	27.7	50.9	a
2009 IHME (2010)	-	-	-	-	-	-	-	-	-	53.4	o
2009 Inter-agency group (2012)	-	-	-	-	-	-	-	-	-	61.3	b
2009 RMS 2011	-	-	-	-	-	-	-	-	-	56.5	c
2009 StatsSA	-	-	-	-	-	-	-	-	-	59.3	d
2010 ASSA2008	67.7	60.2	38.0	64.5	40.6	57.7	38.2	45.9	27.4	49.9	a
2010 GBD 2010 female	-	-	-	-	-	-	-	-	-	50.2	p
2010 GBD 2010 male	-	-	-	-	-	-	-	-	-	50.2	p
2010 IHME (2010)	-	-	-	-	-	-	-	-	-	50.9	o
2010 Inter-agency group (2012)	-	-	-	-	-	-	-	-	-	52.6	b
2010 RMS 2011	-	-	-	-	-	-	-	-	-	53.1	c
2010 StatsSA	-	-	-	-	-	-	-	-	-	56.6	d
2011 ASSA2008	65.3	58.0	37.1	62.7	39.9	54.7	36.8	44.9	26.5	48.8	a
2011 IHME (2011)	-	-	-	-	-	-	-	-	-	50.7	q
2011 Inter-agency group (2012)	-	-	-	-	-	-	-	-	-	46.7	b
2011 RMS 2011	-	-	-	-	-	-	-	-	-	42.2	c
2011 StatsSA	-	-	-	-	-	-	-	-	-	54.3	d
2012 ASSA2008	63.4	56.5	36.2	61.3	39.1	52.7	35.4	43.7	25.6	47.7	a
2013 ASSA2008	62.0	55.4	35.3	60.0	38.2	51.4	34.1	42.6	24.7	46.7	a
2014 ASSA2008	60.8	54.4	34.4	58.9	37.3	50.4	33.1	41.6	23.9	45.7	a
2015 ASSA2008	59.6	53.5	33.7	57.8	36.6	49.6	32.2	40.9	23.1	44.8	a

Reference notes (indicator definitions from page 310 and references from page 315):

- a ASSA2008.⁶²
- b Child Mortality 2012 IGME.¹⁶⁴
- c RMS 2011.⁵⁹ The U5MR and IMR in the RMS reports are calculated from VR for the period up to 2009 and from the RMS for the period 2010-2011, once the data have been adjusted for under-registration.
- d StatsSA Mid-year estimates.³⁴ 2011 mid-year estimates. IMR/U5MR assumption used in population projections.
- e U5MR 2012.¹⁶³ Calculated by applying the completeness adjustment implied by Darikwa to vital registration data. Darikwa TB. Estimating the level and trends of child mortality in South Africa, 1996-2006. Thesis submitted in partial fulfilment of the Degree of Master of Philosophy in the Faculty of Commerce University of Cape Town; 2009.
- f Saving Babies 2008-9.¹⁶⁵ Community Health Centres (CHC), District Hospitals (DH), National Central Hospitals (NCH), Provincial Tertiary Hospitals (PT), Regional Hospitals (RH).
- g DHIS. Data extracted June 2012. Data for financial year from April of the year to March of the following year (not calendar year).
- h DHIS. Facility-based deaths. Data extracted June 2012. Data for financial year from April of the year to March of the following year (not calendar year).
- i Saving Babies 2008-9.¹⁶⁵ NNDR for births => 500g. Community Health Centres (CHC), District Hospitals (DH), National Central Hospitals (NCH), Provincial Tertiary Hospitals (PT), Regional Hospitals (RH).
- j NaPeMMCo 2008-2010.¹⁴² Year of data not specified. Presumed to be an average of several years' data around 2009. The three large hospital groups provided data from a total of 117 hospitals with delivery numbers for the individual hospitals ranging between around 4000 and less than 50 per year.
- k RMS 2011.⁵⁹ The NMR is estimated from the registered deaths (adjusted for under-registration) for the period 2006-2009 and the DHIS (adjusted for under-coverage, relative to the registered deaths and the incompleteness of the vital registration) for the period 2010-2011.
- l StatsSA U5 Mortality 2006-10.⁵⁷ Based on Stats SA Causes of Death data sets. Not adjusted for under-reporting. Estimated completeness of death registration for children under five years is around 87%.
- m Saving Babies 2008-9.¹⁶⁵ PNMR for births => 500g. The PNMR is an extrapolation of PPIP data. This is only an estimate and trends should not be assumed as there were about a third more births and deaths registered on PPIP in 2008-9 compared with 2006-7. Community Health Centres (CHC), District Hospitals (DH), National Central Hospitals (NCH), Provincial Tertiary Hospitals (PT), Regional Hospitals (RH).
- n NaPeMMCo 2010-2011.¹⁶⁶ PNMR for births => 500g. The PNMR is an extrapolation of PPIP data. Community Health Centres (CHC), District Hospitals (DH), National Central Hospitals (NCH), Provincial Tertiary Hospitals (PT), Regional Hospitals (RH).
- o IHME Maternal and Child Mortality.¹⁶⁷
- p Global Burden of Disease 2010.⁶¹
- q Lozano et al. 2011.¹⁴⁴

Child health status and services

Since 2005, the South African Child Gauge has provided a unique summary of the determinants of child health, as well as of data on access to healthcare services.¹⁶⁸ A particularly important section covers the “Children Count – Abantwana Babalulekile” initiative, which provides “child-centred data to monitor progress and track the realisation of children’s socio-economic rights”. More detailed data can be accessed at the project’s web site: www.childrencount.ci.org.za. The report explains: “‘Child-centred’ data does not only mean the use of data about children specifically. It also means using national population or household data, but analysing it at the level of the child. This is important, because the numbers can differ enormously depending on the unit of analysis. For example, national statistics describe the unemployment rate, but only a child-centred analysis can tell how many children live in households where no adult is employed. National statistics show what proportion of households is without adequate sanitation, but when a child-centred analysis is used, the proportion is significantly higher”. One of the reports included shows the dramatic changes in access to Child Support Grants that have occurred since 2005, as eligibility criteria have shifted. From 2005 to 2008, the grant was restricted to those aged 0-13 years. In 2009 it was extended to under 15s, in 2010 to under 16s, in 2011 to under 17s, and in 2012 those aged 17 years became eligible. The number of child beneficiaries of this type of grant has increased from 5 913 719 in 2005 to 11 227 832 in 2012. However, these data also emphasise the modest quantum of such grants, which have increased from R180 per month in 2005 to R280 per month in 2012. Data are also presented on access to Foster Child Grants and Care Dependency Grants. Two of the specific indicators tracked in terms of child health are number and proportion of children living far from their health facility (‘far’ being defined as requiring more than 30 minutes to reach the facility, irrespective of the mode of transport) and the number and proportion of children living in households where there is reported child hunger. No change in the first indicator has been detected between 2002 (36.4% of children) and 2010 (36.7%), based on data from the StatsSA General Household Surveys, but a marked socio-economic gradient was demonstrated (with twice as many children in the poorest quintile having to travel far compared with those in the richest quintile). While significant progress has been achieved in relation to child hunger, in 2010, three million African children, equivalent to almost 20% of the total African child population, were estimated as living in households that reported child hunger. By contrast, only 13% of Coloured children, 5% of Asian children and no White children lived in such households.

Table 17: Child health indicators by province

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Children under 5 years weighing rate											
2009 DHIS		85.0	89.6	76.0	79.5	90.9	86.1	89.1	70.5	82.0	a
2010 DHIS	84.2	87.1	88.4	77.5	77.4	87.4	82.0	87.5	71.8	81.9	a
2011 DHIS	85.4	86.6	88.5	89.0	77.9	85.6	80.5	90.4	74.5	84.8	a
Diarrhoea incidence under 5 years (per 1 000)											
2009 DHIS	110.9	70.3	63.7	197.8	185.5	78.1	144.3	112.2	123.5	127.4	a
2010 DHIS	104.2	64.6	64.5	159.2	180.7	71.4	142.9	102.8	93.9	112.4	a
2011 DHIS	89.1	57.4	55.4	139.1	164.9	40.0	97.0	71.9	94.7	95.9	a
Not gaining weight under 5 years rate (%)											
2009 DHIS	0.7	2.4	0.5	1.3	0.9	1.0	2.2	1.1	2.9	1.2	a
2010 DHIS	0.7	2.0	0.5	1.1	0.6	1.0	1.9	1.2	2.2	1.0	a
2011 DHIS	0.6	1.7	0.4	1.0	0.5	0.6	2.1	1.2	2.4	0.9	a
Number of orphans											
2009 maternal/double (GHS)	306 000	124 000	168 000	512 000	129 000	142 000	29 000	127 000	51 000	1 588 000	b
2009 maternal/double ASSA2008	242 149	109 106	299 204	472 462	138 716	152 111	19 237	129 691	86 128	1 606 598	c
2010 maternal/double (GHS)	286 000	118 000	167 000	507 000	118 000	147 000	31 000	116 000	52 000	1 543 000	d
2010 maternal/double ASSA2008	246 962	112 775	317 132	486 793	139 820	158 836	20 105	134 158	88 492	1 668 901	c
2011 maternal/double ASSA2008	249 595	114 801	330 393	495 545	141 975	163 174	20 986	136 964	91 301	1 712 677	c
2012 maternal/double ASSA2008	250 750	115 485	339 861	499 933	144 639	165 717	21 853	138 276	94 271	1 742 924	c
2013 maternal/double ASSA2008	250 916	115 171	346 199	500 999	147 493	167 038	22 680	138 459	97 170	1 763 010	c
2014 maternal/double ASSA2008	250 321	114 185	349 785	499 334	150 322	167 418	23 450	137 851	99 821	1 774 794	c
2015 maternal/double ASSA2008	249 084	112 728	350 770	495 337	152 965	167 040	24 124	136 669	101 947	1 779 248	c
Orphanhood (%)											
2009 maternal/double (GHS)	11.1	11.6	5.2	12.0	5.5	9.7	6.6	10.0	2.9	8.5	b
2010 maternal/double (GHS)	10.7	11.0	5.0	11.9	5.2	10.1	7.3	9.1	2.9	8.4	d
Pneumonia incidence rate under 5 years (per 1 000)											
2009 DHIS	66.8	110.0	58.3	178.8	60.9	56.4	114.7	109.3	83.3	97.4	a
2010 DHIS	61.6	96.1	59.3	147.8	54.6	43.7	104.3	82.8	68.7	83.6	a
2011 DHIS	58.2	89.3	56.6	145.5	53.9	38.6	92.2	70.0	72.1	80.3	a
Severe malnutrition under 5 years incidence (per 1 000)											
2009 DHIS	5.0	5.8	2.9	8.0	4.0	5.5	5.6	7.2	5.9	5.5	a
2010 DHIS	4.9	4.9	3.7	7.1	4.1	3.8	5.1	6.7	2.7	4.9	a
2011 DHIS	3.8	4.1	2.8	6.8	4.4	2.8	4.4	5.3	3.2	4.3	a

Reference notes (indicator definitions from page 310 and references from page 315):

- a DHIS. Data extracted June 2012. Data for financial year from April of the year to March of the following year (not calendar year).
- b SA Child Gauge 2010/2011.¹⁶⁹ Based on GHS 2009; StatsSA. Orphan definitions used here are mutually exclusive and additive. This suggests 8% of all children are maternal/double orphans. Children are defined as people aged 0 - 17 years. Population numbers are rounded off to the nearest thousand.
- c ASSA2008.⁶²
- d Children Count web site. Based on GHS 2010; StatsSA. Children are defined as people aged 0 - 17 years. Population numbers are rounded off to the nearest thousand.

Immunisation

Estimates of vaccination coverage from both survey and routine data sources have long been bedevilled by data quality issues, as well as by questions about the appropriateness of the population denominators used. The questions raised about the reliability of the Census 2011 results are of particular concern in this regard, as the increase in the number of children under one may reduce routine data coverage by more than 10 percentage points. A stakeholder meeting in December 2012 debated the challenges of existing data and documented requirements for an immunisation coverage survey to obtain an accurate, current estimate of coverage. An assessment of the view of vaccination programme managers was reported in 2012, combined with a systematic review of the available evidence for the interventions proposed by these managers.¹⁷¹ As expected,

there was support for improved training, supervision, audit and feedback, all of which depend on access to reliable data.

Globally, there have been assessments of the impact of rotavirus vaccine introduction,¹⁷² and of progress in relation to measles control.^{173,174} Projections have also been made of the potential health and economic consequences of expanding access to rotavirus vaccine in the future.¹⁷⁵ Extensive estimates of coverage at a national level are also produced annually by UNICEF/WHO.¹⁷⁶ The methods used to obtain these estimates have previously been reported,¹⁷⁷ and have recently been updated to incorporate computational logic methods.^{178,179}

Table 18: Immunisation indicators by province

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
BCG coverage (%)											
2009 DHIS	70.8	92.7	122.2	76.1	108.5	90.1	88.9	89.2	88.4	91.9	a
2010 DHIS	80.7	93.6	119.2	83.7	110.3	79.9	95.9	85.1	79.5	93.3	a
2011 DHIS	92.6	96.9	117.3	91.7	122.5	97.4	94.0	91.1	62.4	98.0	a
2011 UNICEF/WHO	-	-	-	-	-	-	-	-	-	78.0	b
DTP3 coverage (%)											
2009 DHIS	86.2	77.8	115.5	95.1	119.0	108.7	97.1	82.6	94.9	99.4	a
2010 DHIS	52.0	84.8	109.2	92.2	94.1	78.6	97.6	90.2	89.8	88.2	a
2011 DHIS	85.7	99.6	105.0	105.2	109.0	90.9	100.2	93.5	93.6	99.3	a
2011 UNICEF/WHO	-	-	-	-	-	-	-	-	-	72.0	b
Immunisation coverage of children <1 year (%)											
2009 DHIS	90.6	87.0	113.7	84.6	99.6	92.8	92.4	86.4	102.2	95.3	a
2010 DHIS	78.5	83.8	111.3	85.4	93.7	69.8	91.9	77.3	90.8	89.2	a
2011 DHIS	84.2	91.9	114.6	98.6	96.7	73.9	95.1	82.9	89.5	95.2	a
Measles 1st dose coverage (%)											
2009 DHIS	94.0	88.4	118.4	87.0	103.6	97.7	91.5	89.2	105.1	98.6	a
2010 DHIS	87.9	87.6	110.9	88.4	100.1	88.6	92.0	86.8	94.2	94.5	a
2011 DHIS	95.2	94.7	113.9	100.6	109.7	89.4	98.1	92.3	92.6	100.9	a
OPV 1 coverage (%)											
2009 DHIS	91.4	97.4	128.3	99.6	124.1	112.7	85.2	96.0	111.3	107.8	a
2010 DHIS	84.7	95.1	114.9	101.5	115.0	99.8	88.6	92.3	97.1	101.3	a
2011 DHIS	92.9	99.6	108.8	110.1	128.1	101.3	105.2	88.8	95.2	105.1	a
PCV7 3rd dose coverage (%)											
2009 DHIS	13.0	10.0	30.1	25.4	33.2	23.5	25.8	24.5	16.2	23.3	a
2010 DHIS	42.2	70.2	94.5	80.3	80.8	53.8	80.4	62.0	71.0	72.8	a
2011 DHIS	80.9	90.8	102.8	97.5	105.6	91.4	92.6	86.2	84.5	94.1	a
2011 UNICEF/WHO	-	-	-	-	-	-	-	-	-	72.0	b
RV 2nd dose coverage (%)											
2009 DHIS	24.3	12.2	46.6	40.6	42.8	39.3	33.2	29.7	19.7	34.7	a
2010 DHIS	40.9	77.1	94.1	81.2	74.1	60.6	83.8	61.8	63.4	72.3	a
2011 DHIS	77.6	97.6	111.8	105.2	109.4	91.6	101.1	87.9	83.6	98.2	a
2011 UNICEF/WHO	-	-	-	-	-	-	-	-	-	72.0	b

Reference notes (indicator definitions from page 310 and references from page 315):

- a DHIS. Data extracted June 2012. Data for financial year from April of the year to March of the following year (not calendar year).
- b Immunisation 2011.¹⁷⁶ Estimates derived by review of available data (including routine service delivery data and surveys), informed and constrained by a set of heuristics.

Nutrition

Context	The increasing global focus on non-communicable diseases has raised the profile of poor nutrition as a risk factor. Some interventions have been included in the Strategic Plan for Maternal, Newborn, Child and Women's Health (MNCWH) and Nutrition in South Africa 2012-2016.
New data sources	Nationally, new data have been reported in the: <ul style="list-style-type: none"> • National Income Dynamics Study (NiDS) Wave 1 and Wave 2 • District Health Information System (DHIS) Internationally, reports of interest include: <ul style="list-style-type: none"> • Progress towards MDG1, as reported by the Nutrition Impact Model Study Group (Child Growth)
Key issues and trends	Much is expected from the planned South African National Health and Nutrition Examination Survey (SANHANES), but some data have been forthcoming from the two completed waves of the National Income Dynamics Study (NiDS).

Growth monitoring and promotion, with early identification and management of growth failure, is an integral part of child health services, as is supplementation with vitamin A. Together with regular deworming and correct implementation of the Integrated Management of Childhood Illnesses (IMCI) package (including advice on infant feeding), these are among the nutrition-related interventions included in the Strategic Plan for Maternal, Newborn, Child and Women's Health (MNCWH) and Nutrition in South Africa 2012-2016.¹³⁶

Some early data on nutritional status has been reported from the two completed waves of the National Income Dynamics Study (NiDS).¹⁸⁰ However, these have been issued with the caveat that the analyses are "descriptive, preliminary and very much intended to illustrate the potential of the NiDS panel". In the first wave of NiDS, 33% of women and 11% of men aged 15 and older were classified as obese on the basis of their body mass index. In the first wave of NiDS, 17% of children aged 6 months to 14 years were classified as stunted (height-for-age z-score two or more standard deviations below the WHO reference population). Although about 9% of children were classified as stunted in both waves, about 12% of children changed classification from not stunted to stunted between waves, and half the children who were classified as stunted in Wave 1, no longer being classified as stunted in Wave 2.

Considerable new data are expected to be generated from the first South African National Health and Nutrition Examination Survey (SANHANES-1) and from subsequent collection in the longitudinal component of the study. Critically, in contrast to the self-reported data relied on for the General Household Survey, SANHANES will obtain questionnaire-based data as well as health measurements through clinical examination and the collection of blood specimens using mobile clinics.

Data from surveys that have used the Community Childhood Hunger Identification Project (CCHIP) index to measure food security has shown persistently high levels of food insecurity in South Africa between 1999 and 2008.¹⁸¹ A nationally-representative cross-sectional survey also documented extensive reliance on 'street foods' (foods and beverages provided by the informal sector, which include snacks and soft drinks) and fast foods.¹⁸² Poor eating habits were also demonstrated in a longitudinal study of adolescents living in Soweto and Johannesburg, in all three environments examined (in the home, at school and in the community).¹⁸³ The policy implications of unhealthy eating in South Africa have been explored by Igumbor et al., who have called for urgent action,

including education, support for healthy foods and the regulation of 'Big Food' (defined as the large commercial entities that dominate the food and beverage environment).¹⁸⁴ While breastfeeding policies have largely occurred in the context of HIV policy, data from a cluster randomised trial of exclusive breastfeeding promotion showed how difficult it was for mothers, and working mothers in particular, to maintain breastfeeding.¹⁸⁵

Internationally, the Nutrition Impact Model Study Group (Child Growth) has reported on trends in mild, moderate, and severe stunting in 141 developing countries.¹⁸⁶ The MDG 1 target is the halving the prevalence of weight-for-age z-scores below -2 between 1990 and 2015 or reaching a prevalence of 2.3% or lower. Based on available national data, anthropometric status "worsened in sub-Saharan Africa until the late 1990s and improved thereafter". The Group called for increased "investment in pro-poor food and primary care programmes".

Table 19: Nutrition indicators by province

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Obesity (%)											
2008 NYRBS	4.0	4.7	9.7	5.4	2.8	6.1	5.0	3.9	5.6	5.3	a
2008 under 15 years	-	-	-	-	-	-	-	-	-	10.0	b
Overweight (%)											
2008 NYRBS	17.3	16.3	22.4	25.5	13.5	21.6	17.9	15.7	19.9	19.7	a
2008 under 15 years	-	-	-	-	-	-	-	-	-	11.7	b
Stunting (%)											
2008 NYRBS	17.5	14.7	13.2	11.7	12.8	11.3	19.4	12.3	9.7	13.1	a
2008 under 15 years	-	-	-	-	-	-	-	-	-	17.1	b
Underweight (%)											
2008 NYRBS	9.6	10.0	6.7	5.0	13.8	4.5	14.1	12.3	6.5	8.4	a
2008 under 10 years	-	-	-	-	-	-	-	-	-	9.6	c
Vitamin A coverage children 12-59 months (%)											
2008 DHIS	31.6	41.6	34.8	27.3	38.3	25.8	32.8	30.9	32.0	32.2	d
2009 DHIS	36.6	38.0	40.8	30.3	30.6	27.8	27.2	26.1	38.2	33.9	d
2010 DHIS	36.5	39.1	43.7	32.8	30.3	29.1	26.2	27.0	32.3	34.6	d
2011 DHIS	45.1	47.9	47.7	42.8	46.8	39.1	32.5	36.8	38.0	43.4	d
Vitamin A coverage infants 6-11 months (%)											
2008 DHIS	90.3	95.8	109.0	98.8	111.7	96.9	114.4	97.2	93.4	100.2	d
2009 DHIS	93.2	86.3	110.1	101.9	105.7	103.5	94.1	89.6	95.0	100.0	d
2010 DHIS	93.6	90.5	103.7	104.4	102.6	97.6	90.6	89.3	80.1	97.4	d
2011 DHIS	102.7	102.3	109.5	121.8	122.9	103.4	103.2	95.7	82.1	107.9	d
Wasting (%)											
2008 NYRBS	4.4	4.4	4.1	1.9	6.8	3.6	10.6	7.8	3.7	4.4	a
2008 under 5 years	-	-	-	-	-	-	-	-	-	4.7	e

Reference notes (indicator definitions from page 310 and references from page 315):

- a NYRBS 2008.¹⁸⁷ Learners in grades 8-11.
b NiDS Health Wave 1.¹⁸⁸ Children aged six months to 14 years.
c NiDS Health Wave 1.¹⁸⁸ Children aged six months to 9 years.
d DHIS. Data extracted June 2012. Data for financial year from April of the year to March of the following year (not calendar year).
e NiDS Health Wave 1.¹⁸⁸ Children aged six months to 4 years.

Non-communicable diseases

Context	Non-communicable diseases are now recognised as a major health challenge of the 21st century. Globally, a comprehensive monitoring framework, including indicators and voluntary targets for the prevention and control of non-communicable diseases are being developed and are expected to serve before the 66th World Health Assembly in May 2013.
New data sources	Nationally, new data have been reported in the: <ul style="list-style-type: none"> • National Income Dynamics Study (NiDS) Wave 1 and Wave 2 • SAGE Wave 1 • StatsSA General Household Survey (GHS) 2011 • District Health Information System (DHIS) Internationally, reports of interest include: <ul style="list-style-type: none"> • World Health Statistics 2012 • World Heart Federation. Urbanization and cardiovascular disease: Raising heart-healthy children in today's cities (2012) • Women Deliver. Delivering Cervical Cancer Prevention in the Developing World (2011) • The Lancet Non-communicable diseases series (February 2013)
Key issues and trends	Current routine collection and periodic survey data sources do not provide high quality data about the prevalence of NCDs. However, much is expected from the longitudinal study components of the NiDS, as well as from SANHANES. Steps have been taken to revitalise the South African National Cancer Registry.

The World Health Statistics 2012 included global estimates of the burden of non-communicable diseases (NCDs).¹⁸⁹ It was stated that, of the estimated 57 million global deaths in 2008, 36 million (63%) were due to NCDs. Where before these had been regarded as diseases of affluence, in 2008 about 80% of all NCD deaths occurred in low- and middle-income countries. A higher proportion (48%) of these deaths occurred in people under the age of 70 in low- and middle-income countries than in high-income countries (26%). The probability of dying prematurely (between the ages of 30 and 70 years) from an NCD was estimated to be highest in sub-Saharan Africa, Eastern Europe and parts of Asia.

In preparation for the United Nations high-level meeting on NCDs in September 2011, the National Department of Health held a two-day national NCD Summit, which proposed the following ten targets:

- reduce the relative premature mortality (under 60 years of age) from non-communicable diseases by at least 25% by 2020;
- reduce tobacco use by 20% by 2020;
- reduce the relative per capita consumption of alcohol by 20% by 2020;
- reduce mean population intake of salt to <5 grams per day by 2020;
- reduce the percentage of people who are obese and/or overweight by 10% by 2020;
- reduce the prevalence of people with raised blood pressure by 20% by 2020 (through lifestyle and medication);
- screen all women at least every 5 years for cervical cancer by 2020;
- screen all men above 40 years of age for prostate cancer by 2020;
- increase the percentage of people controlled for hypertension, diabetes and asthma by 30% by 2020; and

- increase the number of people screened and treated for mental health by 30% by 2030.

Significant progress has been achieved in a developing a comprehensive monitoring framework, including indicators and voluntary targets for the prevention and control of non-communicable diseases.^{190,191} The final document is expected to serve before the 66th World Health Assembly in May 2013. The current draft lists 25 indicators and nine voluntary targets. In October 2012, Beaglehole and colleagues published a commentary on this process in the Lancet.¹⁹² They argued that, among the key criteria for choosing such targets should be that baseline data and robust methods for assessing progress were available. They therefore proposed that a single overarching NCD goal be set, and suggested the catchphrase '25 by 25', based on the goal of a 25% reduction in the probability of dying from the four main NCDs for people aged 30-70 years by 2025. They then suggested five initial targets:

- a 40% relative reduction in prevalence of tobacco use, including smokeless tobacco, by 2025;
- achieving the WHO target of 5g of salt intake per adult per day, by 2025;
- increase coverage of multidrug therapy, preferably fixed dose combination therapy, to at least 50% for people older than 50 years whose risk of a heart attack or stroke in the next 10 years is 30% or more, or for anyone who has already had a heart attack or stroke;
- a 10% relative reduction in per capita adult alcohol consumption by 2025; and
- a 10% relative reduction in adult inactivity levels by 2025.

Locally, much of the data to track progress in relation to NCDs will need to come from routine sources (such as DHIS), and from specific cross-sectional surveys and longitudinal studies. As there are no plans to repeat the South Africa Demographic and Health Survey, data will be obtained from the South African National HIV,

Behaviour and Health Survey 2012 (SABSSM4), the South African National Health and Nutrition Examination Survey (SANHANES), the National Income Dynamics Study (NiDS), the Study on Global AGEing and Adult Health (SAGE),¹⁹³ as well as from the annual StatsSA General Household Surveys (GHS). Data from NiDS have already been used to prepare discussion documents, for instance exploring the interaction between mental health and socio-economic status.¹⁹⁴ NiDS Wave 1 data on the prevalence of obesity and hypertension have also been issued.¹⁸⁸ While difficult to extrapolate to the national level, data from local cohorts and demographic surveillance sites will also illuminate this area. Recent examples have included data on the cardiovascular risk profile of a Bellville South cohort,¹⁹⁵ and the prevalence of hypertension and obesity in the Hlabisa Demographic Surveillance Site (DSS).¹⁹⁶

Internationally, the Lancet has continued to publish series of articles on NCDs, including on hypertension in developing countries,¹⁹⁷ epilepsy in poor regions of the world¹⁹⁸ and self-harm and suicide in adolescents.¹⁹⁹ Although based on dated information, taken from the World Health Survey 2002 to 2004, a review of data from 41 countries underpinned the view that NCDs are not merely disease of the wealthy.²⁰⁰ Setting priorities at a global and a national level will not be simple.²⁰¹ One potential approach is to identify 'best-buys' in terms of the comparative value for money, in the form of cost per disability life year gained.²⁰² However, this group added a final warning that is worth considering: "A final point is that efficiency represents but one of many criteria that need to be taken into account when allocating resources or determining priorities. In particular, efficient allocation of resources may not be fair. For example, treatment of schizophrenia may not be one of the most cost-effective options, but withholding effective care for this severe, debilitating condition is likely to be considered highly unjust. This speaks to the need for careful and inclusive deliberation about how to develop health systems in a way that ensures not only good value for money but also equal access and financial protection for those in need (including poor and vulnerable people)".

In February 2013, this series was extended,^c with calls for embedding NCDs in the post-2015 development agenda,²⁰³ a stepwise approach to country actions, with continual monitoring of progress,²⁰⁴ and careful attention to particularly vulnerable groups which might not have equitable access to interventions.²⁰⁵ Two of the papers encapsulated the debate about how best to set targets and indicators of progress. Beaglehole et al.²⁰⁶ noted that the lessons from the MDGs, and particularly the women's and children's health communities should be heeded, and that "a small group of indicators is more helpful than a long and inclusive list". In contrast, Hogerzeil and colleagues drew attention to the challenges that had been experienced in relation to tracking progress with MDG 8, dealing with access to medicines.²⁰⁷ They noted that, at a November 2012 meeting, WHO member states agreed on a set of indicators for medicines and technologies for NCDs, including "(1) drug treatment to prevent heart attacks and strokes (including for glycaemic control); (2) the availability of generic essential NCD medicines and basic technologies in public and private facilities; (3) access to palliative care; and (4) vaccination against human papillomavirus and hepatitis B virus as infectious causes of cancer". However, in addition, they called for routine facility-based monitoring of medicine prices, quality and efficiency of use, as

well as for attention to the extent of out-of-pocket expenditure for NCD medicines. Further, they argued that such questions should be added to routine household surveys.

Although based on 2008 data, the systematic analysis of global cancer burden, expressed in DALY terms, has provided important insights.²⁰⁸ In 2008, an estimated 169.3 million healthy life-years were lost because of cancer in 2008, with 65% to the total burden due to lung, liver, breast, stomach, colorectal, cervical, and oesophageal cancers, and leukaemia. It has also been shown that societal and economic transitions are associated with shifts in the relative burden of different types of cancer.²⁰⁹ As reductions in the burden of infection-related cancers are seen, increases in cancers associated with reproductive, dietary and hormonal factors are experienced. In South Africa, increased access to ART was shown to reduce both the incidence and progression of cervical lesions among women living with HIV.²¹⁰ Access to human papilloma virus vaccines will be a major determinant of cervical cancer rates in developing countries, but access to quality screening, diagnostic and care systems are also vital.²¹¹

Steps are being taken to revitalise the South African National Cancer Registry. While welcoming this development, staff involved in the South African Paediatric Tumour Registry have argued that this repository be maintained, in parallel, with a specific focus on paediatric data.²¹² In January 2013, a Ministerial Advisory Committee on the Prevention and Control of Cancer was appointed.

Although NCDs such as cardiovascular disease have traditionally been depicted as due to 'lifestyle' choices, it has also been recognised that urban life poses many challenges which limit the options open to those who live in such settings. In its report entitled "Urbanization and cardiovascular disease: Raising heart-healthy children in today's cities", the World Heart Federation has called for a life-course approach, from conception through the end of life, to address urban health risks.²¹³

c <http://www.thelancet.com/series/non-communicable-diseases>

Table 20: Chronic disease indicators by province

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Cervical cancer screening coverage											
2008 DHIS	30.1	38.9	46.1	51.1	52.5	40.9	30.1	51.7	52.9	45.6	a
2009 DHIS	34.0	40.3	45.6	47.0	63.9	52.2	35.1	47.0	57.9	47.6	a
2010 DHIS	36.2	38.1	51.4	58.2	55.9	60.2	37.9	48.4	65.8	52.2	a
2011 DHIS	37.8	44.2	44.9	77.1	60.1	59.3	32.4	48.8	64.4	55.0	a
Hypertension prevalence (per 1 000)											
2008 NiDS female 15+	-	-	-	-	-	-	-	-	-	358	b
2008 NiDS female 15-24	-	-	-	-	-	-	-	-	-	106	b
2008 NiDS female 25+	-	-	-	-	-	-	-	-	-	453	b
2008 NiDS female 25-34	-	-	-	-	-	-	-	-	-	189	b
2008 NiDS female 35-44	-	-	-	-	-	-	-	-	-	416	b
2008 NiDS female 45-54	-	-	-	-	-	-	-	-	-	604	b
2008 NiDS female 55-64	-	-	-	-	-	-	-	-	-	694	b
2008 NiDS female 65+	-	-	-	-	-	-	-	-	-	789	b
2008 NiDS male 15+	-	-	-	-	-	-	-	-	-	339	b
2008 NiDS male 15-24	-	-	-	-	-	-	-	-	-	130	b
2008 NiDS male 25+	-	-	-	-	-	-	-	-	-	408	b
2008 NiDS male 25-34	-	-	-	-	-	-	-	-	-	237	b
2008 NiDS male 35-44	-	-	-	-	-	-	-	-	-	340	b
2008 NiDS male 45-54	-	-	-	-	-	-	-	-	-	524	b
2008 NiDS male 55-64	-	-	-	-	-	-	-	-	-	647	b
2008 NiDS male 65+	-	-	-	-	-	-	-	-	-	717	b
2008 NiDS total 25+	-	-	-	-	-	-	-	-	-	434	b
2010 NiDS female 15+	-	-	-	-	-	-	-	-	-	336	c
2010 NiDS female 15-24	-	-	-	-	-	-	-	-	-	93	c
2010 NiDS female 25+	-	-	-	-	-	-	-	-	-	426	c
2010 NiDS female 25-34	-	-	-	-	-	-	-	-	-	189	c
2010 NiDS female 35-44	-	-	-	-	-	-	-	-	-	350	c
2010 NiDS female 45-54	-	-	-	-	-	-	-	-	-	545	c
2010 NiDS female 55-64	-	-	-	-	-	-	-	-	-	708	c
2010 NiDS female 65+	-	-	-	-	-	-	-	-	-	775	c
2010 NiDS male 15+	-	-	-	-	-	-	-	-	-	321	c
2010 NiDS male 15-24	-	-	-	-	-	-	-	-	-	136	c
2010 NiDS male 25+	-	-	-	-	-	-	-	-	-	381	c
2010 NiDS male 25-34	-	-	-	-	-	-	-	-	-	239	c
2010 NiDS male 35-44	-	-	-	-	-	-	-	-	-	331	c
2010 NiDS male 45-54	-	-	-	-	-	-	-	-	-	441	c
2010 NiDS male 55-64	-	-	-	-	-	-	-	-	-	591	c
2010 NiDS male 65+	-	-	-	-	-	-	-	-	-	710	c
2010 NiDS total 25+	-	-	-	-	-	-	-	-	-	406	c

Reference notes (indicator definitions from page 310 and references from page 315):

- a DHIS. Data extracted June 2012. Data for financial year from April of the year to March of the following year (not calendar year).
- b AHS 2012.⁶⁷ Calculated from the NiDS Wave 1 dataset.²¹⁴ The measured prevalence of hypertension was defined as those with BP equal or above 140/90 mmHg and/or taking anti-hypertensive medication. Figures converted from % to per 1 000.
- c AHS 2012.⁶⁷ Calculated from the NiDS Wave 2 dataset.²¹⁵ The measured prevalence of hypertension was defined as those with BP equal or above 140/90 mmHg and/or taking anti-hypertensive medication. Figures converted from % to per 1 000.

Behaviour and awareness

Context	There is intense interest in behaviours that are correlated with non-communicable disease risk, such as smoking and alcohol use.
New data sources	Nationally, new data have been reported in the: <ul style="list-style-type: none"> • SACENDU – South African Community Epidemiology Network on Drug Use Internationally, reports of interest include: <ul style="list-style-type: none"> • WHO Global Information System on Alcohol and Health (GISAH) • WHO Mortality Attributable to Tobacco (2012) • WHO Atlas of Substance Abuse Disorders (Country profile: South Africa)
Key issues and trends	While South Africa has made significant progress in reducing tobacco use, it has had less success in curbing high-risk use of alcohol. Systems to track substance abuse remain poorly developed.

There are extensive data on a range of alcohol-related health indicators maintained by the WHO Global Information System on Alcohol and Health (GISAH).^d These data cover levels and patterns of consumption, harms and consequences, data on economic aspects, alcohol control policies, and prevention and research resources. Although the current South African data appear to be from surveys already captured in previous editions of the Review, this will be an interesting resource to watch in future. Locally, a review of available data, dating from 1998 to 2008, from the South Africa Demographic and Health Survey and the Youth Risk Behaviour Survey was published in 2012.²¹⁶ It identified early age of initiation of alcohol consumption and binge drinking, particularly among females, as problematic. A survey among 1 600 high school adolescents in Limpopo sought to identify the factors that accounted for consumption of home-brewed alcohol.²¹⁷ It found that adolescents' perceptions of high levels of adult anti-social behaviour and crime and violence in the community were significant risks for early alcohol initiation.

The first wave of the Global Adult Tobacco Survey was reported in 2012.²¹⁸ The data to date cover 16 low- and middle-income countries, but not South Africa. An analysis of socio-economic inequalities in smoking did include South African data, but from the World Health Survey 2002-2004.²¹⁹ Understanding the particular consumption pattern in a country could help to target control efforts. A recent WHO publication on mortality attributable to tobacco use points out that tobacco kills more than tuberculosis, HIV, and malaria combined.²²⁰ The attributable death toll from tobacco is about 5 million people per year, with an additional 600 000 from second-hand smoke. The data presented for South Africa were based on the smoking impact ratio (SIR) method, which uses the number of lung cancer deaths by sex and age as the starting point to estimate tobacco-attributable deaths for a particular year. Okeke et al. argued that although the smoking rate in healthcare workers in three KwaZulu-Natal hospitals was lower than the national average, this nonetheless undermined their role in assisting patients to stop smoking, tends to be correlated with alcohol use problems, and exposes others to second-hand smoke.²²¹

As indicated in the section on non-communicable diseases, one of the potential global targets is a reduction in adult inactivity levels. A series of articles in the Lancet has drawn attention to available data on global physical activity levels,²²² correlates of physical activity,²²³ the estimated impact of physical inactivity on the burden of major NCDs,²²⁴ the potential implications of trends in information

and communications technology (ICT) and transportation on levels of physical activity,²²⁵ and the need for global action.²²⁶ The accompanying editorial points out that the estimates of mortality due to inactivity (5.3 million of the 57 million deaths that occurred worldwide in 2008) rank this contributory cause on the same level as tobacco.²²⁷

As in previous years, data on the extent of substance abuse is limited to that produced by the South African Epidemiology Network on Drug Abuse (SACENDU).^{228,229} A summary of the available data from July 1996 to December 2011 was published in mid-2012.²³⁰ Data from this alcohol and other drug sentinel surveillance system are gathered from specialist treatment programmes in all nine provinces, but are reported provincially for the Western Cape, KwaZulu-Natal, Eastern Cape and Gauteng, and then for what is termed the Northern Region (combining data from Mpumalanga and Limpopo) and the Central Region (Free State, Northern Cape and North West). Data are reported every six months. However, the number of sentinel sites in each area may be very limited. In the most recent reporting period (July to December 2011), data were contributed by a total of 8 291 admissions to 59 centres/programmes across all provinces. Alcohol was the most common primary substance of abuse in most of these sites, and cannabis the most common illicit drug used. A decline in admissions for methamphetamine was noted in the Western Cape, but heroin use was increasing, across all sites. Cocaine use was stable across most sites, but notably higher in Gauteng. Methcathinone use was also increasing in Gauteng. Prescription or over-the-counter medicines were still commonly reported as secondary substances of abuse.

d <http://apps.who.int/ghodata/?theme=GISAH>

Table 21: Behaviour and awareness indicators by province

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Alcohol dependence (%)											
2010 HCWs	-	-	-	22.4	-	-	-	-	-	-	a
Ever smoked cigarettes (%)											
2010 HCWs	-	-	-	18.1	-	-	-	-	-	-	b
2010 HCWs female	-	-	-	6.9	-	-	-	-	-	-	b
2010 HCWs male	-	-	-	43.1	-	-	-	-	-	-	b
Number of admissions for alcohol and other drug abuse											
2009 Jul-Dec	648	-	2 646	1 138	-	-	-	-	2 642	8 217	c
2010 Jul-Dec	707	-	2 884	669	-	-	-	-	2 933	8 407	d
2011 Jul-Dec	721	-	2 786	610	-	-	-	-	2 733	8 291	e
Prevalence of smoking (%)											
2010 Allied HCWs	-	-	-	16.0	-	-	-	-	-	-	f
2010 Doctors	-	-	-	11.7	-	-	-	-	-	-	b
2010 HCWs female	-	-	-	2.4	-	-	-	-	-	-	b
2010 HCWs male	-	-	-	30.3	-	-	-	-	-	-	b
2010 HCWs total	-	-	-	11.1	-	-	-	-	-	-	b
2010 Nurses	-	-	-	8.0	-	-	-	-	-	-	b
2010 Other	-	-	-	27.3	-	-	-	-	-	-	g
2010 Student nurses	-	-	-	7.5	-	-	-	-	-	-	b
Primary drug of abuse as % of all drugs of abuse											
2009 alcohol	50.0	-	47.0	47.0	-	-	-	-	29.0	-	h
2009 cannabis	16.0	-	28.0	28.0	-	-	-	-	17.0	-	h
2009 cocaine	7.0	-	5.0	6.0	-	-	-	-	2.0	-	h
2009 heroin	4.0	-	12.0	17.0	-	-	-	-	12.0	-	h
2009 mandrax	6.0	-	2.0	1.0	-	-	-	-	3.0	-	h
2009 methamphetamine	7.0	-	1.0	0.1	-	-	-	-	36.0	-	h
2010 alcohol	44.0	-	41.0	55.0	-	-	-	-	28.0	-	i
2010 cannabis	18.0	-	28.0	26.0	-	-	-	-	18.0	-	i
2010 cocaine	7.0	-	6.0	6.0	-	-	-	-	2.0	-	i
2010 heroin	5.0	-	12.0	9.0	-	-	-	-	12.0	-	j
2010 mandrax	6.0	-	2.0	2.0	-	-	-	-	3.0	-	i
2010 methamphetamine	9.0	-	1.0	1.0	-	-	-	-	35.0	-	i
2011 alcohol	40.4	-	35.9	67.0	-	-	-	-	23.7	-	k
2011 cannabis	16.1	-	27.6	16.2	-	-	-	-	14.5	-	k
2011 cocaine	4.0	-	6.2	5.4	-	-	-	-	2.2	-	k
2011 heroin	2.6	-	12.7	6.1	-	-	-	-	17.0	-	k
2011 mandrax	5.0	-	1.7	2.5	-	-	-	-	2.4	-	k
2011 methamphetamine	18.4	-	1.4	0.5	-	-	-	-	38.8	-	k

Reference notes (indicator definitions from page 310 and references from page 315):

- a Okeke et al. 2012.²²¹ Presence of alcohol use problems assessed using CAGE questionnaire - 'yes' answer to two or more CAGE questions. The study was conducted among health care workers (HCWs) in three public hospitals in a health district in KwaZulu-Natal.
- b Okeke et al. 2012.²²¹ The study was conducted among health care workers (HCWs) in three public hospitals in a health district in KwaZulu-Natal.
- c SACENDU. Update June 2010.²³¹ Data for Jul-Dec 2009. The total figure includes patients from MP and LP (Northern Region) and from FS, NW and NC combined (Central Region).
- d SACENDU. Update June 2011.²³² Data for Jul - Dec 2010 (Phase 29). The total figure includes patients from MP and LP (Northern Region) and from FS, NW and NC combined (Central Region).
- e SACENDU. Update June 2012.²²⁸ Data for Jul - Dec 2011 (Phase 31). The total figure includes patients from MP and LP (Northern Region) and from FS, NW and NC combined (Central Region).
- f Okeke et al. 2012.²²¹ Included: paramedics, lay counsellors, clinical orderlies, pharmacists, pharmacy assistants, laboratory technologists, laboratory technicians, radiographers, and social workers.
- g Okeke et al. 2012.²²¹ Clerks and data capturers.
- h SACENDU. Update June 2010.²³¹ Data for Jul-Dec 2009.
- i SACENDU. Update June 2011.²³² Data for Jul - Dec 2010 (Phase 29).
- j The decline in KZN since 2nd half of 2009 was mainly due to data not being included from a centre which primarily deals with the use of 'Sugars' (a low-quality heroin and cocaine mix) among young, Indian males in South Durban; and in this period no data were supplied by this centre.
- k SACENDU. Update June 2012.²²⁸ Data for Jul - Dec 2011 (Phase 31). Note grouped results for MP and LP (Northern Region) and from FS, NW and NC combined (Central Region).

Injuries

Context	Morbidity and mortality associated with violence and injuries are responsible for part of what has been termed the 'quadruple' burden of disease in South Africa.
New data sources	Nationally, new data have been reported in the: <ul style="list-style-type: none"> • StatsSA Victims of crime survey (VOCS) 2012 • The National Injury Mortality Surveillance System (NIMSS) Gauteng and Mpumalanga profiles 2010
Key issues and trends	Road traffic accidents have received intense media coverage over the 2012/13 festive season, highlighting the impotence of current interventions. One proposed way forward is the introduction of a graduated driving licence system. No complete annual statistics on road accident fatalities appear to have been made available by the Road Traffic Management Corporation (RTMC) since December 2010.

StatsSA plans to repeat the Victims of Crime Survey (VOCS) annually from 2011; the 2012 survey²³³ was only the fifth in a series that was first conducted in 1998. Subsequent surveys were conducted in 2003, 2007 and 2011. The 2012 survey was, however, the largest of the series, based on data gathered from the residents of 31 007 dwelling units. The dwelling units targeted included private households in all nine provinces, as well as workers' hostels. However, it did not cover those in other collective living quarters such as students' hostels, old-age homes, hospitals, prisons and military barracks. It was therefore only representative of the non-institutionalised and non-military persons or households in South Africa. However, because of their sensitivity, assaults and sexual offences were likely to be under-reported in this type of household survey. While most households (77.7%) would seek medical care for a victim of crime at a hospital or trauma unit, 72.0% responded that they would seek care at a local clinic, and 32% mentioned approaching a police station. Approximately 32% reported that they would seek care from a private medical practitioner. Only 3.4% would take a victim of crime to a traditional leader or traditional authority.

The National Injury Mortality Surveillance System (NIMSS), established in 1999 to provide more comprehensive information about deaths due to external causes from medico legal laboratories and state forensic chemistry laboratories, is a useful source of data for public health purposes. Unfortunately there has been no national report since 2008. Observations from the 2010 Gauteng report were that violence was the leading manner of death, accounting for just under one-third (31.0%) of the 11 084 non-natural deaths, followed by transport (28.3%), suicide (11.4%), and unintentional, non-transport injury (10.5%).²³⁴ For the remaining 2 081 (18.8%) cases, the manner of death was undetermined. For Mpumalanga in 2010 the following breakdown was recorded: transport-related injuries were the leading manner of death, accounting for almost half (46.2%) of the 3 855 non-natural deaths, followed by violence (21.5%), other unintentional injuries (12.7%), and suicide (12.6%).²³⁵ For the remaining 271 (7.0%) cases, the manner of death was undetermined. These provincial reports also presented age-standardised mortality rates per cause of death and compared results to other sources. For instance, the Gauteng report noted that "[v]iolence-related death rates are markedly higher than the 38.6, 37.3 and 34.1 deaths per 100 000 population reported by the SAPS crime statistics for South Africa for the three years [2008-2010]", and "[r]oad traffic death rates were also higher than the global rate of 20.8 per 100 000 and continental rate of 26.3 per 100 000". The Mpumalanga report recorded a road traffic death rate of 56.3 per 100 000 (substantially higher than the national

estimate of 39.7 per 100 000 population) and noted that "[a]lcohol was identified as a notable risk for transport-, violence- and suicide-related deaths. More than half the transport-related cases that were screened tested positive, with passenger injury cases showing the highest alcohol-relatedness whilst pedestrian injury cases showed the highest average levels of consumption".

As part of the effort to identify 'best-buys' in relation to NCDs, the cost-effectiveness of strategies to combat road traffic accidents were also modelled for sub-Saharan Africa and South East Asia.²³⁶ The most cost-effective approach appeared to be enforcement of road safety laws. In this regard, the claim expressed in the VOCS that more than half of those who were victims of corruption were asked to pay a bribe to the traffic official to avoid traffic fines is of particular concern. A study in which age-specific driver mortality rates were calculated from Western Cape mortuary data for 2008 showed the highest mortality in the youngest age group (15 to 19 years),²³⁷ supporting calls for a graduated driving licence system. In such a system, novice drivers progress through a three-phase sets of licences, from the learner's to a provisional and then a full driver's licence.

Data from relatively small-scale localised research studies are difficult to extrapolate to the national level. Recent examples of relevance to this section include an analysis of trends in childhood poisoning cases at Red Cross War memorial Children's Hospital,²³⁸ a falls prevalence study among elderly residents of three Cape Town suburbs,²³⁹ and an analysis of trauma workload at King Edward VIII Hospital, Durban.²⁴⁰ A trauma surveillance tool has been piloted at primary healthcare emergency centres in Elsies River, Western Cape.²⁴¹ Although this was a very brief pilot, over only 10 days, at just one facility, it highlighted the major challenges with data quality that face all such efforts.

Attention has been drawn to the high incidence of lightning and thunderstorm activity in some parts of the country, and the associated lightning mortality data.²⁴² It was estimated that the incidence of lightning-related fatalities was far higher in South Africa (1.5 to 8.8 per million inhabitants per year) than in the United States (0.3 to 2.0 per million inhabitants per year). Up to 100 lightning-related fatalities are recorded in South Africa per year, and it is believed that there are 4 to 5 times as many survivors of lightning strikes who seek medical care. A Lightning Interest Group for Health Technology and Science (LIGHTS) has been established at the University of the Witwatersrand.

Table 22: Injury indicators by province

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Road accident fatalities per 100 000 population											
2008	22.2	31.4	24.2	25.3	25.8	52.1	31.2	37.0	30.2	28.4	a
2009	22.9	34.4	22.6	27.1	27.8	46.7	30.7	35.6	25.0	27.8	a
2010	26.5	41.4	19.5	26.2	28.1	44.0	40.1	36.2	25.3	27.9	b

Reference notes (indicator definitions from page 310 and references from page 315):

- a Road Accidents 2009.²⁴³ Ratios updated in 2010 using new StatsSA mid-year population time series estimates.
- b Road Accidents 2010.²⁴⁴

Health services indicators

Health facilities

Context	There is continued pressure on the public sector to upgrade health facilities in order to be able to eventually compete with the private sector for contracts from the National Health Insurance system. In this regard, the results of the national audit of all fixed public sector facilities have not yet been released. The Bill which provides for the establishment of an independent Office of Health Standards Compliance is still under consideration by Parliament.
New data sources	Nationally, new data have been reported in the: <ul style="list-style-type: none"> • Hospitals Direct Database of private hospitals • StatsSA General Household Survey 2011 • District Health Information System (DHIS)
Key issues and trends	Estimated health service utilisation rates have been provided in a publication by Alaba and McIntyre, based on the South African Consortium for Benefit Incidence Analysis (SACBIA) survey in 2008. However, the authors have pointed out that these data were based on a sample of only 4 800 households and that highly disaggregated data may not be stable.

Each year the StatsSA General Household Survey (GHS) includes questions about health service utilisation.³⁷ The 2011 survey reported that, when members of the household fall ill or have accidents, 70.7% would seek care from a public sector clinic or hospital, while 24.3% would consult a private medical practitioner. As in recent years, the least favoured options were private sector pharmacies (0.3%) and traditional healers (0.1%). Almost all (89.8% of all households) reported that they would use the nearest facility of its kind. Reasons for not doing so included that the waiting period at the nearest facility was too long (16.0%), medicines that were needed were not available (11.1%) and the staff were rude/uncaring or turned the patient away (3.5%). Levels of satisfaction with the health facilities used were also reported. The Health Economics Unit at the University of Cape Town has also explored community preferences for improving public sector health services, by conducting discrete choice experiments with approximately 500 households in each of two provinces (four districts in the Eastern Cape and three in the Western Cape).²⁴⁵ This study showed that communities tolerated poor quality characteristics such as long waiting times, poor staff attitudes and a lack of direct access to medical practitioners, provided they received a thorough examination, a clear explanation of their diagnosis and treatment and the medicines they needed.

Health service utilisation rates are a critical input variable for health systems planning. In this regard, an important analysis of the data from the StatsSA GHS and the South African Consortium for Benefit Incidence Analysis (SACBIA) survey has pointed to the need to improve the design of the routine household survey, in order to allow for more accurate estimation of utilisation rates.²⁴⁶ Questions which have as their starting point whether or not a member of the household was ill in the month prior to the survey can be misleading. Comparing the GHS 2008 data with the SACBIA results (also collected in 2008), Alaba and McIntyre showed that whereas similar percentages reported an illness (14% and 18% respectively), 38% of those who reported using a health service in the SACBIA survey did not report being ill in that month. The SACBIA survey also captured multiple visits in the same month. The difference in utilisation rates based on the two surveys is striking – 1.36 outpatient visits per person per year based on the GHS data, compared with 4.24 based on the SACBIA data. Using the SACBIA dataset, the authors presented age-sex standardised

utilisation of outpatient services (expressed as the average number of visits per person per year) and inpatient services (expressed as the average number of admissions per 1 000 population per year), by province, by type of area (formal urban, informal urban and rural), by ethnic group, by socio-economic group, and by medical scheme membership status, in public and private facilities. Data for the public sector were presented for clinics, district hospitals, and provincial/central hospitals. In the private sector, utilisation rates were presented for private hospitals, general practitioners, pharmacists, specialists and dentists. However, noting the relatively small sample size (4 800 households), the authors warned that the highly disaggregated data might not be as stable as that at more aggregated levels (such as for the public versus private sectors as a whole). The authors noted that the SACBIA survey was ‘a once-off initiative’ and that it was “unlikely to be feasible to undertake such a survey on a regular basis”. Accordingly, the authors emphasised that “[w]ith relatively few changes and little additional data collection effort, the GHS could allow for routine monitoring of progress with the NHI reforms from a service utilisation perspective”.

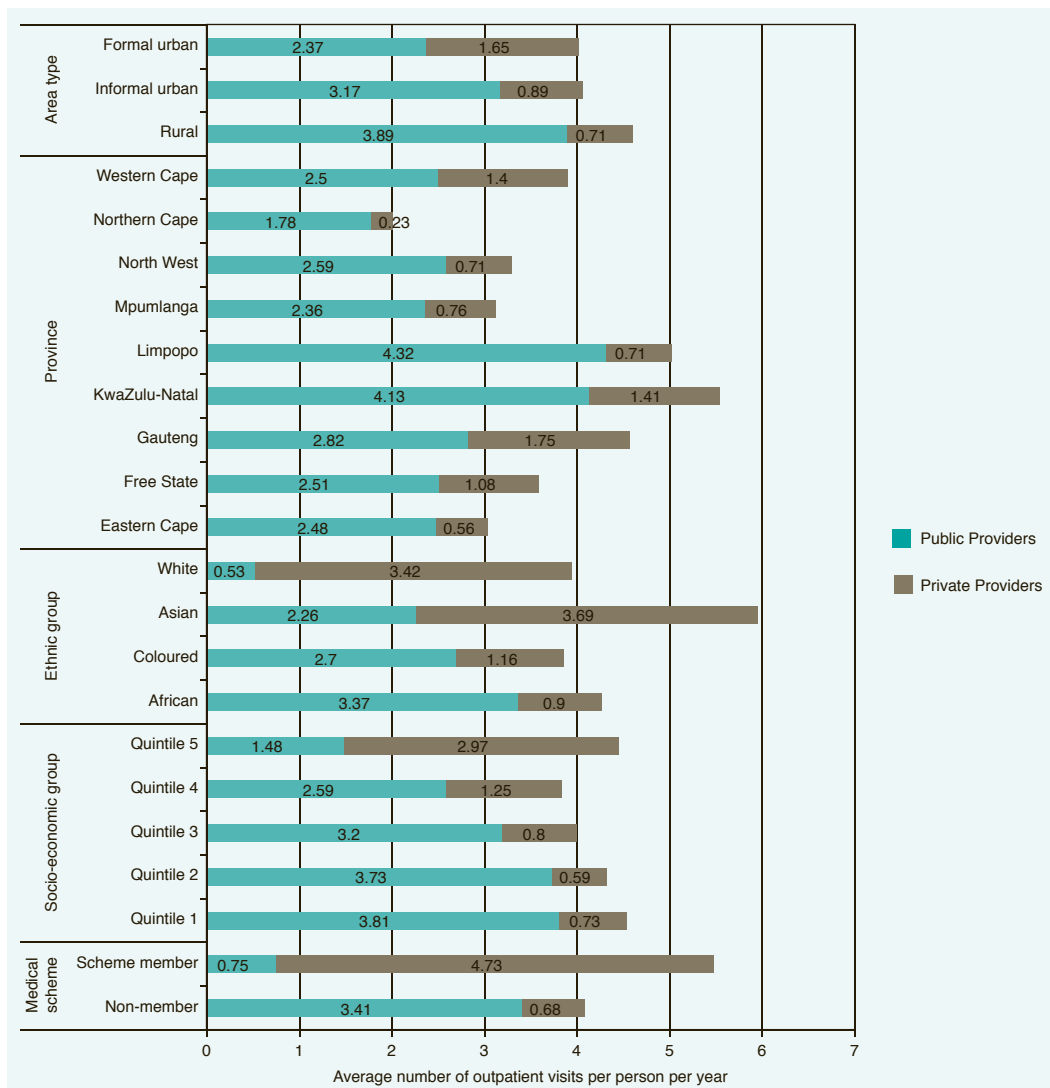
Table 23: Percentage distribution of utilisation of public and private providers, GHS and SACBIA surveys, 2008

	GHS 2008		SACBIA	
	Public	Private	Public	Private
Socio-economic status				
Quintile 1 (poorest)	81	19	87	13
Quintile 2	74	26	83	17
Quintile 3	69	31	78	22
Quintile 4	43	57	65	35
Quintile 5 (richest)	29	71	28	72
Ethnic group				
African	68	32	77	23
Coloured	58	42	67	33
Asian	40	60	37	63
White	16	84	20	80
Medical scheme membership				
Not a medical scheme member	74	26	81	19
Medical scheme member	12	88	11	89
Province				
Eastern Cape	67	33	80	20
Free State	54	46	66	34
Gauteng	50	50	57	43
KwaZulu-Natal	73	27	72	28
Limpopo	73	27	84	16
Mpumalanga	60	40	73	27
North West	63	37	78	22
Northern Cape	67	33	88	12
Western Cape	52	48	61	39

Source: Alaba and McIntyre, 2012.²⁴⁶ Based on data from the StatsSA General Household Survey (GHS) 2008 and the South Africa Consortium for Benefit Incidence Analysis survey (SACBIA) 2008.

Note: While the GHS 2008 survey indicated that 61% of those who had used an outpatient service due to illness in the previous month had used a public provider, the SACBIA survey indicated that 71% of health service visits in the past month had been to a public provider. To calculate these estimates, the denominator used for the GHS was the total number reporting service use (as only one visit was recorded per person). In the case of the SACBIA study, as multiple visits by the same person were recorded, the denominator is the total number of visits reported.

Figure 3: Age-sex standardised utilisation of outpatient services by type of area, province, ethnic group, socio-economic group and medical scheme membership status, SACBIA, 2008



Source: Alaba and McIntyre, 2012.²⁴⁶ Based on data from the StatsSA General Household Survey (GHS) 2008 and the South Africa Consortium for Benefit Incidence Analysis survey (SACBIA) 2008.

Note: Data were age-sex standardised and adjusted for seasonality.

Table 24: Health services indicators by province

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Percentage of users of private health services highly satisfied with the service received											
2009 GHS	95.1	92.4	91.2	94.7	92.2	87.8	95.6	94.2	92.5	92.5	a
2010 GHS	95.1	91.0	91.2	88.5	96.1	91.3	90.8	92.7	94.9	92.1	a
2011 GHS	98.6	95.3	92.4	85.9	97.2	94.8	89.9	89.9	92.0	92.9	a
Percentage of users of public health services highly satisfied with the service received											
2009 GHS	56.0	41.8	52.9	53.7	67.4	46.8	65.8	44.8	58.1	54.5	a
2010 GHS	52.7	55.8	52.4	48.9	75.4	57.4	64.1	50.5	60.4	55.9	a
2011 GHS	67.0	68.4	57.6	51.5	78.1	62.2	54.5	52.0	65.6	61.9	a

Reference notes (indicator definitions from page 310 and references from page 315):

a StatsSA GHS 2011.³⁷ Reporting results from the GHS 2009, 2010 and 2011.

Table 25: Health facilities indicators by province

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Average length of stay (ALOS)											
2009 DHIS	6.7	4.9	5.2	6.9	5.7	4.7	3.4	5.4	4.6	5.6	a
2010 DHIS	6.7	4.9	5.1	6.9	5.5	4.7	3.3	5.7	5.3	5.7	a
2011 DHIS	6.7	4.9	4.9	6.7	5.7	4.5	3.2	5.5	5.3	5.6	a
Number of beds											
2010 Private sector	1 723	2 337	14 278	4 514	600	1 252	293	1 685	4 385	31 067	b
2011 District Hospitals	6 214	1 539	2 424	8 522	4 057	2 719	528	1 528	2 477	30 007	c
2011 National Central Hospitals	0	616	6 170	834	0	0	0	0	2 541	10 160	c
2011 Provincial Tertiary	3 770	0	0	493	952	630	638	0	0	6 484	c
2011 Regional Hospitals	585	1 813	6 346	7 291	1 581	877	145	1 881	1 355	21 873	c
Number of health facilities											
2010 Private hosp total	15	16	84	33	8	9	3	14	34	216	b
2011 District Hospitals	65	25	12	39	31	23	16	16	32	259	d
2011 National Central Hospitals	-	1	4	1	-	-	-	-	3	9	d
2011 Provincial Tertiary	7	-	-	1	2	2	-	-	-	12	d
2011 Public hosp total	91	33	37	76	42	33	20	23	55	410	d
2011 Regional Hospitals	2	5	11	14	5	3	1	4	8	53	d
2011 Specialised Hospitals	17	2	10	21	4	5	3	3	12	77	d
2012 CHC/CDC	33	6	31	16	23	47	26	49	51	282	e
2012 District Hospitals	65	25	10	39	30	22	14	15	34	254	e
2012 National Central Hospitals	0	0	3	1	0	0	0	0	2	6	e
2012 Provincial Tertiary	2	1	1	1	2	2	-	1	-	10	e
2012 Public clinics	719	214	321	556	436	233	128	256	212	3 075	e
2012 Regional Hospitals	6	5	12	13	5	3	2	4	5	55	e
2012 Specialised Hospitals	18	1	6	18	4	5	1	2	13	68	e
Useable bed utilisation (occupancy) rate (BUR)											
2009 DHIS	71	71	76	68	69	64	52	68	81	71	a
2010 DHIS	71	69	73	65	68	66	59	70	80	70	a
2011 DHIS	71	72	74	70	72	70	59	71	82	73	a
Useable beds per 1 000 population											
2009 District Hospitals	1.0	0.6	0.3	0.9	0.8	0.9	0.8	0.4	0.5	0.7	f
2009 Public sector	2.5	2.1	2.2	2.5	1.6	1.7	2.0	1.5	2.5	2.2	g
2009 Regional Hospitals	0.1	0.7	0.8	0.8	0.3	0.3	0.7	0.6	0.6	0.6	h
2009 Total population	-	-	-	-	-	-	-	-	-	2.5	i
2010 Private sector	2.1	4.9	4.8	2.7	1.3	2.4	2.0	3.6	3.4	3.5	j
2011 District Hospitals	1.1	0.6	0.3	1.0	0.8	0.9	0.8	0.5	0.5	0.7	f
2011 Public sector	2.3	2.0	2.1	2.7	1.6	1.5	1.5	1.5	2.2	2.1	g
2011 Regional Hospitals	0.1	0.7	0.8	1.0	0.3	0.3	0.6	0.6	0.6	0.6	h
2011 Total population	2.3	2.4	2.8	2.4	1.6	1.5	1.4	1.9	2.4	2.3	k
Utilisation rate PHC											
2009 DHIS	2.8	2.3	1.7	2.5	2.9	2.2	2.9	2.5	2.9	2.4	a
2010 DHIS	2.7	2.3	1.8	2.5	2.7	2.2	3.0	2.4	2.9	2.4	a
2011 DHIS	2.7	2.5	2.0	2.8	2.8	2.4	2.9	2.3	2.8	2.5	a
Utilisation rate PHC <5 years											
2009 DHIS	4.6	3.7	3.9	4.5	6.3	4.8	4.5	4.7	4.9	4.6	a
2010 DHIS	4.3	3.5	3.9	4.4	5.9	4.8	4.7	4.5	4.7	4.5	a
2011 DHIS	4.6	3.7	4.1	4.6	6.2	4.8	4.6	4.4	4.7	4.7	a

Reference notes (indicator definitions from page 310 and references from page 315):

- a DHIS. All facility types. Data extracted June 2012. Data for financial year from April of the year to March of the following year (not calendar year).
- b Hospitals Direct Database.²⁴⁷
- c DHIS. Extracted June 2012. Average number of beds for 2011/12 financial year.
- d DHIS. Extracted June 2011. Total includes District, Regional, Provincial Tertiary, National Central and Specialised Hospitals.
- e AHS 2012.⁶⁷ Based on National Facilities Audit. Note that a number of facilities received updated classifications compared to their current OrgUnitType in DHIS, therefore the numbers may vary, but this is not necessary due to a real change in the number of physical facilities on the ground. DHIS also has some units within facilities as separate orgunits.

- f DHIS. Calculated from DHIS useable beds for district hospitals, per 1 000 uninsured population (calculated from StatsSA GHS medical schemes coverage and mid-year population estimates).
- g DHIS. Calculated from DHIS useable beds for all types of public sector hospitals, per 1 000 uninsured population (calculated from StatsSA GHS medical schemes coverage and mid-year population estimates).
- h DHIS. Calculated from DHIS useable beds for regional hospitals, per 1 000 uninsured population (calculated from StatsSA GHS medical schemes coverage and mid-year population estimates).
- i Econex Health Reform Note 4.²⁴⁸
- j Hospitals Direct Database.²⁴⁷ Calculated from Wilbury & Claymore data on beds, per 1 000 population with medical scheme cover from StatsSA GHS.
- k AHS 2012.⁶⁷ Calculated from Wilbury & Claymore data on private hospitals (2010/11) and DHIS data on main public hospital types (district, regional, provincial, central, specialised psychiatric and TB hospitals) per total population (DHIS population estimates).

Health personnel

Context	Human Resources are the single most expensive component of healthcare delivery costs and are key to enabling countries to meet their health systems objectives. A third version of the Human Resources for Health Strategy for the Health Sector: 2012/13-2016/17 document was released in January 2012.
New data sources	Nationally, new data have been reported in the: <ul style="list-style-type: none"> • PERSAL 2011 • NDoH data on community service professionals • Data from the various health professions councils • Human Resources for Health Strategy for the Health Sector: 2012/13 - 2016/17 (version 3)
Key issues and trends	Data on only selected categories of health professionals are provided in this chapter and the online database. However, exclusion of some categories should not be taken to imply that the data do not exist and users are encouraged to consult the original sources if further details or breakdowns are required. Some sources may also have more detail on age and gender breakdowns which are not included here for space reasons.

The total number of health professionals potentially available to work in the health system is assumed to be as recorded in the registers of the various health professions councils, such as the Health Professions Council of South Africa (HPCSA), the South African Nursing Council (SANC) and the South African Pharmacy Council (SAPC). However these registers include professionals who are retired, abroad, working part-time, working in other sectors or not working at all. In general the registers do not have reliable information on how many people fall into these categories, or on the proportion working in the public or private sectors, or on the distribution working part-time or across sectors. Other areas that have been poorly documented are the number and distribution of community health workers, allied health professionals and traditional healers. PERSAL includes information on all public sector health workers, and data on the number of filled posts for a selection of health professionals is included in this chapter by province (Table 26) and ethnic group (Table 28). Data on vacant posts are no longer supplied as this only really reflects vacancies relative to the staff establishment on the system, which has not been created with reference to any agreed norm or standard of required health professionals, and may therefore be misleading. The Human Resources for Health Strategy for the Health Sector: 2012/13-2016/17 (version 3) stated that the ‘gap’ between existing personnel and those required that was presented should be considered only as “the beginning of a process of forecast modelling” and that further refinement of the model would be performed in 2012.²⁴⁹ The South African health system is far from unique, though, in lacking a well-designed and effective human resources for health information system.²⁵⁰

In the *South African Health Review*, indicators of human resources distribution per population have been calculated using the estimated population dependent on each sector (i.e. public sector personnel per uninsured population vs. private sector personnel per medical scheme beneficiaries). While this approach was used at least once in the Human Resources for Health Strategy document (depicting public sector personnel growth in absolute numbers and per 10 000 uninsured population between 2002 and 2010), this document also showed health professional numbers per sector per 10 000 total population. In order to obtain these figures, a series of assumptions were used to make adjustments to the data. For instance, in order to “correct for people working in both sectors and thus avoid double counting, 5% was subtracted from both the PERSAL and HPCSA figures for specialists and 2.5% for all other

categories”. In addition, in the HPCSA data, “professionals who either failed to indicate their location or indicated this as ‘foreign’ were excluded from the counts, to allow for those professionals who are practising abroad, but still registered in South Africa”. Further it was assumed that 18% of nurses were registered but not actively working in South Africa, and that 41.4% of nurses worked in the private sector. Care should therefore be exercised when comparing any of the data presented in the Human Resources for Health Strategy document with those reported elsewhere and in this Review.

The plans to re-engineer the primary healthcare system require attention to three categories of health personnel, those to be incorporated into the District-based Clinical Specialist Teams (DCSTs) for the support of priority health programmes, those required to deliver school-based PHC services, and those required to deliver municipal ward based services (the Primary Health Care Agents). A report from the Ministerial Task Team on District Clinical Specialist Teams has been released.²⁵¹ There was brief mention of community health workers in the Human Resources for Health Strategy, noting the need to reach agreement on a standardised scope of work, on the competencies required, on a training and supervision package, and on terms and conditions of service. The Strategy document also highlighted the need for mid-level workers, such as pharmacist’s assistants. The first cohort of clinical associates qualified in 2011, though it is difficult to see how this cadre has been incorporated into official records systems. Doherty et al. have documented the development of the clinical associates and identified a number of priorities in this regard, including establishing sustainable funding sources for training and deployment, providing adequate supervision and support, monitoring the initial impact of the new cadre on health services, and managing the sensitivities of the medical and nursing professions around scopes of practice and post levels.²⁵² In the longer term, they have called for attention to “national leadership and support, scaling up of training, the development of career pathways, and the improvement of working conditions at district hospitals”.

Addressing inequities in human resources distribution implies the application of resource re-allocation strategies. Based on the case study of planned re-allocation of human resources within Cape Town in 2003, Scott et al. have drawn attention to the lack of trust between mid-level managers and nursing personnel and how this influenced the potential to implement an equity-promoting strategy.²⁵³

Internationally, there has been continued interest in the concept of task-shifting.²⁵⁴ There was particular interest in the results of the STRETCH programme (Streamlining Tasks and Roles to Expand Treatment and Care for HIV), which was tested in a pragmatic, parallel, cluster-randomised trial.²⁵⁵ The bottom line finding was that expanding primary-care nurses' roles to include ART initiation and re-prescription is safe, can improve health outcomes and quality of care, but might not reduce time to ART initiation or mortality.

Table 26: Number of health personnel practising by sector, and registered with applicable professional council, by province

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Number of clinical associates											
2012 Public sector	29	5	18	-	-	4	3	5	-	64	a
Number of clinical associates registered											
2010 Registered with HPCSA	-	-	5	-	-	1	-	-	-	10	b
2011 Registered with HPCSA	0	0	4	0	0	1	0	0	0	24	b
2012 Registered with HPCSA	-	2	10	-	-	1	-	-	-	93	b
Number of dental practitioners											
2010 Public sector	96	62	215	84	95	74	25	40	79	770	c
2011 Public sector	108	59	213	101	127	103	28	51	116	906	c
2012 Public sector	116	70	224	113	152	104	26	53	123	982	c
Number of dental practitioners registered											
2010 Registered with HPCSA	249	154	1 910	629	128	356	68	84	1 076	5 320	b
2011 Registered with HPCSA	232	147	1 816	605	126	338	66	81	1 019	5 409	b
2012 Registered with HPCSA	230	149	1 734	581	124	322	59	75	990	5 572	b
Number of dental specialists											
2010 Public sector	0	-	54	8	0	36	-	1	22	121	c
2011 Public sector	-	-	65	6	1	12	-	-	34	118	c
2012 Public sector	-	-	98	1	1	10	1	-	30	141	c
Number of dental therapists											
2010 Public sector	8	2	39	25	63	19	10	16	3	185	c
2011 Public sector	8	2	37	27	54	17	10	18	3	176	c
2012 Public sector	11	2	41	80	75	21	9	18	2	259	c
Number of dental therapists registered											
2010 Registered with HPCSA	7	15	132	159	38	66	7	17	3	492	b
2011 Registered with HPCSA	7	12	114	155	31	62	7	15	3	504	b
2012 Registered with HPCSA	6	10	100	141	31	55	7	18	3	536	b
Number of enrolled nurses											
2010 Public sector	2 377	435	4 975	9 232	2 732	1 414	188	774	2 188	24 316	c
2011 Public sector	2 794	653	5 534	9 634	3 860	1 556	216	740	2 268	27 256	c
2012 Public sector	3 229	755	5 675	10 800	4 344	1 634	219	746	2 332	29 735	c
Number of enrolled nurses registered											
2010 Registered with SANC	3 566	1 846	13 006	18 895	4 170	2 276	461	2 549	5 601	52 370	d
2011 Registered with SANC	3 965	1 918	13 627	19 771	4 685	2 539	450	2 691	5 762	55 408	d
2012 Registered with SANC	4 416	1 971	14 476	20 978	5 101	2 668	451	2 766	5 895	58 722	d
Number of environmental health practitioners											
2010 Public sector	128	51	111	171	156	126	11	30	9	795	c
2011 Public sector	113	51	106	182	155	125	19	33	9	794	c
2012 Public sector	112	80	132	186	159	161	23	42	5	901	c
Number of environmental health practitioners registered											
2010 Registered with HPCSA	223	138	612	501	180	258	75	56	421	2 842	b
2011 Registered with HPCSA	195	126	567	457	165	234	65	46	382	2 970	b
2012 Registered with HPCSA	191	115	535	432	167	218	60	49	345	3 215	b
Number of medical practitioners											
2010 Private sector	-	-	-	-	-	-	-	-	-	6 775	e
2010 Public sector	1 323	577	2 480	3 058	962	709	321	480	1 392	11 309	c
2011 Public sector	1 490	588	2 709	3 101	997	704	361	595	1 463	12 014	c
2012 Public sector	1 477	665	2 920	3 178	1 059	729	392	613	1 468	12 508	c

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Number of medical practitioners (including specialists) registered											
2010 Registered with HPCSA	2 149	1 559	11 524	5 670	937	1 819	403	631	7 086	36 912	b
2011 HPCSA General MPs	1 534	931	6 757	3 647	760	1 443	298	476	4 026	25 898	b
2011 HPCSA Specialist MPs	493	497	4 095	1 598	126	274	64	127	2 542	11 685	b
2011 Registered with HPCSA	2 027	1 428	10 852	5 245	886	1 717	362	603	6 568	37 583	b
2012 HPCSA General MPs	1 327	791	5 996	3 208	687	1 276	256	423	3 513	25 053	b
2012 HPCSA Specialist MPs	556	530	4 249	1 708	149	336	86	151	2 670	13 391	b
2012 Registered with HPCSA	1 883	1 321	10 245	4 916	836	1 612	342	574	6 183	38 444	b
Number of medical researchers											
2010 Public sector	-	9	18	12	4	1	1	-	28	107	c
2011 Public sector	-	6	18	11	3	1	1	1	38	109	c
2012 Public sector	-	6	19	15	7	1	1	-	32	109	c
Number of medical specialists											
2010 Private sector	-	-	-	-	-	-	-	-	-	5 410	e
2010 Public sector	240	370	1 721	588	107	62	20	49	1 279	4 442	c
2011 Public sector	231	348	1 760	641	98	66	16	83	1 371	4 620	c
2012 Public sector	223	364	1 782	739	78	66	19	96	1 405	4 776	c
Number of nursing assistants											
2010 Public sector	5 369	2 230	6 877	6 123	4 524	2 103	759	2 730	4 143	34 858	c
2011 Public sector	5 644	2 077	7 053	6 143	5 733	1 981	903	2 744	4 037	36 315	c
2012 Public sector	5 968	2 053	6 829	6 440	5 846	1 874	925	2 721	4 114	36 770	c
Number of nursing assistants registered											
2010 Registered with SANC	6 124	2 951	16 667	11 489	8 331	3 732	1 311	4 732	8 135	63 472	d
2011 Registered with SANC	6 330	3 071	16 532	11 565	8 699	3 963	1 287	4 831	8 248	64 526	d
2012 Registered with SANC	6 428	3 249	16 914	11 987	8 785	4 059	1 259	4 913	8 375	65 969	d
Number of occupational therapists											
2010 Public sector	80	71	171	119	113	55	40	38	151	838	c
2011 Public sector	92	63	201	133	156	62	39	38	156	940	c
2012 Public sector	123	76	239	140	179	73	40	34	134	1 038	c
Number of occupational therapists registered											
2010 Registered with HPCSA	141	232	1 085	347	86	221	49	49	829	3 508	b
2011 Registered with HPCSA	123	205	992	323	83	195	43	43	751	3 629	b
2012 Registered with HPCSA	113	180	919	301	82	182	39	43	690	3 805	b
Number of pharmacists											
2010 Public sector	252	112	751	401	297	266	89	130	660	2 966	c
2011 Public sector	333	194	842	513	348	314	112	158	724	3 550	c
2012 Public sector	368	261	994	600	389	200	120	175	779	3 902	c
Number of pharmacists registered											
2010 Registered with SAPC	775	381	2 917	1 502	344	455	137	443	1 479	12 218	f
2011 Registered with SAPC	1 179	473	4 536	1 743	409	517	164	605	1 992	12 460	f
2012 Registered with SAPC	854	402	4 274	1 540	400	451	139	538	1 852	13 003	f
Number of physiotherapists											
2010 Public sector	110	75	199	231	115	60	56	34	129	1 009	c
2011 Public sector	120	69	212	233	120	68	59	44	132	1 057	c
2012 Public sector	134	83	219	238	141	65	49	63	140	1 132	c
Number of physiotherapists registered											
2010 Registered with HPCSA	240	267	1 831	732	137	311	72	85	1 355	5 777	b
2011 Registered with HPCSA	217	245	1 698	665	122	290	65	75	1 249	5 937	b
2012 Registered with HPCSA	209	225	1 589	640	118	272	62	70	1 178	6 150	b
Number of professional nurses											
2010 Public sector	8 287	1 868	9 393	12 463	7 243	3 732	1 258	3 321	4 399	51 966	c
2011 Public sector	8 980	1 981	10 359	13 377	7 863	4 095	1 333	3 479	4 606	56 075	c
2012 Public sector	9 495	2 227	11 167	14 531	8 435	4 170	1 316	3 713	4 833	59 890	c
Number of professional nurses registered											
2010 Registered with SANC	13 985	7 550	30 063	24 360	9 025	5 714	2 146	7 775	14 626	115 244	d
2011 Registered with SANC	14 118	7 623	30 770	25 440	9 404	5 927	2 202	7 978	14 800	118 262	d
2012 Registered with SANC	14 608	7 788	32 106	27 041	10 080	6 331	2 242	8 394	15 455	124 045	d
Number of psychologists											
2010 Public sector	56	32	176	68	50	18	9	15	74	498	c
2011 Public sector	66	29	183	71	69	19	8	25	75	545	c
2012 Public sector	75	33	186	84	90	19	8	28	85	608	c

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Number of psychologists registered											
2010 Registered with HPCSA	362	238	3 136	709	102	234	40	152	1 388	7 037	b
2011 Registered with HPCSA	332	219	2 953	651	96	221	37	144	1 270	7 160	b
2012 Registered with HPCSA	305	216	2 823	617	91	208	36	139	1 204	7 370	b
Number of pupil auxiliary nurses registered											
2010 Registered with SANC	590	224	3 190	1 336	281	247	113	194	536	6 711	d
2011 Registered with SANC	240	137	2 920	1 280	212	168	113	147	527	5 744	d
2012 Registered with SANC	624	171	2 611	1 371	178	142	113	170	530	5 910	d
Number of pupil nurses registered											
2010 Registered with SANC	1 336	332	6 548	6 354	672	401	0	28	1 165	16 836	d
2011 Registered with SANC	1 081	327	6 550	6 364	584	355	0	2	1 165	16 428	d
2012 Registered with SANC	1 114	366	6 535	6 465	431	372	0	45	1 096	16 424	d
Number of radiographers											
2010 Public sector	359	167	560	455	144	91	57	66	401	2 301	c
2011 Public sector	382	184	601	486	153	89	71	79	408	2 454	c
2012 Public sector	361	198	660	534	154	93	84	96	429	2 611	c
Number of radiographers registered											
2010 Registered with HPCSA	447	380	1 866	1 013	110	324	87	107	1 076	6 215	b
2011 Registered with HPCSA	404	321	1 682	935	104	283	79	92	980	6 431	b
2012 Registered with HPCSA	373	312	1 565	869	96	255	79	83	895	6 748	b
Number of student nurses											
2010 Public sector	1 273	2	4 916	2 272	789	689	4	961	-	10 906	c
2011 Public sector	1 425	-	5 155	2 237	665	643	-	851	-	10 976	c
2012 Public sector	1 044	-	5 299	2 159	630	953	-	664	-	10 749	c
Number of student nurses registered											
2010 Registered with SANC	3 761	1 079	4 839	3 318	1 778	704	168	1 577	2 554	19 778	d
2011 Registered with SANC	3 637	1 205	5 076	3 288	1 865	794	108	1 732	2 876	20 581	d
2012 Registered with SANC	3 758	1 354	5 151	3 009	1 840	911	218	1 729	2 950	20 920	d
Total number of health professional posts											
2010 Public sector (filled)	19 958	6 063	32 656	35 310	17 394	9 455	2 848	8 685	14 957	147 387	c
2011 Public sector (filled)	21 786	6 304	35 048	36 896	20 402	9 855	3 176	8 939	15 440	157 905	c
2012 Public sector (filled)	22 736	6 873	36 484	39 838	21 739	10 173	3 232	9 062	15 911	166 111	c

Reference notes (indicator definitions from page 310 and references from page 315):

- a PERSAL.²⁵⁶ Note that in PERSAL Clinical Associates are a 'Rank' under Medical Practitioners and therefore these numbers are included within the number of MPs.
- b HPCSA.²⁵⁷ Total for South Africa includes those with REGION indicated as Foreign or Unknown. The number on the register includes those professionals who are retired, overseas, working part-time, working in other sectors or not working at all.
- c PERSAL.²⁵⁶ Note that this total includes only the posts that are filled at time of data extraction. The South African total includes the sum of the provinces plus posts within the National Department of Health. Data for Environmental Health Practitioners only include those employed by provincial government. Note that for provinces such as GP and WC a substantial number of EHPs may be employed by local government.
- d SANC.²⁵⁸ The number on the register includes those professionals who are retired, overseas, working part-time, working in other sectors or not working at all.
- e Econex Health Reform Note 7.²⁵⁹ Based on medical scheme industry estimates of doctors visited by members and subsequently reimbursed by schemes. Source also provides adjusted estimates of public and private sector doctors to account for doctors working across both sectors.
- f SAPC.²⁶⁰ The total for South Africa includes large numbers of pharmacists for whom province was unknown and thus the provincial breakdown should be interpreted with caution. The number on the register also includes those professionals who are retired, overseas, working part-time, working in other sectors or not working at all.

Table 27: Public and private sector health personnel per 100 000 sector population

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Dental practitioners per 100 000 population											
2010 Public sector	1.63	2.59	2.73	0.91	1.98	2.35	2.56	1.33	1.94	1.86	a
2011 Public sector	1.85	2.42	2.65	1.13	2.64	3.29	2.80	1.71	2.76	2.19	a
2012 Public sector	1.96	2.87	2.65	1.20	3.10	3.29	2.57	1.74	2.91	2.31	a
Dental specialists per 100 000 population											
2010 Public sector	0.00	-	0.69	0.09	0.00	1.14	-	0.03	0.54	0.29	a
2011 Public sector	0.00	0.00	0.81	0.07	0.02	0.38	0.00	0.00	0.81	0.28	a
2012 Public sector	-	-	1.16	0.01	0.02	0.32	0.10	-	0.71	0.33	a
Dental therapists per 100 000 population											
2010 Public sector	0.14	0.08	0.50	0.27	1.31	0.60	1.02	0.53	0.07	0.45	a
2011 Public sector	0.14	0.08	0.46	0.30	1.12	0.54	1.00	0.60	0.07	0.42	a
2012 Public sector	0.19	0.08	0.49	0.85	1.53	0.66	0.89	0.59	0.05	0.61	a
Enrolled nurses per 100 000 population											
2010 Public sector	40.3	18.2	63.2	100.1	57.0	44.9	19.3	25.8	53.8	58.8	a
2011 Public sector	47.8	26.8	68.9	107.6	80.3	49.8	21.6	24.8	54.0	65.8	a
2012 Public sector	54.4	30.9	67.2	115.0	88.6	51.7	21.7	24.5	55.2	69.9	a
Environmental health practitioners per 100 000 population											
2010 Public sector	2.17	2.13	1.41	1.85	3.26	4.00	1.13	1.00	0.22	1.92	a
2011 Public sector	1.93	2.09	1.32	2.03	3.22	4.00	1.90	1.11	0.21	1.92	a
2012 Public sector	1.89	3.28	1.56	1.98	3.24	5.10	2.27	1.38	0.12	2.12	a
Medical practitioners per 100 000 population											
2010 Private sector	-	-	-	-	-	-	-	-	-	37.0	b
2010 Public sector adjusted	-	-	-	-	-	-	-	-	-	35.0	b
2010 Public sector	22.4	24.1	31.5	33.2	20.1	22.5	32.9	16.0	34.2	27.3	a
2011 Public sector	25.5	24.1	33.7	34.6	20.7	22.5	36.1	19.9	34.8	29.0	a
2012 Public sector	24.9	27.2	34.6	33.9	21.6	23.1	38.8	20.2	34.7	29.4	a
Medical researchers per 100 000 population											
2010 Public sector	-	0.38	0.23	0.13	0.08	0.03	0.10	-	0.69	0.26	a
2011 Public sector	0.00	0.25	0.22	0.12	0.06	0.03	0.10	0.03	0.91	0.26	a
2012 Public sector	-	0.25	0.23	0.16	0.14	0.03	0.10	-	0.76	0.26	a
Medical specialists per 100 000 population											
2010 Private sector	-	-	-	-	-	-	-	-	-	57.0	c
2010 Public sector adjusted	-	-	-	-	-	-	-	-	-	10.0	c
2010 Public sector	4.1	15.5	21.9	6.4	2.2	2.0	2.1	1.6	31.5	10.7	a
2011 Public sector	3.9	14.3	21.9	7.2	2.0	2.1	1.6	2.8	32.7	11.2	a
2012 Public sector	3.8	14.9	21.1	7.9	1.6	2.1	1.9	3.2	33.2	11.2	a
Nursing assistants per 100 000 population											
2010 Public sector	91.0	93.2	87.3	66.4	94.4	66.8	77.8	91.1	101.9	84.2	a
2011 Public sector	96.5	85.2	87.8	68.6	119.2	63.3	90.2	92.0	96.1	87.7	a
2012 Public sector	100.6	84.1	80.9	68.6	119.3	59.3	91.5	89.5	97.4	86.4	a
Occupational therapists per 100 000 population											
2010 Public sector	1.4	3.0	2.2	1.3	2.4	1.7	4.1	1.3	3.7	2.0	a
2011 Public sector	1.6	2.6	2.5	1.5	3.2	2.0	3.9	1.3	3.7	2.3	a
2012 Public sector	2.1	3.1	2.8	1.5	3.7	2.3	4.0	1.1	3.2	2.4	a
Pharmacists per 100 000 population											
2010 Public sector	4.3	4.7	9.5	4.3	6.2	8.4	9.1	4.3	16.2	7.2	a
2011 Public sector	5.7	8.0	10.5	5.7	7.2	10.0	11.2	5.3	17.2	8.6	a
2012 Public sector	6.2	10.7	11.8	6.4	7.9	6.3	11.9	5.8	18.4	9.2	a
Physiotherapists per 100 000 population											
2010 Public sector	1.86	3.13	2.53	2.50	2.40	1.90	5.74	1.13	3.17	2.44	a
2011 Public sector	2.05	2.83	2.64	2.60	2.50	2.17	5.90	1.47	3.14	2.55	a
2012 Public sector	2.26	3.40	2.59	2.54	2.88	2.06	4.84	2.07	3.31	2.66	a
Professional nurses per 100 000 population											
2010 Public sector	140.5	78.1	119.3	135.1	151.1	118.5	129.0	110.8	108.2	125.6	a
2011 Public sector	153.5	81.3	129.0	149.4	163.5	130.9	133.2	116.6	109.7	135.4	a
2012 Public sector	160.1	91.2	132.3	154.8	172.1	132.0	130.1	122.1	114.4	140.8	a
Psychologists per 100 000 population											
2010 Public sector	0.95	1.34	2.23	0.74	1.04	0.57	0.92	0.50	1.82	1.20	a
2011 Public sector	0.00	1.19	2.28	0.79	1.43	0.61	0.80	0.84	1.79	1.32	a
2012 Public sector	1.26	1.35	2.20	0.89	1.84	0.60	0.79	0.92	2.01	1.43	a

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Radiographers per 100 000 population											
2010 Public sector	6.1	7.0	7.1	4.9	3.0	2.9	5.8	2.2	9.9	5.6	a
2011 Public sector	6.5	7.5	7.5	5.4	3.2	2.8	7.1	2.6	9.7	5.9	a
2012 Public sector	6.1	8.1	7.8	5.7	3.1	2.9	8.3	3.2	10.2	6.1	a
Student nurses per 100 000 population											
2010 Public sector	21.6	0.1	62.4	24.6	16.5	21.9	0.4	32.1	-	26.4	a
2011 Public sector	24.4	0.0	64.2	25.0	13.8	20.6	0.0	28.5	0.0	26.5	a
2012 Public sector	17.6	-	62.8	23.0	12.9	30.2	-	21.8	-	25.3	a

Reference notes (indicator definitions from page 310 and references from page 315):

- a PERSAL.²⁵⁶ Note that this value was calculated using only the posts that are filled at time of data extraction. Population estimates for the applicable year and medical scheme coverage from StatsSA GHS were used to estimate the public sector dependent population denominator.
- b Econex Health Reform Note 7.²⁵⁹ Based on evidence that at least 36.9% of population utilise private medical services for PHC, and thus the population served by the private sector doctors is greater than the number of medical scheme beneficiaries.
- c Econex Health Reform Note 7.²⁵⁹ Based on evidence that about 15% of patients seeing private specialists are not medical scheme beneficiaries.

Table 28: Number of health personnel by ethnic group

	African	Coloured	Indian	White	Other	All	Ref
Number of clinical associates							
2012 Public sector	61	1	2	-	-	64	a
Number of clinical associates registered							
2012 Registered with HPCSA	85	1	2	4	1	93	b
Number of dental practitioners							
2012 Public sector	481	98	188	215	-	982	c
Number of dental practitioners registered							
2012 Registered with HPCSA	748	204	897	2 004	1 719	5 572	b
Number of dental specialists							
2012 Public sector	37	8	33	63	-	141	c
Number of dental therapists							
2012 Public sector	222	3	30	4	-	259	c
Number of dental therapists registered							
2012 Registered with HPCSA	293	3	107	30	103	536	b
Number of enrolled nurses							
2012 Public sector	26 530	2 398	343	464	-	29 735	c
Number of environmental health practitioners							
2012 Public sector	842	22	11	26	-	901	c
Number of environmental health practitioners registered							
2012 Registered with HPCSA	1 804	174	73	389	775	3 215	b
Number of medical practitioners							
2012 Public sector	6 316	640	1 944	3 608	-	12 508	c
Number of medical practitioners (including specialists) registered							
2012 HPCSA General MPs	6 779	762	3 621	10 021	3 870	25 053	b
2012 HPCSA Specialist MPs	1 575	165	1 693	6 915	3 043	13 391	b
2012 Registered with HPCSA	8 354	927	5 314	16 936	6 913	38 444	b
Number of medical researchers							
2012 Public sector	55	21	9	24	-	109	c
Number of medical specialists							
2012 Public sector	1 289	244	929	2 314	-	4 776	c
Number of nursing assistants							
2012 Public sector	31 868	3 845	230	827	-	36 770	c
Number of occupational therapists							
2012 Public sector	393	102	93	450	-	1 038	c
Number of occupational therapists registered							
2012 Registered with HPCSA	479	205	264	2 398	459	3 805	b
Number of pharmacists							
2012 Public sector	2 105	504	517	776	-	3 902	c

	African	Coloured	Indian	White	Other	All	Ref
Number of pharmacists registered							
2012 Registered with SAPC	2 047	443	2 472	7 947	96	13 003	d
Number of physiotherapists							
2012 Public sector	476	174	165	317	-	1 132	c
Number of physiotherapists registered							
2012 Registered with HPCSA	817	435	542	3 247	1 109	6 150	b
Number of professional nurses							
2012 Public sector	50 676	5 483	1 409	2 322	-	59 890	c
Number of psychologists							
2012 Public sector	258	35	41	274	-	608	c
Number of psychologists registered							
2012 Registered with HPCSA	723	256	430	4 214	1 747	7 370	b
Number of radiographers							
2012 Public sector	1 388	468	291	464	-	2 611	c
Number of radiographers registered							
2012 Registered with HPCSA	1 568	568	594	2 163	1 855	6 748	b
Number of student nurses							
2012 Public sector	10 014	269	269	197	-	10 749	c
Total number of health professional posts							
2012 Public sector (filled)	132 950	14 314	6 502	12 345	-	166 111	c

Reference notes (indicator definitions from page 310 and references from page 315):

- a PERSAL.²⁵⁶ Note that in PERSAL Clinical Associates are a 'Rank' under Medical Practitioners and therefore these numbers are included within the number of MPs.
- b HPCSA.²⁵⁷ Total for South Africa includes those with unknown ethnic group. The number on the register includes those professionals who are retired, overseas, working part-time, working in other sectors or not working at all.
- c PERSAL.²⁵⁶ Note that this total includes only the posts that are filled at time of data extraction. The South African total includes the sum of the plus those of unknown group. Data for Environmental Health Practitioners only include those employed by provincial government.
- d SAPC.²⁶⁰ The total for South Africa includes pharmacists for whom ethnic group was unknown. The number on the register also includes those professionals who are retired, overseas, working part-time, working in other sectors or not working at all.

Table 29: Number of community service professionals

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Number of CS clinical psychologists											
2010	11	6	58	18	6	2	3	5	10	126	a
2011	12	1	47	12	7	2	1	0	12	111	a
2012	14	3	43	11	6	2	1	4	13	108	a
Number of CS dentists											
2010	20	25	19	35	24	47	10	16	15	233	a
2011	16	22	9	26	21	46	13	15	15	206	a
2012	13	23	8	22	22	32	13	10	14	178	a
Number of CS dieticians											
2010	15	15	36	31	30	18	9	4	10	175	a
2011	16	10	42	32	37	5	11	16	10	183	a
2012	21	10	50	27	32	24	13	11	12	207	a
Number of CS doctors											
2010	160	47	215	214	98	91	65	105	155	1 197	a
2011	172	51	208	194	96	97	83	93	160	1 215	a
2012	136	44	134	146	110	106	87	88	131	1 027	a
Number of CS environmental health practitioners											
2010	17	25	25	54	28	26	8	17	5	220	a
2011	21	23	34	55	22	23	7	9	5	213	a
2012	17	22	31	34	37	30	11	12	5	211	a
Number of CS nurses											
2010	478	167	741	255	201	217	70	210	265	2 655	a
2011	429	209	644	339	221	143	66	250	320	2 624	a
2012	567	127	680	368	313	5	-	165	342	2 571	a
Number of CS occupational therapists											
2010	26	27	59	48	31	19	18	9	18	262	a
2011	28	18	68	44	14	15	13	8	15	227	a
2012	31	26	70	32	25	23	17	9	14	248	a
Number of CS pharmacists											
2010	28	23	45	43	52	29	18	30	45	344	a
2011	32	29	51	39	50	34	28	25	34	358	a
2012	38	31	38	36	0	33	25	28	32	311	a
Number of CS physiotherapists											
2010	39	24	71	62	34	26	23	12	23	323	a
2011	46	19	79	55	21	22	17	12	20	299	a
2012	46	24	90	41	31	26	18	17	21	319	a
Number of CS radiographers											
2010	24	16	104	50	19	13	20	8	45	303	a
2011	29	23	102	49	19	9	22	17	49	323	a
2012	38	25	109	57	25	17	16	18	47	357	a
Number of CS speech therapists											
2010	8	8	52	32	12	15	12	6	8	156	a
2011	14	8	44	31	6	13	4	7	7	137	a
2012	15	7	55	30	10	16	10	4	6	154	a

Reference notes (indicator definitions from page 310 and references from page 315):

- a DoH Community Service.²⁶¹ The national figure also includes CSPs allocated to SA Military Health Services - SAMHS and Department of Correctional Services - DCS and is therefore greater than the sum of provincial figures.

Health financing

Context	Globally, the aim to ensure Universal Health Coverage (UHC) has galvanised many sets of actors, including policy researchers. Locally, that debate is framed in terms of the National Health Insurance reforms, for which the potential financing mechanisms are still being investigated.
New data sources	Nationally, new data have been reported in the: <ul style="list-style-type: none"> • Medical Schemes Annual Report 2011-12 • NHI Policy Brief 21: Myths about Medical Schemes • Mediscor Medicines Review 2012 • National Treasury databases Internationally, reports of interest include: <ul style="list-style-type: none"> • Institute for Health Metrics and Evaluation. Financing Global Health 2011 and 2012:
Key issues and trends	Although the Green Paper on National Health Insurance was issued in 2011, the final version of this policy (the White Paper) has not yet been produced. A key step is expected to be a discussion paper on financing options, expected to be issued by the Treasury in 2013.

The Lancet published a themed issue on Universal Health Coverage (UHC) in September 2012. In an introductory comment, Frenk and De Ferranti explained that “[t]he paradox of health care is that it is one of the most powerful ways of fighting poverty, yet can itself become an impoverishing factor for families when societies do not ensure effective coverage with financial protection for all”.²⁶² Tracking progress towards UHC is complicated by the lack of “common, comparable indicators”.²⁶³

A series of reports on global health financing have been issued by the Institute for Health Metrics and Evaluation (IHME). The 2011 version focused on development assistance for health (DAH) and government expenditure.²⁶⁴ The 2012 report noted that despite global macroeconomic stress, DAH has been sustained at a high level.²⁶⁵ This edition has also incorporated information from the Global Burden of Disease study, allowing the authors to relate DAH to burden of disease. The same group have also provided a comprehensive time series (1950 to 2015) of gross domestic product per capita data for 2010 countries.²⁶⁶

In terms of the South African reform trajectory, this continues to be a fertile case study for research and commentary.²⁶⁷⁻²⁶⁹ Advocacy work in this regard continues to be produced by or on behalf of a variety of actors.²⁷⁰⁻²⁷³

Private sector financing

The major source of accessible data about the private healthcare sector remains the annual report of the Council for Medical Schemes (CMS).³⁶ Consolidation in the medical scheme environment has continued, with the total number of registered schemes dropping from 99 to 95 in 2012. However, a large number of benefit options was still available (169 open scheme options and 142 closed scheme options). There were 16 third-party administrators and eight self-administered medical schemes at the end of the reporting period, as well as 40 registered managed care organisations. Against a total of R107.4 billion collected in contributions in 2011, medical schemes spent R93.2 billion on healthcare benefits. In terms of the major expenditure categories, an increase in the amounts spent on private hospitals and on specialists was again noted. In real terms, medical schemes spent 15.2% more on medicines in 2011 (R15.2 billion) than in 2000 (R13.2 billion). As in previous years, the only

accessible detailed report on medicines expenditure and trends is that provided by the administrator Mediscor.²⁷⁴

The received wisdom in relation to medical scheme coverage is that it has remained relatively stagnant over time, and has continued to reflect an entrenched racially-defined system. This perception has been challenged in a recent policy brief in the series issued by Innovative Medicines South Africa (IMSA).²⁷³ Based on the reported number of medical scheme beneficiaries and the ASSA2008 population denominators, medical scheme coverage has fluctuated between 14.5% and 17.1% of the population between 1985 and 2010. However, by drawing on data from multiple sources, McLeod has shown that marked changes in the ethnicity of these beneficiaries have occurred. The IMSA policy brief therefore points out that “[i]n 1980 only 7.9% of those covered by medical schemes were African/Black. This proportion grew steadily to 30.9% by 1994 and to 46.3% by 2010.” (Figure 5 in appendix). Despite this growth, by 2011, only 8.9% of Africans were beneficiaries of a medical scheme, according to the General Household Survey (Table 33).³⁷ Govender et al. investigated whether lessons could be learned from the introduction of the GEMS medical scheme for civil servants in terms of aligning financing strategies with the global imperative of UHC.²⁷⁵ They found that a considerable portion of socio-economically vulnerable groups (such as the lowest salaried civil servants) remained uninsured, citing barriers such as a lack of information, the unaffordability of payments and perceived administrative complexity.

Public sector financing

Expenditure on services in the public health sector consists primarily of provincial health expenditure, which is sourced through the provincial equitable share,^e conditional grants^f and provincial own revenue. A very small proportion of expenditure on health is from development partners or donor agencies, and is the main source for health research. Provincial health expenditure is recorded in the Basic Accounting System (BAS) and is classified under eight budget programmes (Table 30). Table 31 shows expenditure by

e The equitable share formula is used to divide funding from national government between provinces. Provincial governments then determine what proportion is used for health relative to other services.

f These funds are allocated to the provincial health departments by national government for specific (ring-fenced) areas of spending, such as tertiary hospitals, HIV programmes, hospital revitalisation, forensic pathology, training and health infrastructure.

sub-programme within District Health Services. Local government (LG) also provides some primary health care (PHC) services, and thus net LG expenditure⁹ is included in the per capita expenditure on non-hospital PHC indicator (Table 32).

Overall, public sector expenditure on health has increased strongly in real terms, with an average annual growth of 8.5% from 2007/08 to 2011/12.⁵⁴

Table 30: Provincial health expenditure by programme (Rand million), 2011/12

Programme	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA
1. Administration	596	273	443	388	262	403	108	275	410	3 158
2. District Health Services	7 290	2 656	7 239	10 834	6 428	4 025	1 324	3 232	4 879	47 908
3. Emergency Health Services	645	434	697	1 106	503	242	185	208	637	4 656
4. Provincial Hospital Services	3 864	1 631	5 928	7 136	1 439	856	817	1 578	2 150	25 399
5. Central Hospital Services	627	1 113	7 132	2 513	1 029	701	-	194	4 011	17 320
6. Health Sciences and Training	606	150	723	906	376	249	69	227	231	3 537
7. Health Care Support Services	79	97	174	14	535	117	28	127	301	1 472
8. Health Facilities Management	1 245	473	1 317	1 895	800	632	490	539	799	8 191
Other	-	-	3	-	-	-	-	-	-	3
Total	14 951	6 826	23 656	24 791	11 372	7 225	3 020	6 380	13 419	111 642

Source: National Treasury (BAS). These are preliminary outcome figures and may be adjusted once audited, or differ from figures published in other sources if extracted on a different date.

Table 31: Provincial health expenditure on district health services (Rand million), 2011/12

Sub-programme	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA
2.1 District Management	606	76	435	167	484	260	104	221	252	2 605
2.2 Community Health Clinics	1 399	674	1 439	2 341	1 607	737	309	652	953	10 112
2.3 Community Health Centres	731	63	1 066	773	285	467	174	594	1 061	5 214
2.4 Community-based Services	399	346	824	26	116	108	0	14	147	1 979
2.5 Other Community Services	117	0	0	648	170	0	54	142	0	1 131
2.6 HIV/AIDS	895	518	1 728	1 914	578	420	238	611	661	7 563
2.7 Nutrition	57	10	32	65	17	21	3	9	24	238
2.8 Coroner Services	85	39	130	137	0	0	27	28	0	445
2.9 District Hospitals	3 001	930	1 586	4 763	3 172	2 012	415	959	1 674	18 512
2. Other*	0	0	0	0	0	0	0	0	108	108
Total	7 290	2 656	7 239	10 834	6 428	4 025	1 324	3 232	4 879	47 908

Source: National Treasury (BAS). These are preliminary outcome figures and may be adjusted once audited, or differ from figures published in other sources if extracted on a different date.

⁹ Local government 'own' expenditure on PHC less transfers from provincial governments to municipalities for provision of these services. Data collected by National Treasury.

Table 32: Health financing indicators by province

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA	Ref
Claims ratio (%)											
2009	-	-	-	-	-	-	-	-	-	89.3	a
2010	-	-	-	-	-	-	-	-	-	87.3	b
2011	-	-	-	-	-	-	-	-	-	86.5	c
Medical scheme beneficiaries											
2009	690 619	379 930	2 909 955	1 233 940	379 429	553 501	168 711	440 911	1 294 986	8 068 505	d
2010	708 097	388 514	3 010 299	1 287 219	407 410	576 026	175 318	461 521	1 294 088	8 315 718	e
2011	714 768	396 912	3 088 425	1 309 211	436 391	582 639	181 683	501 489	1 306 453	8 526 409	f
Medical scheme coverage (%)											
2009 GHS	11.4	18.0	26.6	12.5	8.7	13.3	15.4	13.7	25.5	16.9	g
2009 med schemes	10.4	13.1	27.6	11.8	7.3	15.3	14.7	12.8	24.2	16.4	a
2010 GHS	12.1	16.8	26.5	15.7	8.6	14.6	13.6	14.7	24.4	17.6	h
2010 med schemes	10.5	13.8	26.9	12.1	7.5	15.9	15.9	14.4	24.8	16.6	b
2011 GHS	11.1	17.0	23.9	12.3	7.2	14.4	13.0	13.6	25.1	16.1	i
2011 med schemes	10.5	14.4	27.3	12.1	7.9	15.9	16.6	15.4	24.7	16.9	c
Pensioner ratio (%)											
2009	-	-	-	-	-	-	-	-	-	6.5	a
2010	-	-	-	-	-	-	-	-	-	6.5	b
2011	-	-	-	-	-	-	-	-	-	6.6	c
Per capita expenditure (non-hospital PHC)											
2009 real 2011/12 prices	500	539	618	584	516	436	596	627	670	569	j
2010 real 2011/12 prices	650	623	718	600	553	539	760	706	765	649	j
2011 real 2011/12 prices	646	668	760	658	589	572	824	715	798	684	j
Per capita health expenditure											
2011 Private (med schemes)	-	-	-	-	-	-	-	-	-	11 084	k
2011 Public (provincial)	2 536	2 820	2 882	2 668	2 367	2 277	3 083	2 166	3 241	2 667	l

Reference notes (indicator definitions from page 310 and references from page 315):

- a Medical Schemes 2009-10.²⁷⁶
- b Medical Schemes 2010-11.²⁷⁷
- c Medical Schemes 2011-12.³⁶
- d Medical Schemes 2009-10.²⁷⁶ SA total includes 16 523 beneficiaries outside SA. Provincial numbers are calculated primarily on the basis of the location of principal members.
- e Medical Schemes 2010-11.²⁷⁷ SA total includes 7 226 beneficiaries outside SA. Provincial numbers are calculated primarily on the basis of the location of principal members.
- f Medical Schemes 2011-12.³⁶ SA total includes 8 438 beneficiaries outside SA. Provincial numbers are calculated primarily on the basis of the location of principal members.
- g StatsSA GHS 2009.⁶⁸ Data revised and reweighted according to Dec 2006 provincial boundaries and updated population estimates.
- h StatsSA GHS 2010.⁶⁹
- i StatsSA GHS 2011.³⁷
- j DHB 2011/12.⁵⁴ Data extracted June 2012. Data for financial year from April of the year to March of the following year (not calendar year).
- k Medical Schemes 2011-12.³⁶ Calculated from average benefits paid per beneficiary per month R923.70 x 12.
- l National Treasury. Calculated from provincial expenditure (National Treasury) per uninsured population. For 2011/12 financial year in nominal prices.

Table 33: Medical scheme coverage by ethnic group

	African	Coloured	Indian	White	Other	All	Ref
Medical scheme coverage							
2009 GHS	9.0	21.4	42.7	74.4	-	16.9	a
2010 GHS	10.3	21.8	46.8	70.9	-	17.6	b
2011 GHS	8.9	20.3	41.1	69.7	-	16.1	c

Reference notes (indicator definitions from page 310 and bibliography of reference sources from page 315):

- a StatsSA GHS 2009.⁶⁸ Data revised and reweighted according to Dec 2006 provincial boundaries and updated population estimates.
- b StatsSA GHS 2010.⁶⁹
- c StatsSA GHS 2011.³⁷

Acknowledgements

As in previous years this chapter is very much the product of collective efforts at all levels of the health system over many years. In particular we acknowledge the national and provincial Departments of Health for the use of data from the District Health Information System and various other databases and publications. Other people and institutions have also contributed significantly, including Mark Blecher of National Treasury, Gayle Sherman of the National Health Laboratory Service, Pam Groenewald, Debbie Bradshaw and colleagues from the Medical Research Council. Thanks are due to HST colleagues Nienke van Schaik for contributing to the sections on reproductive and maternal health and reviewing the chapter, and to Algernon Africa for data capture. We also appreciate the perceptive review comments and strategic inputs of the team of reviewers (Mark Blecher, Peter Barron, Heather McLeod).

Appendices

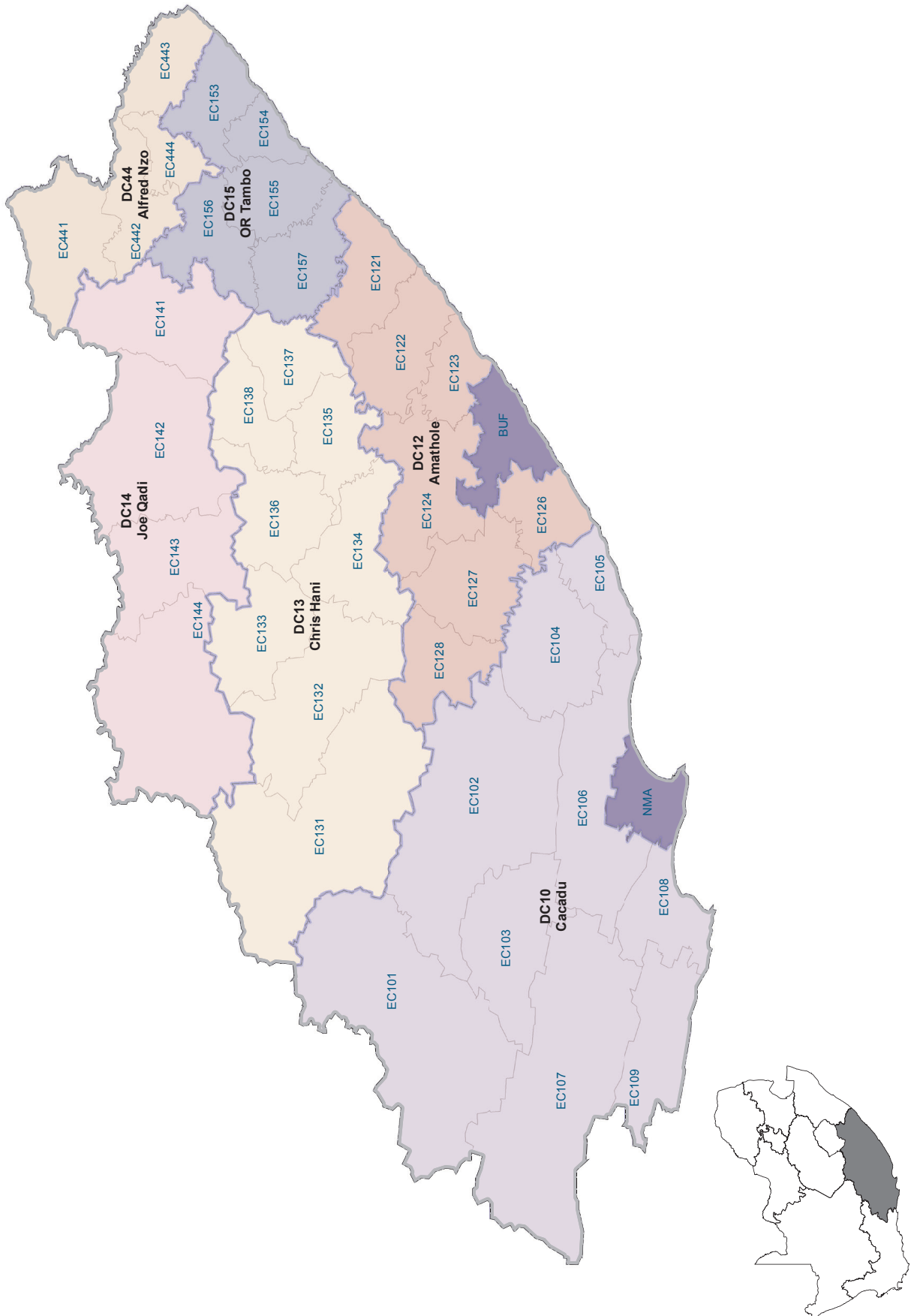
Provincial maps

The maps show the district and sub-district boundaries according to the new demarcation which came into effect with the local government elections in May 2011. The boundaries of wards and districts are determined by the Municipal Demarcation Board (MDB). As at September 2010, the MDB demarcated 4 277 wards in 231 local municipalities within eight metropolitan councils and 45 districts. Wards are voting areas, as used by the Independent Electoral Commission and have been identified as the level of service delivery for PHC outreach teams by the PHC Re-engineering Strategy.

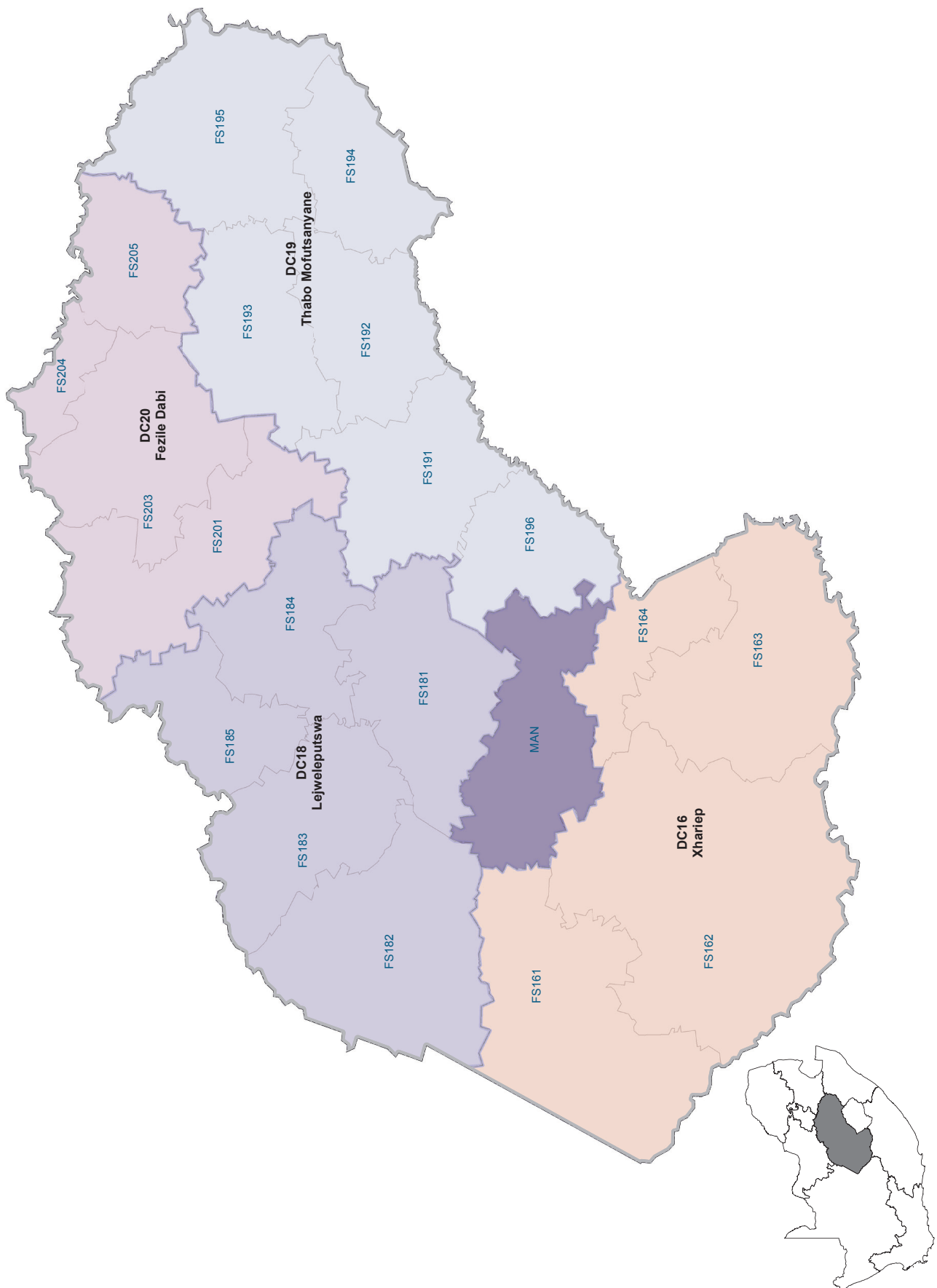
The main changes made to district boundaries in 2011 included the following:

- the removal of all district managed areas (DMAs) and the incorporation of these areas within district municipalities (DMs);
- the creation of two new metropolitan municipalities (Buffalo City and Mangaung);
- the removal of the Motheo district in the Free State, with the outlying areas re-allocated to the Xhariep and Thabo Mofutsanyane district municipalities and the Bloemfontein urban area becoming the Mangaung metropolitan municipality;
- the absorption of Metsweding district municipality into the City of Tshwane metropolitan municipality;
- the re-allocation of the local municipalities of Mbizana (EC151) and Ntabankulu (EC152) from the OR Tambo district municipality to the Alfred Nzo district municipality, becoming EC443 and EC444 respectively;
- the merger of Kagisano (NW391) and Molopo (NW395) into one local municipality, Kagisano/Molopo (NW397); and
- the renaming of several districts and municipalities.

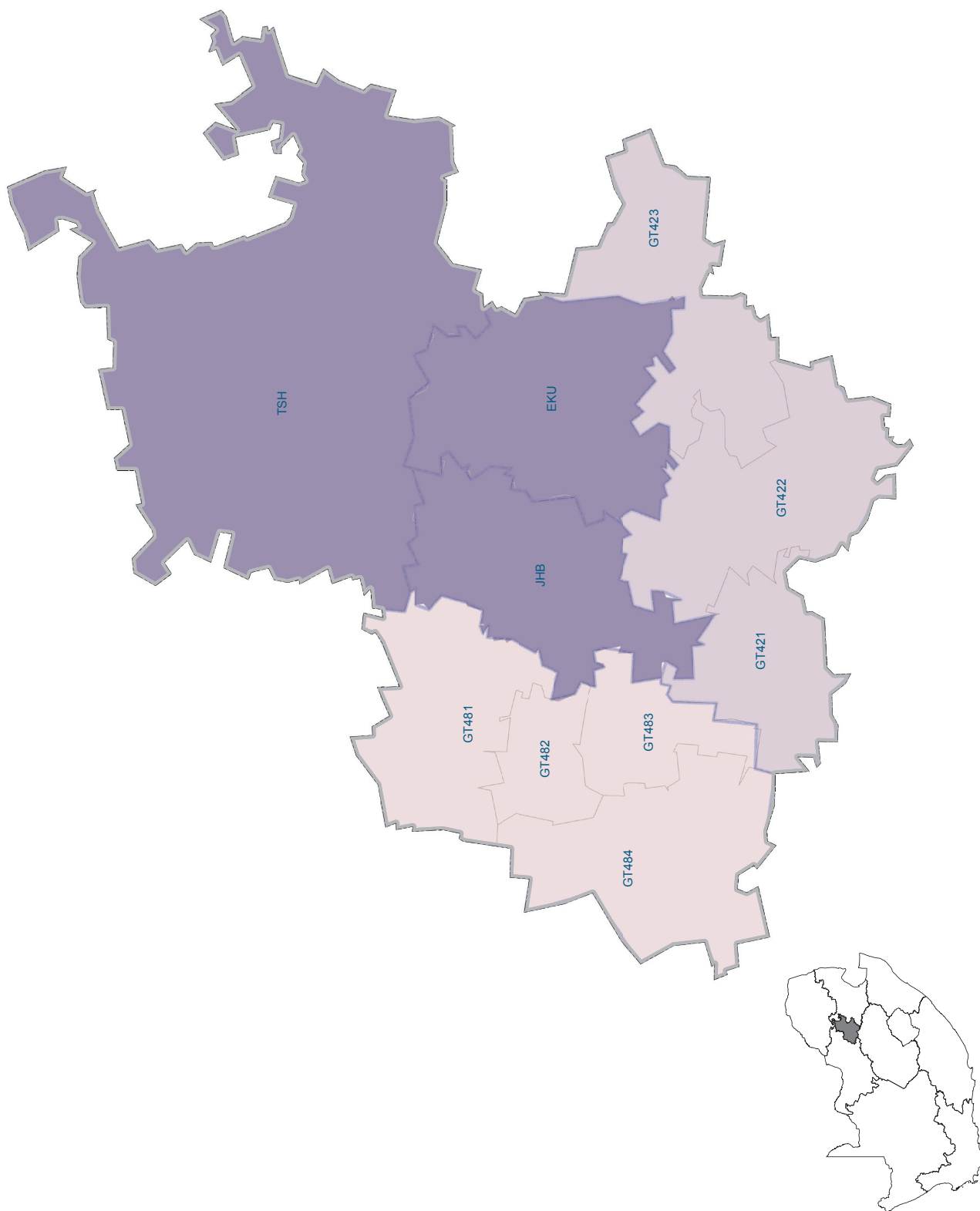
Map 1: Districts and municipalities of the Eastern Cape, 2011 boundaries



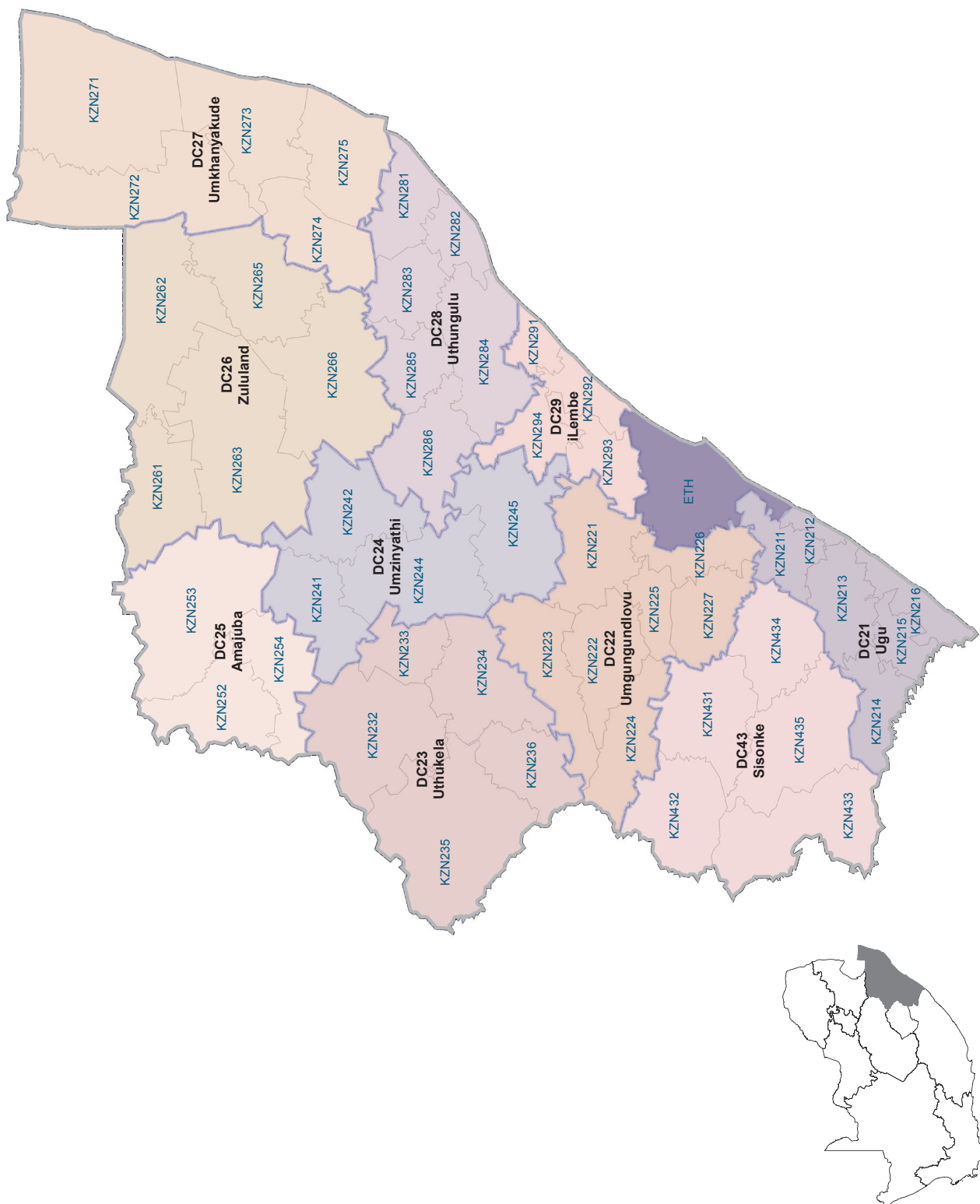
Map 2: Districts and municipalities of the Free State, 2011 boundaries



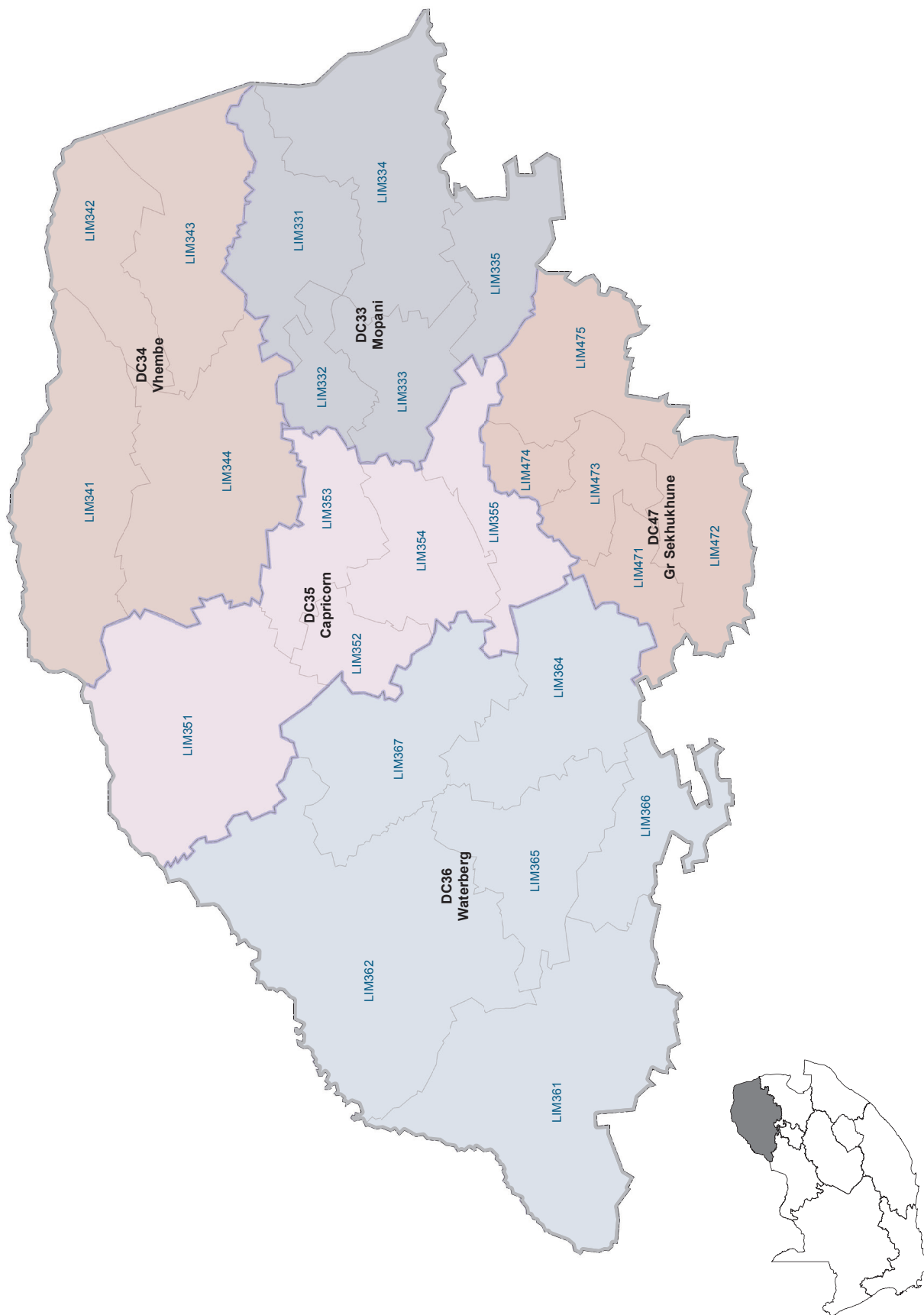
Map 3: Districts and municipalities of Gauteng, 2011 boundaries



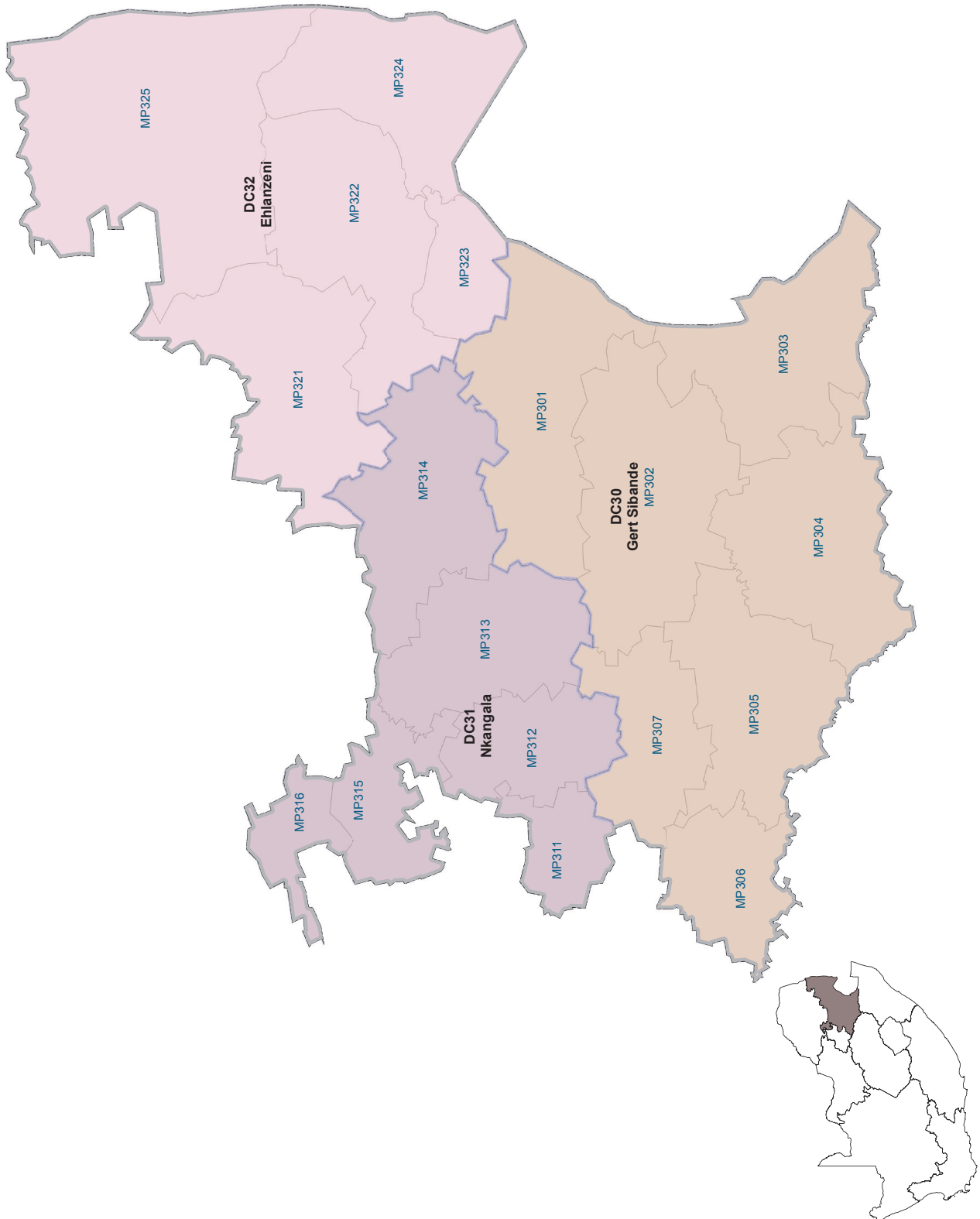
Map 4: Districts and municipalities of KwaZulu-Natal, 2011 boundaries



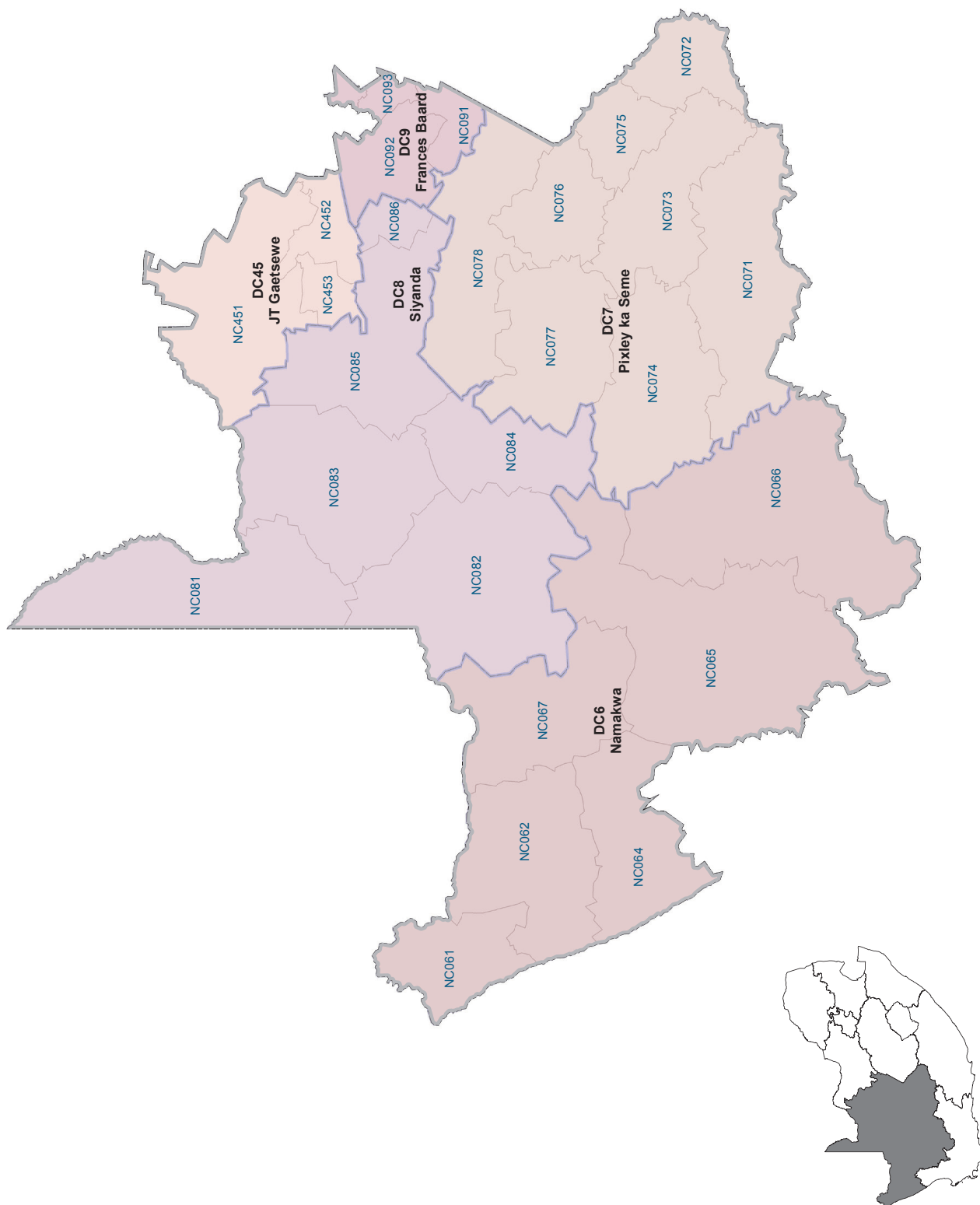
Map 5: Districts and municipalities of Limpopo, 2011 boundaries



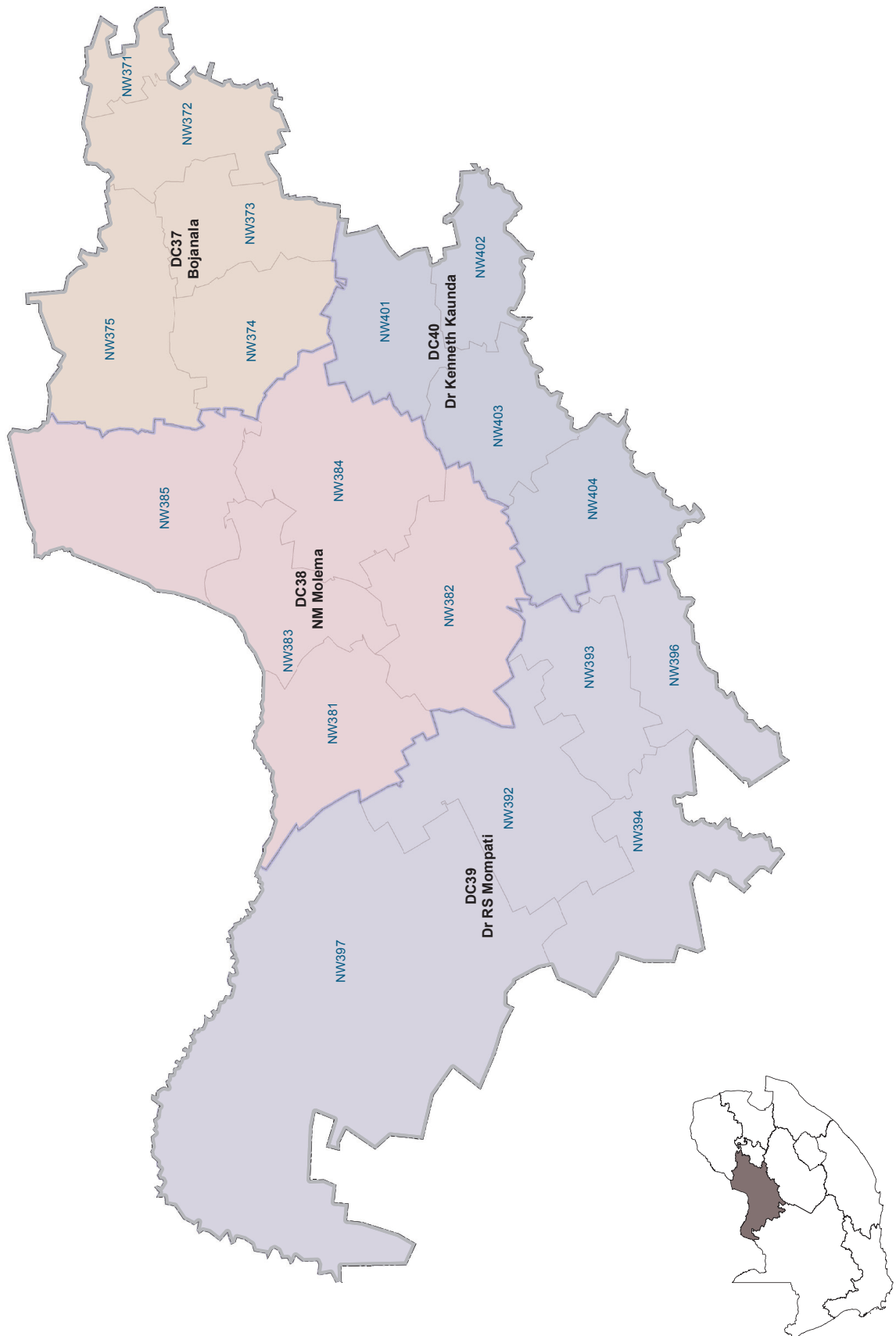
Map 6: Districts and municipalities of Mpumalanga, 2011 boundaries



Map 7: Districts and municipalities of the Northern Cape, 2011 boundaries



Map 8: Districts and municipalities of the North West, 2011 boundaries



Map 9: Districts and municipalities of the Western Cape, 2011 boundaries

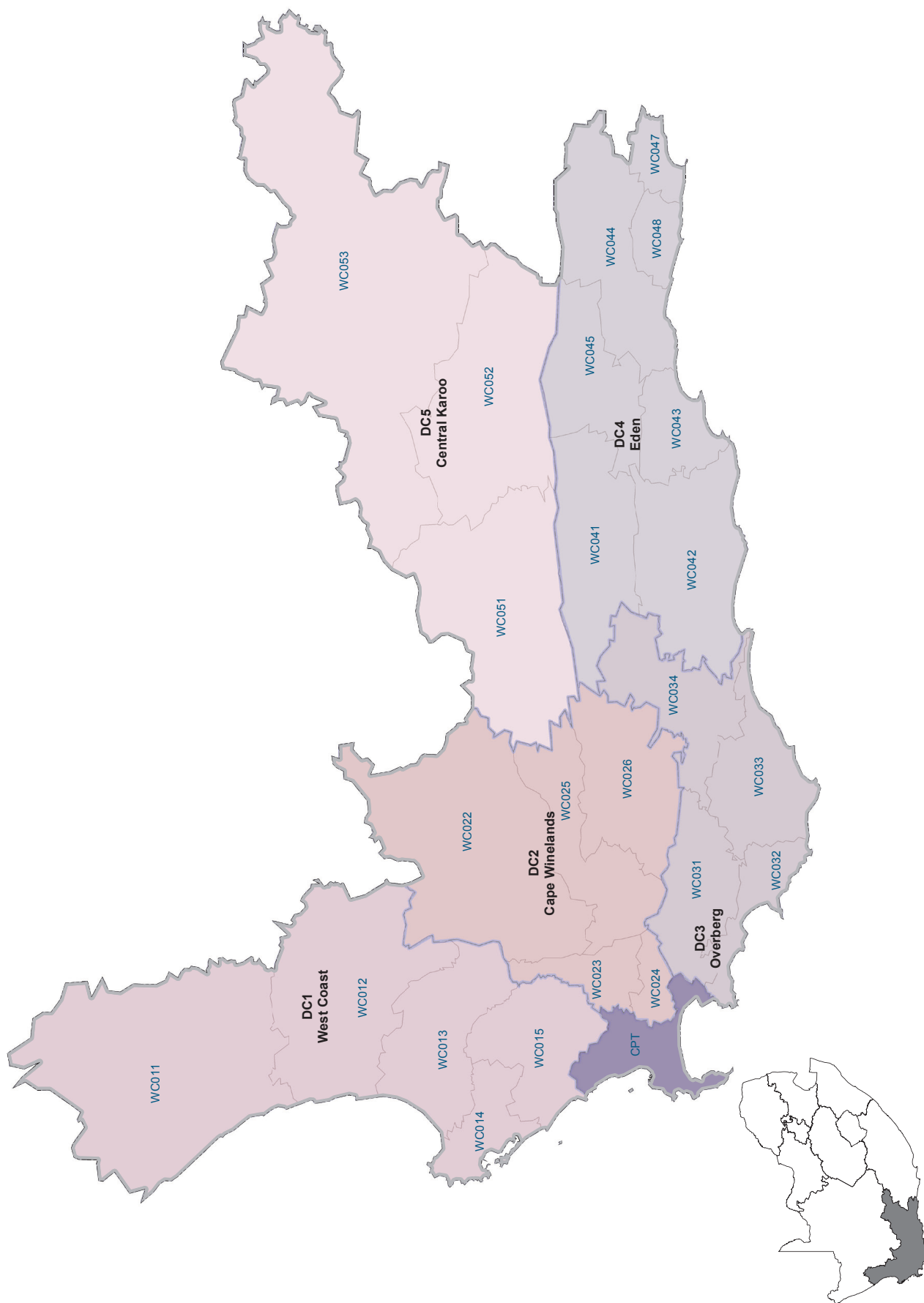


Table 34: Census 2011 Population by municipality according to the new (2011) demarcation

Province	District	Municipality	Male	Female	Total
Eastern Cape	DC10: Cacadu	EC101: Camdeboo	24 835	26 158	50 993
		EC102: Blue Crane Route	17 680	18 322	36 002
		EC103: Ikwezi	5 055	5 482	10 537
		EC104: Makana	38 175	42 215	80 390
		EC105: Ndlambe	29 035	32 141	61 176
		EC106: Sundays River Valley	27 761	26 743	54 504
		EC107: Baviaans	8 709	9 052	17 761
		EC108: Kouga	48 591	49 967	98 558
		EC109: Kou-Kamma	20 405	20 258	40 663
	DC12: Amathole	EC121: Mbhashe	117 230	137 679	254 909
		EC122: Mngquma	117 873	134 517	252 390
		EC123: Great Kei	18 703	20 287	38 990
		EC124: Amahlathi	58 647	64 131	122 778
		EC126: Ngqushwa	33 984	38 206	72 190
		EC127: Nkonkobe	61 133	65 982	127 115
		EC128: Nxuba	11 677	12 587	24 264
	DC13: Chris Hanani	EC131: Inxuba Yethemba	31 670	33 889	65 559
		EC132: Tsolwana	15 656	17 625	33 281
		EC133: Inkwanca	10 676	11 295	21 971
		EC134: Lukanji	90 620	100 103	190 723
		EC135: Intsika Yethu	68 797	76 575	145 372
		EC136: Emalahleni	56 620	62 839	119 459
		EC137: Engcobo	71 953	83 560	155 513
		EC138: Sakhisizwe	30 646	32 936	63 582
	DC14: Joe Gqabi	EC141: Elundini	65 482	72 658	138 140
		EC142: Senqu	62 805	71 346	134 151
		EC143: Maletswai	20 735	23 065	43 800
		EC144: Gariep	16 420	17 256	33 676
	DC15: OR Tambo	EC153: Ngquza Hill	128 974	149 507	278 481
		EC154: Port St Johns	71 482	84 654	156 136
		EC155: Nyandeni	134 241	156 149	290 390
		EC156: Mhlonlto	87 440	100 786	188 226
		EC157: King Sabata Dalindyebo	207 951	243 760	451 711
DC44: Alfred Nzo	EC441: Matatiele	93 675	110 168	203 843	
	EC442: Umzimvubu	87 946	103 674	191 620	
	EC443: Mbizana	128 332	153 573	281 905	
	EC444: Ntabankulu	56 534	67 442	123 976	
BUF: Buffalo City	BUF: Buffalo City	358 557	396 643	755 200	
NMA: Nelson Mandela Bay	NMA: Nelson Mandela Bay	552 994	599 121	1 152 115	
Free State	DC16: Xhariep	FS161: Letsemeng	19 852	18 777	38 629
		FS162: Kopanong	24 083	25 087	49 170
		FS163: Mohokare	16 314	17 831	34 145
		FS164: Naledi	11 409	12 905	24 314
	DC18: Lejweleputswa	FS181: Masilonyana	31 961	31 374	63 335
		FS182: Tokologo	14 410	14 576	28 986
		FS183: Tswelopele	22 864	24 761	47 625
		FS184: Matjhabeng	201 509	204 952	406 461
		FS185: Nala	38 867	42 353	81 220
	DC19: Thabo Mofutsanyane	FS191: Setsoto	52 633	59 964	112 597
		FS192: Dihlabeng	61 153	67 551	128 704
		FS193: Nketoana	28 611	31 713	60 324
		FS194: Maluti a Phofung	153 209	182 575	335 784
		FS195: Phumelela	23 162	24 611	47 773
		FS196: Mantsopa	24 402	26 654	51 056
	DC20: Fezile Dabi	FS201: Moqhaka	79 477	81 055	160 532
		FS203: Ngwathe	57 424	63 096	120 520
		FS204: Metsimaholo	77 636	71 472	149 108
		FS205: Mafube	27 805	30 071	57 876
	MAN: Mangaung	MAN: Mangaung	362 186	385 245	747 431

Province	District	Municipality	Male	Female	Total
Gauteng	DC42: Sedibeng	GT421: Emfuleni	354 862	366 800	721 662
		GT422: Midvaal	49 178	46 123	95 301
		GT423: Lesedi	51 317	48 203	99 520
	DC48: West Rand	GT481: Mogale City	184 981	177 441	362 422
		GT482: Randfontein	74 885	74 400	149 285
		GT483: Westonaria	61 152	50 615	111 767
		GT484: Merafong City	107 157	90 363	197 520
	EKU: Ekurhuleni	EKU: Ekurhuleni	1 627 724	1 550 747	3 178 471
JHB: City of Johannesburg	JHB: City of Johannesburg	2 225 137	2 209 690	4 434 827	
TSH: City of Tshwane	TSH: City of Tshwane	1 453 483	1 468 005	2 921 488	
KwaZulu-Natal	DC21: Ugu	KZN211: Vulamehlo	36 062	41 341	77 403
		KZN212: Umdoni	38 294	40 581	78 875
		KZN213: Umzumbe	74 819	86 156	160 975
		KZN214: UMuziwabantu	44 754	51 802	96 556
		KZN215: Ezingoleni	24 101	28 439	52 540
		KZN216: Hibiscus Coast	121 131	135 004	256 135
	DC22: UMgungundlovu	KZN221: uMshwathi	50 484	55 890	106 374
		KZN222: uMngeni	44 849	47 861	92 710
		KZN223: Mpofana	18 487	19 617	38 104
		KZN224: Impendle	15 493	17 612	33 105
		KZN225: The Msunduzi	294 454	324 082	618 536
		KZN226: Mkhambathini	30 270	32 872	63 142
		KZN227: Richmond	31 883	33 910	65 793
	DC23: Uthukela	KZN232: Emnambithi/Ladysmith	111 617	125 820	237 437
		KZN233: Indaka	46 509	56 607	103 116
		KZN234: Umtshezi	38 615	44 538	83 153
		KZN235: Okhahlamba	61 624	70 443	132 067
		KZN236: Imbabazane	52 817	60 256	113 073
	DC24: Umzinyathi	KZN241: Endumeni	31 637	33 225	64 862
		KZN242: Nqutu	75 194	90 113	165 307
		KZN244: Msinga	77 143	100 433	177 576
		KZN245: Umvoti	45 601	57 491	103 092
	DC25: Amajuba	KZN252: Newcastle	172 846	190 390	363 236
		KZN253: Emadlangeni	17 486	16 956	34 442
		KZN254: Dannhauser	48 380	53 781	102 161
	DC26: Zululand	KZN261: eDumbe	38 447	43 605	82 052
		KZN262: UPhongolo	59 728	67 510	127 238
		KZN263: Abaqulusi	100 474	110 586	211 060
		KZN265: Nongoma	88 490	106 418	194 908
		KZN266: Ulundi	85 061	103 255	188 316
	DC27: Umkhanyakude	KZN271: Umhlabuyalingana	71 769	84 967	156 736
		KZN272: Jozini	86 116	100 386	186 502
		KZN273: The Big 5 False Bay	16 505	18 753	35 258
		KZN274: Hlabisa	32 942	38 983	71 925
		KZN275: Mtubatuba	81 314	94 111	175 425
	DC28: Utungulu	KZN281: Mfolozi	59 020	63 869	122 889
		KZN282: uMhlathuze	162 942	171 517	334 459
		KZN283: Ntambanana	34 280	40 057	74 337
		KZN284: uMlalazi	98 407	115 194	213 601
		KZN285: Mthonjaneni	22 102	25 716	47 818
		KZN286: Nkandla	50 647	63 770	114 417
	DC29: ILembe	KZN291: Mandeni	65 332	72 746	138 078
		KZN292: KwaDukuza	114 160	117 028	231 188
		KZN293: Ndwedwe	66 296	74 524	140 820
		KZN294: Maphumulo	43 221	53 503	96 724
DC43: Sisonke	KZN431: Ingwe	46 752	53 795	100 547	
	KZN432: Kwa Sani	6 688	6 210	12 898	
	KZN433: Greater Kokstad	32 032	33 950	65 982	
	KZN434: Ubuhlebezwe	47 246	54 445	101 691	
	KZN435: Umzimkhulu	81 749	98 553	180 302	
ETH: Ethekwini	ETH: Ethekwini	1 682 406	1 759 955	3 442 361	

Province	District	Municipality	Male	Female	Total	
Limpopo	DC33: Mopani	LIM331: Greater Giyani	108 124	136 094	244 218	
		LIM332: Greater Letaba	95 305	117 396	212 701	
		LIM333: Greater Tzaneen	181 558	208 536	390 094	
		LIM334: Ba-Phalaborwa	73 017	77 620	150 637	
		LIM335: Maruleng	43 577	51 280	94 857	
	DC34: Vhembe	LIM341: Musina	34 506	33 853	68 359	
		LIM342: Mutale	41 546	50 324	91 870	
		LIM343: Thulamela	278 650	339 812	618 462	
		LIM344: Makhado	236 795	279 236	516 031	
	DC35: Capricorn	LIM351: Blouberg	74 152	88 476	162 628	
		LIM352: Aganang	59 171	71 992	131 163	
		LIM353: Molemole	49 881	58 440	108 321	
		LIM354: Polokwane	302 233	326 766	628 999	
	DC36: Waterberg	LIM355: Lepele-Nkumpi	104 805	125 545	230 350	
		LIM361: Thabazimbi	49 877	35 357	85 234	
		LIM362: Lephalale	62 819	52 948	115 767	
		LIM364: Mookgopong	18 329	17 310	35 639	
		LIM365: Modimolle	34 686	33 827	68 513	
		LIM366: Bela-Bela	33 754	32 746	66 500	
	DC47: Greater Sekhukhune	LIM367: Mogalakwena	143 702	163 980	307 682	
		LIM471: Ephraim Mogale	58 207	65 442	123 649	
		LIM472: Elias Motsoaledi	115 503	133 860	249 363	
		LIM473: Makhuduthamaga	121 282	153 075	274 357	
		LIM474: Fetakgomo	42 258	51 536	93 794	
	Mpumalanga	DC30: Gert Sibande	LIM475: Greater Tubatse	160 398	175 278	335 676
			MP301: Albert Luthuli	87 188	98 822	186 010
			MP302: Msukaligwa	74 113	75 264	149 377
			MP303: Mkhondo	82 263	89 719	171 982
MP304: Pixley Ka Seme			39 520	43 715	83 235	
MP305: Lekwa			57 647	58 014	115 661	
MP306: Dipaleseng			21 462	20 928	42 390	
DC31: Nkangala		MP307: Govan Mbeki	152 211	142 326	294 537	
		MP311: Victor Khanye	38 816	36 636	75 452	
		MP312: Emalahleni	208 751	186 715	395 466	
		MP313: Steve Tshwete	119 411	110 421	229 832	
		MP314: Emakhazeni	24 099	23 117	47 216	
		MP315: Thembisile	147 676	162 783	310 459	
DC32: Ehlanzeni		MP316: Dr JS Moroka	117 494	132 211	249 705	
		MP321: Thaba Chweu	50 415	47 972	98 387	
		MP322: Mbombela	285 750	303 044	588 794	
		MP323: Umjindi	36 407	33 170	69 577	
	MP324: Nkomazi	184 808	205 802	390 610		
		MP325: Bushbuckridge	246 023	295 224	541 247	

Province	District	Municipality	Male	Female	Total	
Northern Cape	DC6: Namakwa	NC061: Richtersveld	6 300	5 682	11 982	
		NC062: Nama Khoi	23 215	23 826	47 041	
		NC064: Kamiesberg	5 136	5 051	10 187	
		NC065: Hantam	10 809	10 769	21 578	
		NC066: Karoo Hoogland	6 253	6 335	12 588	
		NC067: Khâi-Ma	6 560	5 905	12 465	
	DC7: Pixley ka Seme	NC071: Ubuntu	9 225	9 376	18 601	
		NC072: Umsobomvu	13 689	14 687	28 376	
		NC073: Emthanjeni	20 722	21 634	42 356	
		NC074: Kareeberg	5 755	5 918	11 673	
		NC075: Renosterberg	5 371	5 607	10 978	
		NC076: Thembelihle	7 976	7 724	15 700	
		NC077: Siyathemba	10 759	10 832	21 591	
		NC078: Siyancuma	18 570	18 505	37 075	
	DC8: Siyanda	NC081: Mier	3 599	3 404	7 003	
		NC082: Kai !Garib	34 278	31 591	65 869	
		NC083: //Khara Hais	46 047	47 447	93 494	
		NC084: !Kheis	8 408	8 229	16 637	
		NC085: Tsantsabane	18 363	16 730	35 093	
		NC086: Kgatelopele	9 472	9 215	18 687	
	DC9: Frances Baard	NC091: Sol Plaatjie	120 212	127 829	248 041	
		NC092: Dikgatlong	23 062	23 778	46 840	
		NC093: Magareng	11 732	12 473	24 205	
		NC094: Phokwane	30 491	32 509	63 000	
	DC45: John Taolo Gaetsewe	NC451: Joe Morolong	41 262	48 268	89 530	
		NC452: Ga-Segonyana	44 994	48 658	93 652	
		NC453: Gamagara	22 710	18 907	41 617	
	North West	DC37: Bojanala	NW371: Moretele	91 193	95 755	186 948
			NW372: Madibeng	253 991	223 390	477 381
			NW373: Rustenburg	301 796	247 779	549 575
			NW374: Kgetlengrivier	27 034	24 015	51 049
			NW375: Moses Kotane	120 515	122 038	242 553
		DC38: Ngaka Modiri Molema	NW381: Ratlou	51 310	56 029	107 339
NW382: Tswaing			61 931	62 287	124 218	
NW383: Mafikeng			141 642	149 885	291 527	
NW384: Ditsobotla			85 297	83 605	168 902	
NW385: Ramotshere Moiloa			73 220	77 494	150 714	
DC39: Dr Ruth Segomotsi Mompati		NW392: Naledi	33 502	33 279	66 781	
		NW393: Mamusa	29 941	30 414	60 355	
		NW394: Greater Taung	83 756	93 886	177 642	
		NW396: Lekwa-Teemane	26 600	26 648	53 248	
		NW397: Kagisano/Molopo	50 918	54 870	105 788	
DC40: Dr Kenneth Kaunda		NW401: Ventersdorp	29 246	27 456	56 702	
		NW402: Tlokwe City Council	79 967	82 794	162 761	
		NW403: City of Matlosana	199 364	199 311	398 675	
		NW404: Maquassi Hills	38 680	39 114	77 794	

Province	District	Municipality	Male	Female	Total
Western Cape	DC1: West Coast	WC011: Matzikama	33 624	33 523	67 147
		WC012: Cederberg	24 994	24 774	49 768
		WC013: Bergrivier	30 060	31 837	61 897
		WC014: Saldanha Bay	49 389	49 804	99 193
		WC015: Swartland	56 472	57 290	113 762
	DC2: Cape Winelands	WC022: Witzenberg	59 554	56 392	115 946
		WC023: Drakenstein	123 525	127 737	251 262
		WC024: Stellenbosch	76 176	79 557	155 733
		WC025: Breede Valley	81 067	85 758	166 825
		WC026: Langeberg	47 891	49 834	97 725
	DC3: Overberg	WC031: Theewaterskloof	55 463	53 327	108 790
		WC032: Overstrand	39 786	40 646	80 432
		WC033: Cape Agulhas	16 229	16 808	33 037
		WC034: Swellendam	17 891	18 025	35 916
	DC4: Eden	WC041: Kannaland	11 995	12 772	24 767
		WC042: Hessequa	25 525	27 117	52 642
		WC043: Mossel Bay	43 751	45 679	89 430
		WC044: George	95 310	98 362	193 672
		WC045: Oudtshoorn	45 913	50 021	95 934
		WC047: Bitou	24 468	24 694	49 162
		WC048: Knysna	33 957	34 702	68 659
	DC5: Central Karoo	WC051: Laingsburg	4 134	4 155	8 289
		WC052: Prince Albert	6 496	6 640	13 136
		WC053: Beaufort West	24 137	25 449	49 586
	CPT: City of Cape Town	CPT: City of Cape Town	1 830 699	1 909 327	3 740 026
	South Africa			25 188 786	26 581 767

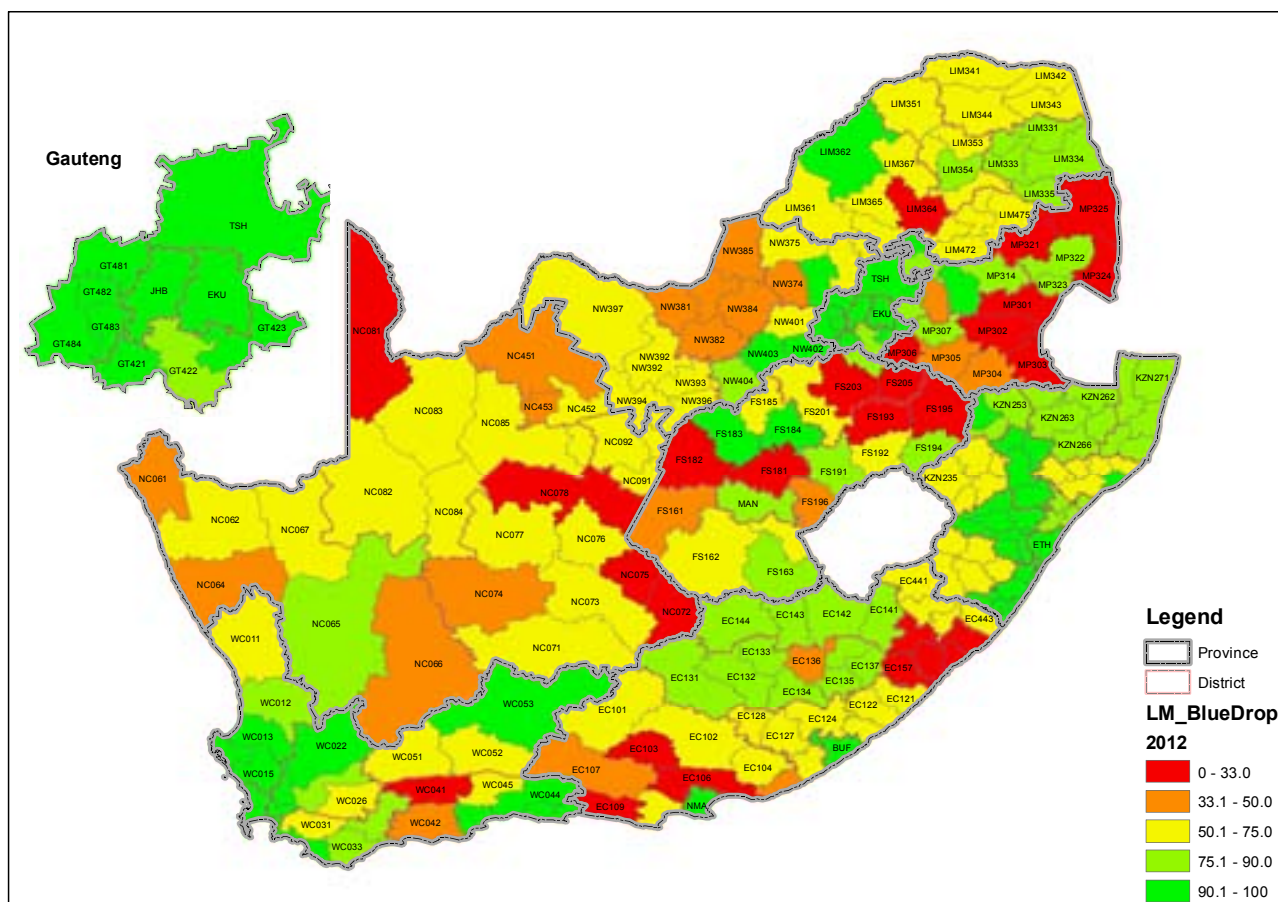
Source: Census 2011.

Colour graphs and maps

The following graphs and maps show provincial/district variation for some key indicators of the National Service Delivery Agreement (NSDA) or national priorities:

- > Socio-economic
 - Map 10: National Blue Drop performance certification results for water service authorities, 2012
- > Child mortality
 - Figure 4: Model estimates of under-5 mortality rate in South Africa compared with the SA MDG target
- > Financing: Medical scheme coverage
 - Figure 5: Ethnicity of people belong to medical schemes, 1980-2010

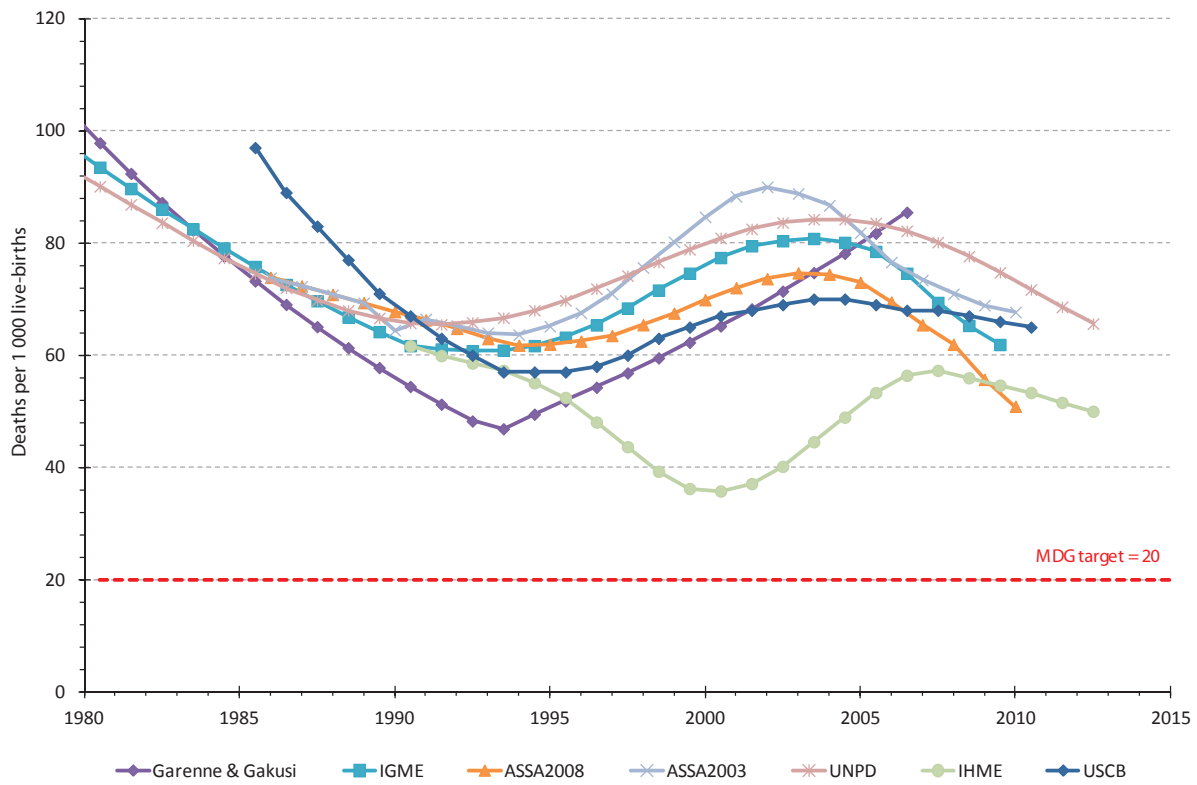
Map 10: National Blue Drop performance certification results for water service authorities, 2012



Source: Adapted from district and sub-district data included in Blue Drop 2012.⁴⁵

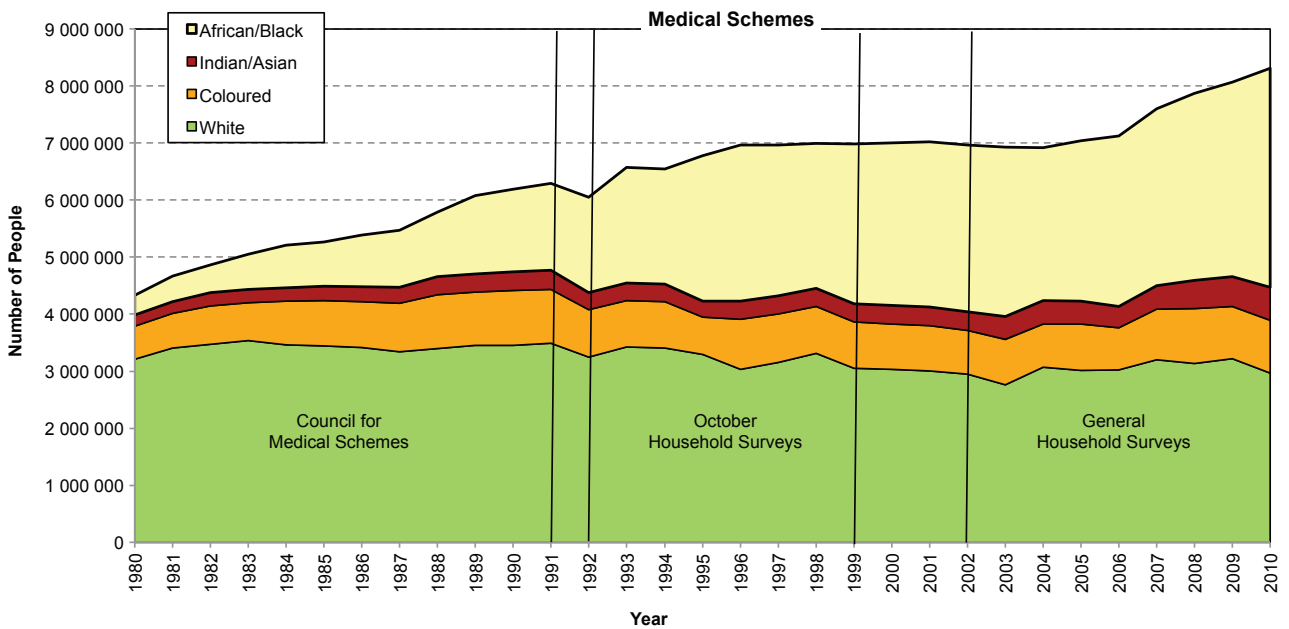
Note: Blue Drop Certification is an indication that a water supply authority has complied with stringent procedural, chemical, biological and other requirements. A score of 100% (green) represents 'Exceptional Drinking Water Quality Management (DWQM)' and implies that the water service institutions comply 100% with all Blue Drop certification criteria. A score of <33.3% (red) represents 'Significant improvement required in DWQM' and is an indication that urgent intervention is required to ensure drastic improvement in DWQM.

Figure 4: Model estimates of under-5 mortality rate in South Africa compared with the SA MDG target



Source: U5MR 2012.¹⁶³

Figure 5: Ethnicity of people belong to medical schemes, 1980-2010



Source: NHI Policy Brief 21.²⁷³

National Indicator Data Set (NIDS) indicators from April 2013

Overview:

Core Health Facility - Monthly	
Child Health	11
Chronic	12
EPI	15
HIV	8
Management Inpatients	5
Management PHC	8
Maternal & Women's Health	27
Nutrition	4
Oral	3
Quality	2
TB	6
TOTAL	101

Count Indicators (listed under Data Elements)	
ART	6
HIV	1
TOTAL	7

Core Health Facility - Quarterly	
ART Baseline	22
ART 3 months - repeated at durations	8
ART 6 months - repeated at durations	4
Quality	1
TB	13
Total	48

Non-Facility Health Services - Monthly	
Environmental Health Services (EHS)	14
Emergency Medical Services (EMS)	8
Integrated School Health Program (ISHP)	15
Ward Based Outreach Team (WBOT)	15
Total	52

NOTE:

- 1 While all school health elements and indicators are essential for monitoring school health services at all levels, only four indicators will be extracted from the DHIS ISHP database at National Level for overall monitoring and reporting purposes.
- 2 While all ward based PHC outreach team (WBOT) elements and indicators are essential for monitoring outreach services at all level, only seven indicators will be extracted from the DHIS WBOT database at National Level for overall monitoring and reporting purposes.

Indicators

Indicator Name	Numerator	Denominator	Definition	Use and context	Type	Freq	Level	Key reports
Management PHC								
PHC utilisation rate under 5 years (annualised)	PHC headcount under 5	Population under 5 years	Average number of PHC visits per year per person under 5 years of age in the population	Monitors PHC access and utilisation by children under 5 years of age	No	Monthly	Output	APP; DHP
PHC utilisation rate (annualised)	PHC headcount total	Population total	Average number of PHC visits per person per year in the population	Monitors PHC access and utilisation	No	Monthly	Output	APP; DHP
PHC uninsured population utilisation rate (annualised)	PHC total headcount	Population uninsured total	Average number of PHC visits per person per year in the uninsured population	Monitors PHC access and utilisation by the uninsured population	No	Monthly	Output	APP; DHP
PHC professional nurse clinical work load	PHC clients seen by professional nurse	PHC professional nurse clinical work days	Average number of clients seen per professional nurse clinical work day	Monitors staff allocation/management and provide indirect indication of quality of patient care. Low work load may be due to inefficient staff utilisation, and very high workload indicates too little time spent per patient. Do not include delivery service time in numerator or denominator	No	Monthly	Input	APP; DHP
PHC doctor clinical work load	PHC clients seen by doctor	PHC doctor clinical work days	Average number of clients seen per doctor per clinical work day	Monitors staff allocation/management and provide indirect indication of quality of client care. Low work load may be due to inefficient staff utilisation, and very high workload indicates too little time spent per client. Do not include delivery service time in numerator or denominator	No	Monthly	Input	APP; DHP
PHC doctor case load	PHC clients seen by doctor	PHC total headcount	Proportion of total PHC clients consulted by doctors	Monitors access to doctors as well as effectiveness of PHC policy implementation and referral system. Replaces indicators for fixed clinics supported by doctor at least once a week and CHCs/CDCs with resident doctor rate from 1 April 2013	%	Monthly	Input	NSDA; NSP; WHO
PHC supervisor visit rate (fixed clinic/CHC/CDC)	PHC supervisor visit (fixed clinic/CHC/CDC)	Fixed clinics plus fixed CHCs/CDCs	Proportion fixed clinics, CHCs and CDCs visited by a dedicated supervisor according to the PHC Supervision Manual	Monitors supervision according to the PHC Supervision manual (once a month) in clinics, CHCs and CDCs	%	Monthly	Process/Activity	APP; DHP
Tracer items stock-out rate (fixed clinic/CHC/CDC)	Any tracer item drug stock-out	Fixed clinics plus fixed CHCs/CDCs	The proportion of all fixed clinics, CHCs and CDCs that had stock-out of ANY tracer item for any period	Monitors effectiveness of drug management	%	Monthly	Process/Activity	
OPD new client not referred rate	OPD headcount not referred new	OPD new clients - total	Proportion of new OPD clients without a referral letter	Monitors utilisation trends of clients by-passing PHC facilities and the effect of PHC re-engineering on OPD utilisation. Do not include OPD follow-up and emergency clients in the denominator	%	Monthly	Output	NSDA
Expenditure per PDE	Expenditure total	Patient day equivalent	Average cost per patient day equivalent (PDE). PDE is the Inpatient days total + Day Patients * 0.5 + (Emergency headcount + OPD headcount total) * 0.33333333	Monitors effective and efficient management of inpatient facilities. Note that multiplied by 0.5 is the same as division by 2, and multiplied by 0.33333333 is the same as division by 3	No	Monthly	Outcome	
Average length of stay - total	Inpatient days + 1/2 Day clients	Inpatient separations	The average number of client days an admitted client spends in hospital before separation. Inpatient separation is the total of day clients, inpatient discharges, inpatient deaths and inpatient transfer outs	Monitors effectiveness and efficiency of inpatient management. Proxy indicator because ideally it should only include inpatient days for those clients separated during the reporting month. Use in all hospitals and CHCs with inpatient beds	Days	Monthly	Outcome	APP; DHP
Inpatient bed utilisation rate - total	Inpatient days + 1/2 Day clients	Inpatient bed days available	Inpatient bed days used as proportion of maximum inpatient bed days available. (Number of inpatient beds X days in period)	Monitors effectiveness and efficiency of inpatient management. Baselines for 2011/12 were DH: 67.1, RH: 76.9, TH:73.6, CH: 75.3	%	Monthly	Outcome	APP; DHP
Inpatient crude death rate	Inpatient deaths - total	Inpatient separations	Proportion of admitted clients/separations who died during hospital stay. Inpatient separations is the total of day clients, inpatient discharges, inpatient deaths and inpatient transfer outs	Monitors trends in inpatient deaths. Provides an indication of the quality of inpatient care	%	Monthly	Outcome	
Management Inpatients								

Indicator Name	Numerator	Denominator	Definition	Use and context	Type	Freq	Level	Key reports	
Quality	Complaint resolution within 25 working days rate	Complaint resolved	Proportion of complaints resolved within 25 working days out of all complaints resolved	Monitors public health system response to customer concerns	%	Monthly	Output	APP; DHP	
	Mortality and Morbidity review rate	Planned mortality and morbidity reviews multiplied by number of disciplines within the facility	Frequency of holding mortality and morbidity reviews that should include, but not limited to, (a) maternal deaths, (b) neonatal deaths, (c) wrong site surgery and (d) anaesthetic death	Demonstrates facility's aim of ensuring quality healthcare service provision. Guideline to be developed to include among other things measures such as c/s infection rate, anaesthetic death rate, maternal and paediatric deaths and wrong site surgery	%	Quarterly	Process/Activity	APP; DHP	
	Complaint resolution rate	Complaint resolved	Proportion of all complaints resolved out of all complaints received	Monitors public health system response to customer concerns	%	Monthly	Output		
Chronic	Cataract surgery rate (annualised)	Cataract surgery total	Clients who had cataract surgery per 1 million population	Monitors access to cataract surgery. A client with surgery on both eyes within a short time period should be counted as one case	per1mill	Monthly	Output	APP	
	Diabetes new client under 18 years detection rate (annualised)	Diabetes client under 18 years new	Newly diagnosed diabetes clients (put on treatment) under 18 years as a proportion of the population under 18 years	Monitoring programme performance, as well as trends, which will inform preventative strategies. To determine the number of clients < 18 years, newly diagnosed with Diabetes, and put on treatment	per1K	Monthly	Process/Activity		
	Diabetes new client 18 years and older detection rate (annualised)	Diabetes client 18 years and older new	Newly diagnosed diabetes clients (put on treatment) 18 years and older as a proportion of the population 18 years and older	Monitoring programme performance, as well as trends, which will inform preventative strategies. To determine the number of clients 18 years and older, newly diagnosed with Diabetes, and put on treatment	per1K	Monthly	Process/Activity		
	Hypertension case load	Hypertension visit	clients who visited health facilities for hypertension care as proportion of total PHC clients (headcount)	Monitors the number of clients who visited the clinic to access treatment for hypertension	%	Monthly	Output	NSDA; NSP; WHO	
	Hypertension incidence (annualised)	Hypertension client treatment new	Population 40 years and older	Newly diagnosed hypertension clients initiated on treatment per 1,000 population 40 years and older	per1K	Monthly	Outcome		
	Diabetes incidence (annualised)	Diabetes client treatment new	Population 40 years and older	Newly diagnosed diabetes clients initiated on treatment per 1,000 population 40 years and older	per1K	Monthly	Outcome		
	Wheelchair issued rate	Wheelchair issued - new	Wheelchair applications	Wheelchairs issued as proportion of applications received and clients added on register for requiring wheelchairs	Monitors access to wheelchairs. Only collect at facilities where wheelchairs are provided	%	Monthly	Output	
	Mental health case load	Mental health clients total	PHC headcount total	Mental health care clients as proportion of total PHC headcount	Monitors access to and utilisation of mental health services	%	Monthly	Process/Activity	NSDA; NSP; WHO
	Mental health visit 18 years and older rate	Mental health client 18 years and older	Mental health clients total	Mental health care client 18 years and older as proportion of total mental health care clients	Monitors trends in mental health care needs and service utilisation of clients 18 years and older	%	Monthly	Process/Activity	
	Mental health admission rate	Mental health admissions total	Inpatient separations total	Proportion of clients admitted/separated for mental health problems. Inpatient separations is the total of day clients, inpatient discharges, inpatient deaths and inpatient transfer outs	Monitors trends in mental health admissions in non-mental health institutions. The data element inpatient separations is used as a proxy for admissions. Monitor in general hospitals only and NOT in mental health institutions	%	Monthly	Output	
Mental health admission 18 years and older rate	Mental health admission 18 years and older	Mental health admissions total	Client 18 years and older admitted for mental health problems as proportion of total mental health clients admitted	Monitors trends in mental health admissions under 18 years of age. Use in general hospitals and mental health institutions	%	Monthly	Output		
Mental health involuntary admission rate	Mental health admission involuntary	Mental health admissions total	Involuntary admissions as proportion of all mental health admissions	Monitors admissions in terms of section 39 of the Regulations to the Mental Health Care Act No 17 of 2002. The data elements should be collected at all hospitals with designated psychiatric beds or wards. Because of long stay, the data element inpatient separations cannot serve as a proxy for admissions in mental health institutions	%	Monthly	Output		

Indicator Name	Numerator	Denominator	Definition	Use and context	Type	Freq	Level	Key reports
Child Health								
Child under 5 years diarrhoea with dehydration incidence (annualised)	Child under 5 years diarrhoea with dehydration new	Population under 5 years	Children under 5 years newly diagnosed with diarrhoea with dehydration per 1,000 children under 5 years in the population	Monitors prevention of diarrhoea with dehydration (IMCI classification) in children under 5 years. Count only once when diagnosed. Follow-up visits for the same episode of diarrhoea should not be counted here	per1K	Monthly	Outcome	
Child under 5 years pneumonia incidence (annualised)	Child under 5 years with pneumonia new	Population under 5 years	Children under 5 years newly diagnosed with pneumonia per 1,000 children under 5 years in the population	Monitors prevention and diagnosis of pneumonia (IMCI definition) in children under 5 years. Count only once when diagnosed. Follow-up visits for the same episode of pneumonia should not be counted here	per1K	Monthly	Outcome	NSDA
Child under 5 years severe acute malnutrition incidence (annualised)	Child under 5 years with severe acute malnutrition new	Population under 5 years	Children under 5 years newly diagnosed with severe acute malnutrition per 1,000 children under 5 years in the population	Monitors prevention and diagnosis of severe acute malnutrition in children under 5 years. Count only once when diagnosed. Follow-up visits for the same episode of malnutrition should not be counted here	per1K	Monthly	Outcome	NSDA
Child under 5 years diarrhoea case fatality rate	Child under 5 years with diarrhoea death	Child under 5 years with diarrhoea admitted	Proportion of children under 5 years admitted with diarrhoea who died	Monitors treatment outcome for children under 5 years who were admitted with diarrhoea. Include under 1 year diarrhoea deaths	%	Monthly	Impact	
Child under 5 years pneumonia case fatality rate	Child under 5 years pneumonia death	Child under 5 years pneumonia admitted	Proportion of children under 5 years admitted with pneumonia who died	Monitors treatment outcome for children under 5 years who were admitted with pneumonia. Includes all children under 5 years who died of pneumonia	%	Monthly	Impact	
Child under 5 years severe acute malnutrition case fatality rate	Child under 5 years severe acute malnutrition death	Child under 5 years severe acute malnutrition admitted	Proportion of children under 5 years admitted with severe acute malnutrition who died	Monitors treatment outcome for children under 5 years who were admitted with severe acute malnutrition. Includes under 1 year severe acute malnutrition deaths as defined in the IMCI guidelines	%	Monthly	Impact	
Child under 1 year mortality in facility rate (annualised)	Inpatient death under 1 year	Population estimated live births	Admitted children under 1 year of age who died per estimated 1,000 live births. Estimated live births in population is calculated by multiplying estimated population under 1 year by 1.03 to compensate for infant mortality	Includes neonatal deaths. Estimated live births in population is calculated by multiplying estimated population under 1 year by 1.03 to compensate for infant mortality. This indicator will be useful at national, provincial and district levels	per1K	Monthly	Impact	MDG; NSDA
Child under 5 years mortality in facility rate (annualised)	Inpatient death under 5 years	Population estimated live births	Admitted children under 5 years who died per estimated 1,000 live births. Estimated live births in population is calculated by multiplying estimated population under 1 year by 1.03 to compensate for infant mortality	Includes under 1 year deaths. Estimated live births in population is calculated by multiplying estimated population under 1 year by 1.03 to compensate for infant mortality. This indicator will be useful at national, provincial and district levels	per1K	Monthly	Impact	MDG; NSDA
Deworming 12-59 months coverage (annualised)	Child 12-59 months dewormed	Population 12-59 months (multiplied by 2)	Proportion of children 12-59 months who received deworming medication every six months	Monitors deworming in children aged 12-59 months	%	Monthly	Output	
Inpatient death under 1 year rate	Inpatient death under 1 year	Inpatient separations under 1 year	Proportion of children under 1 year admitted/separated who died during their stay in the facility. Inpatient separations under 1 year is the total of inpatient discharges, inpatient deaths and inpatient transfer outs	Monitors treatment outcome for admitted children under 1 year. Includes neonatal deaths	%	Monthly	Impact	
Inpatient death under 5 year rate	Inpatient death under 5 years	Inpatient separations under 5 years	Proportion of children under 5 years admitted/separated who died during their stay in the facility. Inpatient separations under 5 years is the total of inpatient discharges, inpatient deaths and inpatient transfer outs	Monitors treatment outcome for admitted children under 5 years. Includes under 1 year deaths	%	Monthly	Impact	

Indicator Name	Numerator	Denominator	Definition	Use and context	Type	Freq	Level	Key reports
BCG dose coverage (annualised)	BCG dose	Population under 1 year	Proportion children under 1 year who received BCG, normally given just after birth	Monitors BCG vaccination to protect children against miliary TB and TB meningitis. Vaccines given as part of mass vaccination campaigns should not be counted here	%	Monthly	Output	WHO
OPV 1st dose coverage (annualised)	OPV 1st dose	Population under 1 year	Proportion children under 1 year who received OPV 1st dose, normally at 6 weeks	Monitors protection of children against polio. Vaccines given as part of mass vaccination campaigns should not be counted here	%	Monthly	Output	WHO
DTaP-IPV/Hib 1st dose coverage (annualised)	DTaP-IPV/Hib 1st dose	Population under 1 year	Proportion children under 1 year who received DTaP-IPV/Hib (Pentaxim) 1st dose, normally at 6 weeks	Monitors protection of children against diphtheria, tetanus, a-cellular pertussis, polio and Haemophilus influenzae. Vaccines given as part of mass vaccination campaigns should not be counted here	%	Monthly	Output	WHO
DTaP-IPV/Hib 3rd dose coverage (annualised)	DTaP-IPV/Hib 3rd dose	Population under 1 year	Proportion children under 1 year who received DTaP-IPV/Hib (Pentaxim) 3rd dose, normally at 14 weeks	Monitors protection of children against diphtheria, tetanus, a-cellular pertussis, polio and Haemophilus influenzae. Vaccines given as part of mass vaccination campaigns should not be counted here	%	Monthly	Output	WHO; HADACC
PCV 3rd dose coverage (annualised)	PCV 3rd dose	Population under 1 year	Proportion children under 1 year who received PCV 3rd dose, normally at 9 months	Monitors protection of children against pneumococcal disease. Vaccines given as part of mass vaccination campaigns should not be counted here	%	Monthly	Output	WHO
RV 2nd dose coverage (annualised)	RV 2nd dose	Population under 1 year	Proportion children under 1 year who received RV 2nd dose, normally at 14 weeks but NOT later than 24 weeks	Monitors protection of children against rota virus. Vaccines given as part of mass vaccination campaigns should not be counted here	%	Monthly	Output	WHO; HADACC
DTaP-IPV/Hib 4th dose coverage (annualised)	DTaP-IPV/Hib 4th dose	Population 1 year	Proportion children aged 1 year who received DTaP-IPV/Hib (Pentaxim) 4th dose, normally at 18 months	Monitors protection of children against diphtheria, tetanus, a-cellular pertussis, polio and Haemophilus influenzae. Vaccines given as part of mass vaccination campaigns should not be counted here	%	Monthly	Output	WHO
HepB 3rd dose coverage (annualised)	HepB 3rd dose	Population under 1 year	Proportion children under 1 year who received HepB 3rd dose, normally at 14 weeks	Monitors protection of children against Hepatitis B. Vaccines given as part of mass vaccination campaigns should not be counted here	%	Monthly	Output	WHO
Measles 1st dose under 1 year coverage (annualised)	Measles 1st dose under 1 year	Population under 1 year	Proportion children under 1 year who received measles 1st dose, normally at 9 months	Monitors protection of children under 1 year of age against measles. Vaccines given as part of mass vaccination campaigns should not be counted here	%	Monthly	Output	MDG
Immunisation coverage under 1 year (annualised)	Immunised fully under 1 year new	Population under 1 year	Proportion children under 1 year who completed their primary course of immunisation	The child should only be counted ONCE as fully immunised when receiving the last vaccine in the course (usually the 1st measles and PCV3 vaccines) AND if there is documented proof of all required vaccines (BCG, OPV1, DTaP-IPV/Hib 1, 2, 3, HepB 1, 2, 3, PCV 1,2,3, RV 1,2 and measles 1) on the Road to Health Card/Booklet AND the child is under 1 year old	%	Monthly	Output	APP
DTaP-IPV/Hib 3 - Measles 1st dose drop-out rate	DTaP-IPV/ Hib3 to Measles 1st dose drop-out	DTaP-IPV/ Hib 3rd dose	Proportion children who dropped out of the immunisation schedule between DTaP-IPV/JPV Hib 3rd dose, normally at 14 weeks and measles 1st dose, normally at 9 months	Monitors children who drops out of the vaccination program after 14 week vaccination. Vaccines given as part of mass vaccination campaigns should not be counted here	%	Monthly	Outcome	
Measles 2nd dose coverage (annualised)	Measles 2nd dose	Population 1 year	Proportion of children 1 year (12-23 months) who received measles 2nd dose, normally at 18 months	Monitors protection of children against measles. Because the 1st measles dose is only around 85% effective the 2nd dose is important as a booster. Vaccines given as part of mass vaccination campaigns should not be counted here	%	Monthly	Output	APP
Immunisation at 6 weeks consistency ratio	Immunisation at 6 weeks with identical OPV1 and DTaP-IPV/Hib1 values	Count of facilities giving 6 weeks immunisations	Immunisation at 6 weeks data with identical values for OPV1 and DTaP-IPV/Hib1 as a proportion of all facilities reporting one or both vaccines given. NOTE: The numerator formula is to be expanded with an IIF function that returns 1 when the two data element values are consistent and a 0 otherwise	Monitors to what degree children are getting all required doses simultaneously as per the primary course of immunisation protocol	%	Monthly	Data Quality	
Immunisation at 9 month consistency ratio	Immunisation at 9 month with identical measles1 and PCV3 values	Count of facilities giving 9 months immunisations	Immunisation at 9 months data with identical values for measles 1 and PCV3 as a proportion of all facilities reporting one or both vaccines given. NOTE: The numerator formula is to be expanded with an IIF function that returns 1 when the two data element values are consistent and a 0 otherwise	Monitors to what degree children are getting all required doses simultaneously as per the primary course of immunisation protocol	%	Monthly	Data Quality	
Td dose coverage at 6 years (annualised)	Td dose at 6 years	Population 6 years	Proportion children 6 years of age who received Td booster dose	Monitors protection of children against tetanus and diphtheria, including vaccinations done at schools. Vaccines given as part of mass vaccination campaigns should not be counted here	%	Monthly	Output	

Indicator Name	Numerator	Denominator	Definition	Use and context	Type	Freq	Level	Key reports
Nutrition								
Vitamin A 12-59 months coverage (annualised)	Vitamin A 12-59 months	Population 12-59 months (multiplied by 2)	Proportion of children 12-59 months who received vitamin A 200,000 units every six months	Monitors vitamin A supplementation to children aged 12-59 months. The denominator is multiplied by 2 because each child should receive supplementation twice a year	%	Monthly	Output	APP
Child under 2 years underweight for age incidence (annualised)	Child under 2 years underweight - new (weight between -2 SD and -3 SD new)	Population under 2 years	Children under 2 years newly diagnosed as underweight (weight between -2 and -3 Standard Deviations) per 1,000 children under 2 years in the population	Monitors prevention of malnutrition during 1,000 days between start of pregnancy and second birthday. Count only once when diagnosed. Follow-up visits for the same episode of underweight should not be counted	perK	Monthly	Outcome	NSDA
Child under 5 years food supplementation coverage (annualised)	Child under 5 years on food supplementation new	Population under 5 years	Children under 5 years newly started on food supplementation as proportion of population under 5 years	Monitors access to and efficient use of food supplementation in children under 5 years of age. Around 2% of children under 5 are underweight and need food supplementation	%	Monthly	Input	
Infant exclusively breastfed at HepB 3rd dose rate	Infant exclusively breastfed at HepB 3rd dose	HepB 3rd dose	Proportion infants reported exclusively breastfed at 14 weeks Hepatitis B 3rd dose vaccination	Monitors infant feeding practices at 14 weeks to identify where community interventions need to be strengthened	%	Monthly	Outcome	
Antenatal 1st visit before 20 weeks rate	Antenatal 1st visit before 20 weeks	Antenatal 1st visit total	Women who have a booking visit (first visit) before they are 20 weeks (about half way) into their pregnancy as proportion of all antenatal 1st visits	Monitors early utilisation of antenatal services	%	Monthly	Process/Activity	APP
Antenatal 1st visit coverage (annualised)	Antenatal 1st visit total	Population estimated pregnant women (at ~10 weeks)	The proportion of potential antenatal clients coming for at least one (booking) antenatal visit. The census number of children under one year factorised by 1.15 is used as a proxy denominator - the extra 0.15 (15%) is a rough estimate to cater for late miscarriages (~10 to 26 w), still births (after 26 weeks gestation) and infant mortality. Pregnant women are regarded as potential antenatal clients from around 10 weeks gestation, i.e. spontaneous abortions before that as well as TOP cases are excluded	Monitors access to and utilisation of antenatal services	%	Monthly	Process/Activity	APP
Antenatal client HIV 1st test positive rate	Antenatal client HIV 1st test positive	Antenatal client HIV 1st test	Antenatal clients tested HIV positive as proportion of antenatal clients HIV tested for the first time during current pregnancy	Monitors trends in HIV test positivity of antenatal clients	%	Monthly	Outcome	DORA; NSP; GAR; UA
Antenatal client HIV re-test at 32 weeks or later rate	Antenatal client HIV re-test at 32 weeks or later	Antenatal client HIV 1st test negative	Antenatal clients re-tested for HIV at 32 weeks gestation (or later) as proportion of antenatal clients tested negative for 1st HIV tests done during current pregnancy	Monitors implementation of PMTCT guidelines in terms of HIV re-testing at 32 weeks gestation. Used as a proxy indicator as it is not cost effective to monitor cohorts with paper-based systems	%	Monthly	Process/Activity	DORA; NSP; GAR; UA; HADACC:36
Antenatal client HIV re-test positive at 32 weeks or later rate	Antenatal client HIV re-test positive at 32 weeks or later	Antenatal client HIV re-test at 32 weeks or later	Antenatal clients re-tested positive for HIV at 32 weeks gestation (or later) as proportion of antenatal clients re-tested for HIV at 32 weeks (or later)	Monitors HIV infection during pregnancy	%	Monthly	Outcome	DORA; NSP; GAR; UA
Antenatal client CD4 1st test rate	Antenatal client CD4 1st test	Antenatal client eligible for CD4 1st test	HIV positive antenatal clients CD4 tested for the first time during current pregnancy as proportion of antenatal clients eligible for first CD4 tests	Monitors implementation of PMTCT guidelines in terms of CD4 1st testing	%	Monthly	Output	DORA; NSP; GAR; UA
Antenatal client initiated on AZT during antenatal care rate	Antenatal client INITIATED on AZT	Antenatal client eligible for AZT	HIV positive antenatal clients initiated on AZT during antenatal care as proportion of antenatal clients eligible for AZT	Monitors implementation of PMTCT guidelines in terms of AZT initiation and access to AZT	%	Monthly	Output	DORA; NSP; GAR; UA
Antenatal client PMTCT rate	Antenatal client on PMTCT	Antenatal client HIV positive total	Antenatal clients on PMTCT as a proportion of the total number of antenatal clients who are HIV positive	Monitors access and effectiveness of PMTCT services. Antenatal clients on PMTCT include those initiated on AZT, those initiated on ART and those who were on ART at antenatal 1st visits	%	Monthly	Process/Activity	HADACC:36
Antenatal client initiated on ART rate	Antenatal client initiated on ART	Antenatal client eligible for ART	HIV positive antenatal clients initiated on ART as proportion of HIV positive antenatal clients with CD4 counts under the specified threshold and/or WHO staging of 4	Monitors implementation of PMTCT guidelines in terms of ART initiation	%	Monthly	Process/Activity	DORA; NSP; GAR; UA
Maternal and Women's Health								

Indicator Name	Numerator	Denominator	Definition	Use and context	Type	Freq	Level	Key reports
Antenatal client delivering on ART ratio	Antenatal client on ART at delivery	Live birth to HIV positive woman	HIV positive antenatal clients on ART for any period before labour as proportion of live births to HIV positive women	Monitors proportion new-born infants protected against HIV by ART during pregnancy. This data is collected at point of delivery only and NOT during antenatal care	%	Monthly	Output	DORA; NSP; GAR; UA
Infant given NVP within 72 hours after birth uptake rate	Infant given NVP within 72 hours after birth	Live birth to HIV positive woman	Babies given NVP within 72 hours of birth as proportion of live births to HIV positive women	Monitors implementation of the PMTCT guidelines in terms of NVP for HIV exposed babies	%	Monthly	Output	DORA; NSP; GAR; UA
Born alive before arrival at facility rate	Born alive before arrival at facility	Total births in facility	Infants born alive before arrival at health facilities with no supervision as a proportion of total births	Monitors trends in poor access to delivery facilities mainly caused by inadequate transport and/or poor infrastructure	per1K	Monthly	Outcome	
Cervical cancer screening coverage (annualised)	Cervical cancer screening in woman 30 years and older	Population 30 years and older female / 10	Cervical smears in women 30 years and older as a proportion of 10% of the female population 30 years and older	Monitors implementation of policy on cervical screening	%	Monthly	Process/Activity	
Couple year protection rate (annualised)	Contraceptive years dispensed	Population 15-44 years female	Women protected against pregnancy by using modern contraceptive methods, including sterilisations, as proportion of female population 15-44 year. Contraceptive years are the total of (Oral pill cycles / 13) + (Medroxyprogesterone injection / 4) + (Norethisterone enanthate injection / 6) + (IUCD x 4) + (Male condoms distributed / 200) + (Male sterilisation x 20) + (Female sterilisation x 10)	Monitors access to and utilisation of modern contraceptives to prevent unplanned pregnancies. Serves as proxy for the indicator contraceptive prevalence rate by monitoring trends between official surveys	%	Monthly	Outcome	
Delivery by caesarean section rate	Delivery by caesarean section	Delivery in facility total	Delivery by caesarean section as proportion of total deliveries in health facilities	Monitors access to caesarean section (and other surgery) as well as use of resources at delivery facilities. Differs between types of hospitals, for example 2011/12 values for DH:15 % RH:25 % TH: 30% CH: 50 %.	%	Monthly	Output	
Delivery in facility rate (annualised)	Delivery in facility total	Population estimated deliveries	Deliveries in health facilities as proportion of expected uninsured deliveries in the population. Expected deliveries are estimated as population under 1 year multiplied by 1.025 to compensate for still births and infant mortality	Monitors accessibility of maternity and obstetric services. Born Before Arrivals (BBAs) are not included here	%	Monthly	Outcome	APP
Delivery in facility under 18 years rate	Delivery in facility to woman under 18 years	Delivery in facility total	Deliveries to women under the age of 18 years as proportion of total deliveries in health facilities	Monitors success in prevention of teenage pregnancies	%	Monthly	Outcome	MDG; NSDA
Infant initiated on CPT within 2 months uptake rate	Infant initiated on CPT within 2 months	Live birth to HIV positive woman	Infants initiated on CPT within 2 months after birth (to prevent opportunistic infections) as proportion of live births to HIV positive women	Monitors implementation of the PMTCT guidelines in terms of Co-Trimoxazole prophylaxis (CPT) for HIV exposed infants	%	Monthly	Output	DORA; NSP; GAR; UA
Infant 1st PCR test within 2 months uptake rate	Infant 1st PCR test within 2 months	Live birth to HIV positive woman	Infants PCR tested for the first time within 2 months after birth as proportion of live births to HIV positive women	Monitors implementation of PMTCT guidelines in terms of PCR testing of HIV exposed infants within 2 months. Babies PCR tested for the first time between 4 and 8 weeks must be included. Do NOT include repeat tests. Used as a proxy indicator as it is not cost effective to monitor cohorts with paper-based systems	%	Monthly	Output	DORA; NSP; GAR; UA
Infant 1st PCR test positive within 2 months rate	Infant 1st PCR test positive within 2 months	Infant 1st PCR test within 2 months	Infants tested PCR positive for the first time within 2 months after birth as proportion of infants PCR tested within 2 months	Monitors positivity in HIV exposed infants within 2 months	%	Monthly	Outcome	DORA; NSP; GAR; UA; APP
Live birth under 2500g in facility rate	Live birth under 2500g in facility	Live birth in facility	Infants born alive weighing less than 2500g as proportion of total infants born alive in health facilities (Low birth weight)	Monitors trends in low birth weight	%	Monthly	Outcome	
Still birth in facility rate	Still birth in facility	Total births in facility	Infants born still as proportion of total infants born in health facilities	Monitors still birth trends	%	Monthly	Impact	
Inpatient early neonatal death rate	Inpatient death early neonatal	Live birth in facility	Early neonatal deaths as proportion of infants who were born alive in health facilities	Monitors trends in early neonatal deaths in health facilities. Indication of health system results in terms of antenatal, delivery and early neonatal care	%	Monthly	Impact	MDG; NSDA

Indicator Name	Numerator	Denominator	Definition	Use and context	Type	Freq	Level	Key reports
Neonatal mortality in facility rate (annualised)	Inpatient death early neonatal	Population estimated live births	Inpatient deaths within the first 28 days of life per 1,000 estimated live births. Estimated live births in population is calculated by multiplying estimated population under 1 year by 1.03 to compensate for infant mortality	Proxy indicator for the population based Neonatal Mortality Rate. Monitors trends in neonatal mortality in health facilities between official surveys. Indication of health system results in terms of antenatal, delivery and neonatal care	per1K	Monthly	Impact	MDG; NSDA
Maternal mortality in facility ratio (annualised)	Maternal death in facility	Live birth in facility	Women who died in hospital as a result of childbearing, during pregnancy or within 42 days of delivery or termination of pregnancy, per 100,000 live births in facility	This is a proxy for the population-based maternal mortality ratio, aimed at monitoring trends in health facilities between official surveys. Focuses on obstetric causes (around 30% of all maternal mortality). Provides indication of health system results in terms of prevention of unplanned pregnancies, antenatal care, delivery and postnatal services	per100K	Monthly	Impact	MDG; NSDA
Mother postnatal visit within 6 days rate	Mother postnatal visit within 6 days after delivery	Delivery in facility total	Mothers who received postnatal care within 6 days after delivery as proportion of deliveries in health facilities	Monitors access to and utilisation of postnatal services. May be more than 100% in areas with low delivery in facility rates if many mothers who delivered outside health facilities used postnatal visits within 6 days after delivery	%	Monthly	Process/Activity	APP
Termination of pregnancy rate (annualised)	Termination of pregnancy performed	Population estimated pregnant women (at ~10 weeks)	Pregnancies terminated in health facilities as proportion of all expected pregnancies in population. Expected pregnancies in population is calculated by multiplying estimated population under 1 year by 1.15 to compensate for still births and infant mortality	Monitors access to and utilisation of TOP services. High TOP rates may also indicate that contraceptive services are inadequate	%	Monthly	Output	
TB AFB sputum result turn-around time under 48 hours rate	TB sputum result received within 48 hours	TB AFB sputum sample sent	Proportion TB Acid Fast Bacilli (AFB) results received within 48 hours	Monitors TB AFB sputum results received by facility (SMS or printed report) within 48 hours from when specimen was collected. Include pre-treatment and follow-up specimens. EXCLUDE samples sent for culture and sensitivity	%	Monthly	Process/Activity	
TB smear positive rate	TB sputum test positive	TB suspect 5 years and older sputum sent	Proportion of TB suspects with smear positive sputum results	Monitors early detection of pulmonary TB patients for early initiation of treatment	%	Monthly	Input	NSDA; NSP; WHO
TB suspect sputum test rate	TB suspect 5 years and older with sputum sent	TB suspect 5 years and older	Proportion of TB suspects with sputum sent to the laboratory for testing	Monitors TB screening and suspect testing. TB suspect is a person (PHC headcount 5 years and older), with a cough of more than 2 weeks	%	Monthly	Outcome	NSDA; NSP; WHO
TB suspect treatment initiation rate	TB suspect initiated on treatment	TB suspect test positive	Proportion of smear positive TB suspects initiated on treatment	Monitors early initiation of treatment for pulmonary TB	%	Monthly	Output	NSDA; NSP; WHO
TB treatment initiation rate (annualised)	TB client initiated on treatment	Population total	Proportion TB positive patients initiated on treatment. Also referred to as TB registration rate	Monitors TB treatment initiation. This excludes those patients who were diagnosed with TB but not started on treatment. It includes all patients who were started on TB treatment and subsequently confirmed as MDR-TB during treatment	per100K	Quarterly	Output	NSDA; NSP; WHO
Child contact under 5 years IPT uptake rate	TB contact under 5 years initiated on IPT	TB asymptomatic contact under 5	Proportion asymptomatic TB contacts under 5 years initiated on IPT	Monitors TB preventive therapy in children under 5 years	%	Monthly	Output	NSP
TB/HIV co-infected patient on ART at completion of TB treatment rate	TB/HIV co-infected client on ART at completion of TB treatment	TB/HIV co-infected clients registered	Proportion TB/HIV co-infected patients on ART at completion of TB treatment	Monitors ART initiation in TB/HIV co-infected patients	%	Quarterly	Outcome	NSDA; NSP; WHO
TB client HIV positive rate	TB client HIV positive	TB client (new pulmonary) initiated on treatment	Proportion new TB patients who were HIV positive on initiation of TB treatment	Monitors TB/HIV co-infection trends	%	Quarterly	Input	NSDA; NSP; WHO
TB (pulmonary) case finding index	TB suspect 5 years and older sputum sent	PHC headcount 5 years and older	Proportion of patients 5 years and older, who were identified as TB suspects and for whom sputum was sent to the laboratory	Monitors trends in early identification of TB suspects in health care facilities	%	Monthly	Process/Activity	NSDA; NSP; WHO
TB (new pulmonary) cure rate	TB (new pulmonary) client cured	TB client (new pulmonary) initiated on treatment	Proportion new TB smear positive and culture positive (pulmonary TB) clients cured	Monitors cure of new pulmonary TB clients	%	Quarterly	Outcome	NSDA; NSP; WHO

TB

Indicator Name	Numerator	Denominator	Definition	Use and context	Type	Freq	Level	Key reports
TB (new pulmonary) defaulter rate	TB (new pulmonary) treatment defaulter	TB client (new pulmonary) initiated on treatment	Proportion new smear positive (pulmonary) TB clients who defaulted treatment	Monitors TB clients who do not take their treatment as prescribed	%	Quarterly	Outcome	NSDA; NSP; WHO
TB MDR confirmed treatment initiation rate	TB MDR confirmed client initiated on treatment	TB MDR confirmed new client	Proportion confirmed new MDR-TB patients initiated on treatment	Monitors treatment of MDR TB patients	%	Quarterly	Output	NSDA; NSP; WHO
TB MDR death rate	TB MDR client death during treatment	TB MDR confirmed client initiated on treatment	Proportion MDR-TB patients who died during treatment period	Monitors death during MDR TB treatment period. The cause of death may not necessarily be due to TB	%	Quarterly	Impact	NSDA; NSP; WHO
TB MDR treatment success rate	TB MDR client successfully treated	TB MDR confirmed client initiated on treatment	Proportion MDR-TB patients successfully treated (cured and completed treatment)	Monitors success of MDR TB treatment	%	Quarterly	Outcome	NSDA; NSP; WHO
TB XDR confirmed treatment initiation rate	TB XDR confirmed client initiated on treatment	TB XDR confirmed new client	Proportion confirmed new XDR-TB patients initiated on treatment	Monitors treatment of XDR TB patients	%	Quarterly	Output	NSDA; NSP; WHO
TB XDR death rate	TB XDR client death during treatment	TB XDR confirmed client initiated on treatment	Proportion XDR-TB patients who died during treatment period	Monitors death during XDR TB treatment period. The cause of death may not necessarily be due to TB	%	Quarterly	Impact	NSDA; NSP; WHO
TB XDR treatment success rate	TB XDR client successfully treated	TB XDR confirmed client initiated on treatment	Proportion XDR-TB patients successfully treated (cured and completed treatment)	Monitors success of XDR TB treatment	%	Quarterly	Outcome	NSDA; NSP; WHO
TB new client treatment success rate	TB client cured and completed treatment	TB client (new pulmonary) initiated on treatment	Proportion TB patients (ALL types of TB) cured plus those who completed treatment	Monitors success of TB treatment for ALL types of TB	%	Quarterly	Outcome	NSDA; NSP; WHO
TB death rate	TB client death during treatment	TB client (new pulmonary) initiated on treatment	Proportion TB patients who died during treatment period	Monitors death during TB treatment period. The cause of death may not necessarily be due to TB. NSP-52 target is 50% reduction from 7.1%	%	Quarterly	Impact	NSDA; NSP; WHO
Dental utilisation rate (annualised)	Dental headcount total	Population uninsured total	Dental visits per 1,000 uninsured population	Monitors access to dental/oral health services. Each person should visit a dentist at least once a year	per1K	Monthly	Output	
Dental extraction to restoration ratio	Tooth extraction	Tooth restoration	The ratio between the number of teeth extracted and the number of teeth restored	Monitors overall quality of dental services. Poor quality dental services if many extractions and few restorations	No	Monthly	Output	
Dental - tooth fissure sealant rate (child)	Tooth fissure sealant 1st or 2nd permanent molar (child)	Tooth eruption 1st and 2nd molar (child)	Proportion of children with 1st or 2nd erupting permanent molars sealed by an Oral Health worker as proportion of children with 1st and 2nd molar eruptions	Monitors preventive interventions by oral health workers. 1st and 2nd molars usually erupt at age 6 and 12 respectively. Count each child and not the number of teeth sealed	%	Monthly	Output	
Female condom distribution rate (annualised)	Female condoms distributed	Population 15 years and older female	The number of female condoms distributed per female 15 years and older via the facility or via factories, offices, restaurants, NGOs or other outlets	Monitors distribution of female condoms for prevention of HIV and other STIs, and for contraceptive purposes	No	Monthly	Output	NSP
Male condom distribution rate (annualised)	Male condoms distributed	Population 15 years and older male	Number of male condoms distributed to clients via the facility or via factories, offices, restaurants, NGOs or other outlets - per male 15 years and older	Monitors distribution of male condoms for prevention of HIV and other STIs, and for contraceptive purposes. Note that research indicates only around 60% of distributed condoms are used for the intended purpose	No	Monthly	Output	NSP
HIV positive new client initiated on IPT rate	HIV positive client initiated on IPT	HIV positive client eligible for IPT	Proportion of eligible clients initiated on IPT	Monitors initiation of isoniazid preventive therapy (IPT) to prevent TB	%	Monthly	Process/Activity	APP; NSP
HIV testing coverage (annualised)	HIV test client 15-49 years	Population 15-49 years	Clients HIV tested as proportion of population 15-49 years	Monitors annual testing of persons 15-49 years who are not known HIV positive	%	Monthly	Process/Activity	NSP; APP
TB/HIV co-infected client initiated on ART rate	HIV/TB co-infected client started on ART	HIV/TB co-infected client total	Proportion of TB/HIV co-infected clients initiated on ART	Monitors TB/HIV co-infection at point of ART initiation	%	Monthly	Process/Activity	APP

Oral Health

Indicator Name	Numerator	Denominator	Definition	Use and context	Type	Freq	Level	Key reports
HIV/TB co-infected client initiated on CPT rate	HIV/TB co-infected client started on CPT	HIV/TB co-infected client total	Proportion of TB/HIV co-infected clients initiated on co-trimoxazole prophylaxis therapy (CPT)	Monitors CPT initiation for TB/HIV co-infected clients to prevent opportunistic infections	%	Monthly	Process/Activity	APP
Sexual assault prophylaxis rate	Sexual assault prophylaxis new	Sexual assault cases new	Proportion of sexual assault cases who received post-exposure prophylaxis	Monitors HIV prophylaxis access for people who were sexually assaulted (rape survivors)	%	Monthly	Output	
STI treated new episode incidence (annualised)	STI treated new episode	Population 15 years and older	Proportion of people 15 years and older treated for a new episode of STI (annualised)	Monitors treatment of STIs, which include HIV and more than 20 disease-causing organisms and syndromes, of which some also can cause cancer (NSP 2012/2016:7)	per1K	Monthly	Output	
School ISHP coverage (annualised)	Schools with any learner screened	Schools - total	Proportion of schools in which the ISHP service package was provided	Monitors implementation of the Integrated School Health Program (ISHP)	%	Monthly	Process/Activity	APP, NSDA
School learner screening coverage (annualised)	School learners screened	School learners - total	Proportion of all learners screened by a nurse in line with the ISHP service package	Monitors implementation of the Integrated School Health Program (ISHP)	%	Monthly	Process/Activity	APP
School Grade 1 screening coverage (annualised)	School Grade 1 learners screened	School Grade 1 learners - total	Proportion of Grade 1 learners screened by a nurse in line with the ISHP service package	Monitors implementation of the Integrated School Health Program (ISHP)	%	Monthly	Process/Activity	APP
School Grade 4 screening coverage (annualised)	School Grade 4 learners screened	School Grade 4 learners - total	Proportion of Grade 4 learners screened by a nurse in line with the ISHP service package	Monitors implementation of the Integrated School Health Program (ISHP)	%	Monthly	Process/Activity	
School Grade 8 screening coverage (annualised)	School Grade 8 learners screened	School Grade 8 learners - total	Proportion of Grade 8 learners screened by a nurse in line with the ISHP service package	Monitors implementation of the Integrated School Health Program (ISHP)	%	Monthly	Process/Activity	APP
School Grade 10 screening coverage (annualised)	School Grade 10 learners screened	School Grade 10 learners - total	Proportion of Grade 10 learners screened by a nurse in line with the ISHP service package	Monitors implementation of the Integrated School Health Program (ISHP)	%	Monthly	Process/Activity	
School learner underweight rate	School learners underweight	School learners screened - total	Proportion of learners screened by a nurse in line with the ISHP service package diagnosed as underweight (below -2SD but above -3SD)	Monitors implementation of the Integrated School Health Program (ISHP)	%	Monthly	Process/Activity	
School learner overweight rate	School learners overweight	School learners screened - total	Proportion of learners screened by a nurse in line with the ISHP service package diagnosed as overweight (above +2SD)	Monitors implementation of the Integrated School Health Program (ISHP)	%	Monthly	Process/Activity	
School learner referred for Oral Health rate	School learner referred for Oral Health	School learners screened - total	Proportion of learners screened by a nurse in line with the ISHP service package and referred for Oral Health	Monitors implementation of the Integrated School Health Program (ISHP)	%	Monthly	Process/Activity	
School learner referred for Eye Care rate	School learner referred for Eye Care	School learners screened - total	Proportion of learners screened by a nurse in line with the ISHP service package and referred for Eye Care	Monitors implementation of the Integrated School Health Program (ISHP)	%	Monthly	Process/Activity	
School learner referred for Hearing problems rate	School learner referred for Hearing problems	School learners screened - total	Proportion of learners screened by a nurse in line with the ISHP service package and referred for Hearing problems	Monitors implementation of the Integrated School Health Program (ISHP)	%	Monthly	Process/Activity	
School learner referred for Speech problems rate	School learner referred for Speech problems	School learners screened - total	Proportion of learners screened by a nurse in line with the ISHP service package and referred for Speech problems	Monitors implementation of the Integrated School Health Program (ISHP)	%	Monthly	Process/Activity	
School learner referred for Suspected TB rate	School learner referred for Suspected TB	School learners screened - total	Proportion of learners screened by a nurse in line with the ISHP service package and referred for Suspected TB	Monitors implementation of the Integrated School Health Program (ISHP)	%	Monthly	Process/Activity	
School learner immunised rate	School learner immunised	School learners screened - total	Proportion of learners screened by a nurse in line with the ISHP service package and given immunisation	Monitors implementation of the Integrated School Health Program (ISHP)	%	Monthly	Process/Activity	

School Health

Indicator Name	Numerator	Denominator	Definition	Use and context	Type	Freq	Level	Key reports	
EMS	School learner deworming rate	School learners screened - total	Proportion of learners screened by a nurse in line with the ISHP service package and given deworming tablets	Monitors implementation of the Integrated School Health Program (ISHP)	%	Monthly	Process/ Activity		
	EMS call transport rate	EMS call client transported	Proportion EMS calls which resulted in clients being transported	Monitors the proportion of calls which resulted in clients actually being transported to health facilities in relation to the total number of calls dispatched by the Communications Centre	%	Monthly	Output		
	EMS inter-facility transfer rate	EMS inter-facility transfer	Inter-facility (from one inpatient facility to another inpatient facility) transfers as proportion of total EMS clients transported	Monitors use of ambulances for inter-facility transfers as opposed to emergency responses	%	Monthly	Output		
	EMS obstetric client transport rate	EMS obstetric client	Obstetric clients as proportion of total EMS clients transported	Monitors need for and use of ambulances for obstetric clients. Includes obstetric clients transported in obstetric and other operational ambulances	%	Monthly	Output		
	EMS operational ambulance coverage (annualised)	EMS operational ambulances	Population total	Number of operational ambulances per 10 000 population	Monitors compliance with the norm for operational ambulances to meet population needs. This includes obstetric ambulances	per10K	Monthly	Input	
	EMS operational Obstetric Emergency Unit coverage	EMS operational Obstetric Emergency Units	Population total	The number of operational obstetric units available for transporting obstetric cases per 10,000 population	Count only operational obstetric units. Exclude normal operational ambulances	%	Monthly	Input	
	EMS P1 call response under 60 minutes rate	EMS P1 response under 60 minutes	EMS P1 calls total	Proportion of all P1 calls with response times under 60 minutes	Monitors compliance with the norm for all critically ill or injured clients to receive EMS within 60 minutes. This includes P1 urban responses under 15 minutes and P1 rural calls under 40 minutes. Low rates indicate inadequate resources	%	Monthly	Output	
	EMS P1 rural response under 40 minutes rate	EMS P1 rural response under 40 minutes	EMS P1 rural calls	Proportion P1 calls in rural locations with response times under 40 minutes	Monitors compliance with the norm for critically ill or injured clients to receive EMS within 40 minutes in rural areas	%	Monthly	Output	
	EMS P1 urban response under 15 minutes rate	EMS P1 urban response under 15 minutes	EMS P1 urban calls	Proportion P1 calls in urban locations with response times under 15 minutes	Monitors compliance with the norm for critically ill or injured clients to receive EMS within 15 minutes in urban areas	%	Monthly	Output	
	OHH registration visit coverage (annualised)	OHH registration visit	OHH in population	Proportion of households in the target wards covered by Ward Based Outreach Teams	Monitors implementation of the PHC re-engineering strategy	%	Monthly	Output	
PHC WBOT	OHH follow-up visit rate	OHH follow-up visit	Outreach household follow-up visits as proportion of all households visits by Ward Based Outreach Teams	Monitors follow-up visits to registered households. Community health workers are expected to visit each household for follow up support monthly. At risk households need to be visited more frequently	%	Monthly	Process/ Activity		
	OHH supervised visit rate	OHH supervised visit	Outreach household (OHH) visits accompanied by a supervisor as proportion of all household visits by Ward Based Outreach Teams	Monitors supervision of ward based community health workers	%	Monthly	Process/ Activity		
	OHH with pregnancy care rate	OHH with pregnancy care	Outreach households (OHH) visits during which antenatal care was provided to pregnant women as proportion of households visited by the Ward Based Outreach Team	Monitors households where care was provided to pregnant women, irrespective of the number of pregnant women cared for	%	Monthly	Output		
	OHH with postnatal care rate	OHH with postnatal care	Outreach households (OHH) with postnatal care provided to a mother and/or neonate within 6 days after delivery as proportion of households visited by the Ward Based Outreach Team	Monitors households where care was provided to postnatal women, irrespective of the number of postnatal women cared for	%	Monthly	Output		

Indicator Name	Numerator	Denominator	Definition	Use and context	Type	Freq	Level	Key reports
OHH with child under 5 years care rate	OHH with child under 5 care	OHH visits total	Outreach households (OHH) with basic health care provided to children under 5 years as proportion of households visited by the Ward Based Outreach Team	Monitors households where care was provided to children under 5, irrespective of the number of children under 5 cared for	%	Monthly	Output	
OHH with adherence support rate	OHH with adherence support	OHH visits total	Outreach households (OHH) with adherence support provided as proportion of households visited by the Ward Based Outreach Team	Monitors households where adherence support was provided, irrespective of the number of clients who received support	%	Monthly	Output	
OHH with home based care rate	OHH with home based care	OHH visits total	Outreach households (OHH) with home based support provided as proportion of households visited by the Ward Based Outreach Team	Monitors households where homebased care was provided, irrespective of the number of clients who received homebased care	%	Monthly	Output	
OHH back-referral forms rate	OHH client with back-referral form	OHH client referred to facility	Outreach households (OHH) back referral forms received from PHC facilities as proportion of all households with referrals to PHC facility done by the Ward Based Outreach Team	Monitors back-referrals from PHC facilities. Each back-referral form is counted	%	Monthly	Process/Activity	
OHH client referred to facility rate	OHH client refer facility	OHH headcount total	Proportion of outreach household clients referred to health facilities	Monitors referral by Community Health Workers (CHW) to health facilities. Individual clients referred are counted	%	Monthly	Process/Activity	NSDA; NSP; WHO
OHH client referred to social services rate	OHH client referred to social services	OHH headcount total	Outreach households (OHH) clients referred to social services as proportion of the total number of clients supported (total headcount) during outreach team visits	Monitors referral by Community Health Workers (CHW) to social services. Individual clients referred are counted	%	Monthly	Process/Activity	NSDA; NSP; WHO
OHH client referred to home based care rate	OHH client referred to home based care	OHH headcount total	Outreach households (OHH) clients referred to home based care as proportion of the total number of clients supported (total headcount) during outreach team visits	Monitors referral by Community Health Workers (CHW) to home based care. Individual clients referred are counted	%	Monthly	Process/Activity	NSDA; NSP; WHO
OHH registration visit rate	OHH registration visit	OHH allocated to team	Outreach household (OHH) registration visits as proportion households allocated to Ward Based Outreach Teams	Monitors household registration. Each household allocated to a community health worker must be registered during the first outreach household visit, using the standardised Household Registration form	%	Monthly	Output	
OHH headcount under 5 years coverage (annualised)	OHH headcount under 5 years	Population under 5 years	Proportion of children under 5 years in population who received care during Ward Based Outreach Team visits	Monitors proportion of population under 5 years attended to during household visits	%	Monthly	Output	
OHH headcount 5 years and older coverage (annualised)	OHH headcount 5 years and older	Population 5 years and older	Proportion of people 5 years and older in the population who received care during Ward Based Outreach Team visits	Monitors proportion of population 5 years and older attended to during household visits	%	Monthly	Output	
EH Domestic water sample compliance rate	EH Domestic water samples compliant	EH Domestic water samples collected	Proportion of routine domestic water samples taken for a Water Services Authority and Non Water Services Authority that conforms to the standards set out in SANS 241	Monitors domestic water safety	%	Monthly	Process/Activity	
EH Flour mills compliance rate	EH Milling establishment compliant	EH Milling establishments inspected	Proportion of operational flour milling establishments that were compliant with regulations	Monitors flour milling establishment compliance	%	Monthly	Process/Activity	
EH Food sample bacteriological compliance rate	EH Food sample bacteriologically compliant	EH Food sample bacteriological analysis	Proportion food samples bacteriologically tested that complied to the Foodstuffs, Cosmetics and Disinfectants Act, Act 54 of 1972	Monitors food safety. Includes imported food stuffs	%	Monthly	Process/Activity	
EH Food sample chemical compliance rate	EH Food samples chemically compliant	EH Food samples chemical analysis	Proportion food samples chemically tested that complied to the Foodstuffs, Cosmetics and Disinfectants Act, Act 54 of 1972	Monitors food safety. Includes imported food stuffs	%	Monthly	Process/Activity	
EH Hazardous substance dealers compliance rate	EH Hazardous substance dealer compliant	EH Hazardous substance dealer inspected	Proportion Hazardous Substances dealers that complied with the regulations for hazardous substances	Monitors hazardous substance dealer compliance	%	Monthly	Process/Activity	

Environmental Health

Indicator Name	Numerator	Denominator	Definition	Use and context	Type	Freq	Level	Key reports
EH Health care waste generator compliance rate	EH Health care waste generator compliant	EH Health care waste generators inspected	Proportion inspected health care waste generators that complied with minimum standards according to SANS 10248	Monitors health care waste generator compliance	%	Monthly	Process/Activity	
EH International conveyance inspection rate	EH International conveyance inspected at first point of entry	EH International conveyance arrivals at first point of entry	Proportion international conveyance at arrival inspected for compliance to International Health standards	Monitors international conveyance inspection	%	Monthly	Process/Activity	
EH International imported consignment compliance rate	EH International imported consignment inspected	EH International imported consignment arrivals at first point of entry	Proportion international imported consignments that complied to International Health standards, compliant in terms of the National Port Health Standard Operating Procedures (revised SOPs) and International Health Regulations (IHR, 2005)	Monitors international imported consignment inspection	%	Monthly	Process/Activity	
EH Notifiable disease investigation rate	EH Notifiable medical conditions investigated new	EH Notifiable medical conditions reported to District Health Office	Proportion Notifiable medical conditions reported to the District Health Office that were investigated by EHP officers	Monitors Notifiable medical condition inspections by EHP officers	%	Monthly	Process/Activity	
EH Premises tobacco compliance rate	EH Premises tobacco legislation compliant	EH Premises tobacco legislation inspected	Proportion inspected premises that were compliant with Tobacco Act	Monitors premises compliant with Tobacco Act	%	Monthly	Process/Activity	
EH Reported Food poisoning incidence (annualised)	EH Food poisoning reported new	Population total	New cases of food poisoning reported to EHS per 100 000 population	Monitors food poisoning trends	per100K	Monthly	Outcome	
EH Reported lead poisoning incidence (annualised)	EH Lead poisoning reported new	Population total	New cases of lead poisoning reported per 100 000 population	Monitors chemical poisoning trends	per100K	Monthly	Outcome	
EH Reported mercury poisoning incidence (annualised)	EH Mercury poisoning reported new	Population total	New cases of mercury poisoning reported per 100 000 population	Monitors chemical poisoning trends	per100K	Monthly	Outcome	
EH Reported pesticide poisoning incidence (annualised)	EH Pesticide poisoning reported new	Population total	New cases of pesticide poisoning reported per 100 000 population	Monitors chemical poisoning trends	per100K	Monthly	Outcome	
Adult male start ART rate	Adult male started ART	Adult started on ART	Proportion of adult males who started ART. Treatment experienced clients are excluded	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA; MDG
Child under 1 year start ART rate	Child under 1 year started ART	Child under 15 years started ART	Proportion of children under 1 year who started ART. Treatment experienced clients are excluded	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA
Child 1 to under 5 years start ART rate	Child 1-<5 years started ART	Child under 15 years started ART	Proportion of children 1-5 years who started ART. Treatment experienced clients are excluded	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA
Child 5 to under 15 years start ART rate	Child 5-<15 years started ART	Child under 15 years started ART	Proportion of children 1-5 years who started ART. Treatment experienced clients are excluded	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA
Adult screened for TB at ART start rate	Adult not on TB treatment screened for TB at start of ART	Adult started on ART minus adults on TB treatment at start of ART	Proportion of adults not on Tuberculosis (TB) treatment who were screened for Tuberculosis at start of ART	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA
Child under 15 years screened for TB at ART start rate	Child under 15 years not on TB treatment screened for TB at start of ART	Child under 15 years started on ART minus children on TB treatment at start of ART	Proportion of children under 15 years not on Tuberculosis (TB) treatment who were screened for Tuberculosis at start of ART	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA
Adult on TB treatment at ART start rate	Adult on TB treatment at start of ART	Adult started ART	Proportion of adults who were on Tuberculosis (TB) treatment at start of ART	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA

ART baseline

Indicator Name	Numerator	Denominator	Definition	Use and context	Type	Freq	Level	Key reports
Child on TB treatment at ART start rate	Child under 15 years on TB treatment at start of ART	Child under 15 years started ART	Proportion of children who were on TB treatment at start of ART	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA
Adult on IPT at ART start rate	Adult on INH prevention therapy (IPT) at start of ART	Adult started ART	Proportion of adults who were on INH prevention therapy at start of ART	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA
Child on IPT at ART start rate	Child under 15 years on INH prevention therapy (IPT) at start of ART	Child under 15 years started ART	Proportion of children who were on INH prevention therapy at start of ART	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA
Adult on CPT at ART start rate	Adult on Co-trimoxazole prevention therapy (CPT) at start of ART	Adult started ART	Proportion of adults who were on Co-trimoxazole prevention therapy at start of ART	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA
Child under 15 years on CPT at ART start rate	Child under 15 years on Co-trimoxazole prevention therapy (CPT) at start of ART	Child under 15 years started ART	Proportion of children who were on Co-trimoxazole prevention therapy at start of ART	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA
Pregnant female at ART start rate	Pregnant female at start of ART	Adult female started ART	Proportion of adult females who were pregnant at start of ART	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA
Adult CD4 done at ART start rate	Adult CD4 done at start of ART	Adult native started ART	Proportion of adults who had a baseline CD4 count (BCDD) done before they started on ART	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA
Child under 15 years CD4 done at ART start rate	Child under 15 years CD4 done at start of ART	Child under 15 years CD4 done at start of ART	Proportion of children under 15 years who had a baseline CD4 count (BCDD) done before they started on ART	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA
Adult CD4 below 100 c/s/μl at ART start rate	Adult CD4 below 100 c/s/μl at start of ART	Adult CD4 done at start of ART	Proportion of adults with CD4 count below 100 c/s/μl at baseline. Shows the proportion of clients starting ART who are severely immunologically compromised. If the value changes over time the programme will be able to assess the impact of the intervention	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA
Child under 15 years CD4 TLC below 15pc or 100 c/s/μl at ART start rate	Child under 15 years CD4 TLC below 15pc or 100 c/s/μl at start of ART	Child under 15 years CD4 done at start of ART	Proportion of children under 5 years with a CD4 Total Lymphocyte Count (TLC) below 15 percent (pc) and children 5 to 15 years with a CD4 count of less than 100 cells/μl at the time of starting ART. This shows the proportion of clients starting ART who are severely immunologically compromised. If the value changes over time the programme will be able to assess the impact of the intervention	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA
Adult CD4 100 to 199 c/s/μl at ART start rate	Adult CD4 100 to 199 c/s/μl at start of ART	Adult CD4 done at start of ART	Proportion of adults with CD4 between 100-199 c/s/μl at baseline	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA
Child under 15 years CD4 TLC 15-19pc or 100-199 c/s/μl at ART start rate	Child under 15 years CD4 TLC 15-19pc or 100-199 c/s/μl at start of ART	Child under 15 years CD4 done at start of ART	Proportion of children under 5 years with a CD4 Total Lymphocyte Count (TLC) between 15 and 19 percent (pc) and children 5 to 15 years with a CD4 count between 100 and 199 cells/μl at the time of starting ART. This shows the proportion of clients starting ART who are severely immunologically compromised. If the value changes over time the programme will be able to assess the impact of the intervention	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA
Adult CD4 200 to 350 c/s/μl at ART start rate	Adult CD4 200 to 350 c/s/μl at start of ART	Adult CD4 done at start of ART	Proportion of adults with CD4 between 200-350 c/s/μl at baseline	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA

Indicator Name	Numerator	Denominator	Definition	Use and context	Type	Freq	Level	Key reports
Child under 15 years CD4 TLC 20-25pc or 100-199 c/s/μl at ART start rate	Child under 15 years CD4 TLC 20-25pc or 200-350 c/s/μl at start of ART	Child under 15 years CD4 done at start of ART	Proportion of children under 5 years with a CD4 Total Lymphocyte Count (TLC) between 20 and 25 percent (pc) and children 5 to 15 years with a CD4 count between 100 and 199 cells/μl at the time of starting ART. This shows the proportion of clients starting ART who are severely immunologically compromised. If the value changes over time the programme will be able to assess the impact of the intervention	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA
ART experienced at ART start rate	ART experienced (adult + child)	Adult and Child under 15 years started on ART	Proportion of clients with treatment experience at ART start	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA
Adult on second line regimen (SLR) at 3 months rate	Adult on second-line regimen (SLR) at xx months	Adult First line regimen + Second line regimen + Stopped at intervals	Proportion of adults on second line regimen after a period of time. This shows retention in care and if this percentage increase over time it shows that clients may be building more resistance to first line drug regimens	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Outcome	DORA; NSP; GAR; UA
Child on second line regimen (SLR) at 3 months rate	Child under 15 years on second-line regimen (SLR) at 3 months	Child First line regimen + Second line regimen + Stopped at intervals	Proportion of children on second line regimen after a period of time. This shows retention in care and if this percentage increase over time it shows that clients may be building more resistance to first line drug regimens	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Outcome	DORA; NSP; GAR; UA
Adult percentage on ART after 3 months	Adult TOT minus cumulative LTF minus cumulative RIP minus cumulative TFO	Adult cumulative started ART minus cumulative TFO	Cumulative Proportion of adults on treatment after interval. This value will enable the programme to assess retention on treatment over time. * Note that the TFO, LTF and RIP used in the formula are the cumulative totals of all clients who left care to that point, as opposed to the total in the most recent interval	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Outcome	DORA; NSP; GAR; UA
Child under 15 years percentage on ART after 3 months	Child TOT minus cumulative LTF minus cumulative RIP minus cumulative TFO	Child under 15 years started ART minus cumulative TFO	Cumulative Proportion of children on treatment after interval. This value will enable the programme to assess retention on treatment over time. * Note that the TFO, LTF and RIP used in the formula are the cumulative totals of all clients who left care to that point, as opposed to the total in the most recent interval	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Outcome	DORA; NSP; GAR; UA
Adult percentage died after 3 months ART	Adult cumulative RIP	Adult cumulative started ART minus cumulative TFO	Cumulative Proportion of adults who died after interval. At different time intervals the cumulative deaths can be analysed. * Note that the TFO, LTF and RIP used in the formula are the cumulative totals of all clients who left care to that point, as opposed to the total in the most recent interval	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Outcome	DORA; NSP; GAR; UA
Child under 15 years percentage died after 3 months ART	Child cumulative RIP	Child under 15 years started ART minus cumulative TFO	Cumulative Proportion of children who died after interval. At different time intervals the cumulative deaths can be analysed. * Note that the TFO, LTF and RIP used in the formula are the cumulative totals of all clients who left care to that point, as opposed to the total in the most recent interval	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Outcome	DORA; NSP; GAR; UA

ART at 3 months

Indicator Name	Numerator	Denominator	Definition	Use and context	Type	Freq	Level	Key reports
Adult percentage lost to follow up after 3 months ART	Adult cumulative LTF	Adult cumulative started ART minus cumulative TFO	Cumulative Proportion of adults who were lost to follow up after interval. At different time intervals the cumulative deaths can be analysed. * Note that the TFO, LTF and RIP used in the formula are the cumulative totals of all clients who left care to that point, as opposed to the total in the most recent interval	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Outcome	DORA; NSP; GAR; UA
Child under 15 years percentage lost to follow up after 3 months ART	Child cumulative LTF	Child under 15 years started ART minus cumulative TFO	Cumulative Proportion of children who were lost to follow up after interval. This value shows the attrition of the programme of clients who have not attended services for greater than 90 days. * Note that the TFO, LTF and RIP used in the formula are the cumulative totals of all clients who left care to that point, as opposed to the total in the most recent interval	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Outcome	DORA; NSP; GAR; UA
Adult with Viral load completion rate at 6 months	Adult viral load done (VLD) at xx months	Adult first line regimen + Adult second line regimen at intervals	Proportion of adults still on treatment who had Viral load test done at specific time intervals. This is a programme quality indicator	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA
Child under 15 years with Viral load completion rate at 6 months	Child under 15 years viral load done (VLD) at xx months	Child first line regimen + Child second line regimen at intervals	Proportion of children still on treatment who had Viral load test done at specific time intervals. This is a programme quality indicator	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA
Adult with Viral load suppressed rate at 6 months	Adult viral load under 400 copies/mL (VLS) at xx months	Adult viral load done (VLD) at intervals	Proportion of adults with Viral load suppressed at different time intervals. This indicates the population level immunological impact of clients on ART	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA
Child under 15 years with Viral load suppressed rate at 6 months	Child under 15 years viral load under 400 copies/mL (VLS) at xx months	Child under 15 years viral load done (VLD) at intervals	Proportion of children with Viral load suppressed at different time intervals. This indicates the population level immunological impact of clients on ART	This indicator only refers to ART naive patients started in this facility and does not track Transfers in or Treatment experienced patients	%	Quarterly	Output	DORA; NSP; GAR; UA

ART at 6 months

Data elements (count indicators):

Data Element Name	Short Name	Definition	Use and context	Frequency	Collected By	Collection Points	Tools
ART Monthly							
Adult started on ART during this month - naive	Adult ART start naive	Naive adults who started ART are the sum of the following: - Clients never been exposed to ART for more than 30 days in total - Clients from the PEP programme - Clients from the dual PMTCT programme	The following adults are excluded: - New treatment experienced - Transferred in	Monthly	Clinician; Data capturer	ART Site	ART Register
Adult remaining on ART at end of the month - total	Adult remain on ART tot	Total adults remaining on ART (Adult TROA) at the end of the reporting month are the sum of the following: - Any adult that has a current regimen in the column designating the month you are reporting on. - Any adult client that has a star without a circle (someone who is not yet considered lost to follow-up (LTF) in the column designating the month you are reporting on. Clients remaining on ART equals [Naive (including PEP and PMTCT) + Experienced (Exp) + Transfer in (TFI) + Restart] minus [Died (RIP) + Lost to follow-up (LTF) + Transfer out (TFO)]	NOTE that clients who have an outcome in the specified month or months previous should not be counted in this total	Monthly	Clinician; Data capturer	ART Site	ART Register
Child under 15 years started on ART during this month - naive	Child <15 start ART naive	Naive children under 15 years who started ART are the sum of the following: - Clients never been exposed to ART for more than 30 days in total - Clients from the PEP programme - Clients from the dual PMTCT programme	The following children are excluded: - New treatment experienced - Transferred in	Monthly	Clinician; Data capturer	ART Site	ART Register
Child under 15 years remaining on ART at end of the month - total	Child <15 remain ART tot	Total children under 15 years remaining on ART (Child TROA) at the end of the reporting month are the sum of the following: - Any child under 15 years that has a current regimen in the column designating the month you are reporting on. - Any child under 15 years that has a star without a circle (someone who is not yet considered lost to follow-up (LTF) in the column designating the month you are reporting on. Clients remaining on ART equals [Naive (including PEP and PMTCT) + Experienced (Exp) + Transfer in (TFI) + Restart] minus [Died (RIP) + Lost to follow-up (LTF) + Transfer out (TFO)]	NOTE that clients who have an outcome in the specified month or months previous should not be counted in this total	Monthly	Clinician; Data capturer	ART Site	ART Register
Total clients started on ART during this month - naive	Total start ART naive	Total naive clients who started ART are the sum of the following: - Clients never been exposed to ART for more than 30 days in total - Clients from the PEP programme - Clients from the dual PMTCT programme	The following clients are excluded: - New treatment experienced - Transferred in	Monthly	N/A	N/A	DHIS calculate
Total clients remaining on ART at end of the month	Total remain on ART	Total clients remaining on ART (TROA) are the sum of the following: - Any client that has a current regimen in the column designating the month you are reporting on. - Any client that has a star without a circle (someone who is not yet considered lost to follow-up (LTF) in the column designating the month you are reporting on. Clients remaining on ART equals [Naive (including PEP and PMTCT) + Experienced (Exp) + Transfer in (TFI) + Restart] minus [Died (RIP) + Lost to follow-up (LTF) + Transfer out (TFO)]	NOTE that clients who have an outcome in the specified month or months previous should not be counted in this total	Monthly	N/A	N/A	DHIS calculate
Medical male circumcision performed	MMC performed	Number of MMC performed	All males who are medically circumcised need to be recorded	Monthly	Manager	Inpatient Facility	Theatre Register
IH							

Indicator definitions

Type	Indicator	Definition
Demographic	Age dependency ratio	The ratio of the combined child population (0-14 years) and the aged population (65 years and over) - persons in the dependent ages - to every 100 people of the intermediate age population (15-65 years) - economically active ages. Where more detailed data are lacking, the age-dependency ratio is often used as an indicator of the economic burden the productive portion of a population must carry - even though some persons defined as dependent are producers and some persons in the productive ages are economically dependent.
	Ageing index	Ratio of the number of people 65+ to the number under 15 years. i.e. a value of 16 means there are 16 people aged 65 and over for every 100 people under 15 years of age. Calculated as $((65+ / 0-14) * 100)$
	Crude death rate (deaths per 1 000 population)	Number of deaths in a year per 1 000 population.
	Total fertility rate	The average number of children that a woman gives birth to in her lifetime, assuming that the prevailing rates remain unchanged.
	Annual population growth rate	The rate at which the population is increasing or decreasing in a given year expressed as a percentage of the base population size. It takes into consideration all the components of population growth, namely births, deaths and migration.
	Average household size	Average number of people living in each household where household is defined as a person, or a group of persons, who occupy a common dwelling (or part of it) for at least four days a week and who provide themselves jointly with food and other essentials for living. In other words, they live together as a unit. People who occupy the same dwelling, but who do not share food or other essentials, are enumerated as separate households.
	Population	Total number of people.
	Population % by province	Proportion of South African population in each province (calculated from population per province and population for whole of South Africa).
	Population % by ethnic group	Proportion of South African population in each ethnic group (calculated from population per ethnic group and population for whole of South Africa).
	Public sector dependent population	This is an adjustment of the total population to the number assumed to be dependent on services in the public health sector based on medical scheme (health insurance) coverage. It is calculated by subtracting the number of people with medical scheme cover (determined from medical scheme membership reports, or surveys indicating percentage of population on medical schemes) from the total population.
	Area (square km)	Land area covered by geographic entity.
	Area as a % of total area of South Africa	Area of province divided by total area of country (South Africa).
	Population density (people per km ²)	Number of people per square kilometre.
	Socio-economic	Education level: percentage of population 20 years and older with no schooling
Unemployment rate (official definition)		The official definition of the unemployed is that they are those people within the economically active population (aged 15-65) who (a) did not have a job or business during the 7 days prior to the interview, (b) want to work and are available to work within two weeks of the interview, and (c) have taken active steps to look for work or to start some form of self-employment in the 4 weeks prior to the interview.
Drinking Water System (Blue Drop) Performance Rating		Composite score measuring compliance of water suppliers with water quality management requirements. Includes microbiological, chemical and physical compliance criteria.
Percentage of households by type of housing		Percentage of households that are categorised as formal, informal, traditional or other.
Percentage of households using electricity for cooking		Percentage of households using electricity as their main energy source for cooking.
Percentage of households with access to piped water		Includes households with piped water in dwelling, piped water inside yard or piped water on a community stand (< 200m away or further).
Percentage of households with no toilet / bucket toilet		Percentage of households that have no toilet facility of any kind or were using a bucket toilet.
Percentage of households with telephone (telephone in dwelling or cell phone)		Percentage of households with a telephone in the dwelling or a cellular telephone.
Mortality	Adult mortality (45q15 - probability of dying between 15-64 years of age)	The probability of dying between the ages of 15 and 60 years of age (percentage of 15 year olds who die before 60th birthday).
	Life expectancy at birth	The average number of additional years a person could expect to live if current mortality trends were to continue for the rest of that person's life. (Most commonly cited as life expectancy at birth.)
Child mortality and related	Infant mortality rate (deaths under 1 year per 1 000 live births)	The number of children less than one year old who die in a year per 1 000 live births during that year.
	Low birth weight rate (% live births <2500g)	Percentage of live births under 2 500g.
	Neonatal death rate (NNDR) (deaths <28 days old per 1 000 live births)	Number of deaths within the first 28 days of life in a year per 1 000 live births during that year. Also called Neonatal Mortality Rate (NNMR).
	Number of under-5 deaths	The estimated number of deaths in children younger than 5 years.
	Perinatal care index (perinatal MR / LBWR)	Perinatal mortality rate divided by the low birth weight rate. The Perinatal Care Index is a quality of care index that has been validated as a true measure of the quality of care; the higher the index the poorer the care. The values should be below 1 for CHCs and below 2 for all hospitals.
	Perinatal mortality rate (deaths <8 days old per 1 000 total births)	The number of perinatal deaths per 1 000 births. The perinatal period starts as the beginning of foetal viability (28 weeks gestation or 1 000g) and ends at the end of the 7th day after delivery. Perinatal deaths are the sum of stillbirths plus early neonatal deaths. These are divided by total births (live births plus stillbirths).
	Stillbirth rate (per 1 000 total births)	Number of stillbirths per 1 000 total births.
	Under 5 mortality rate (deaths under 5 years per 1 000 live births)	The number of children under 5 years who die in a year per 1 000 live births during the year. It is a combination of the infant mortality rate plus the age 1-4 mortality rate.

Type	Indicator	Definition
Disability	Cataract surgery rate (annualised)	Cataract operations per million of the total population.
	Cataract surgery rate (surgeries per million uninsured population)	Number of cataract surgeries done per year per 1 million public sector dependent population.
	Prevalence of disability (%)	<p>Percentage of people reporting moderate to severe disability in a survey where disability is defined as a limitation in one or more activities of daily living (seeing, hearing, communication, moving, getting around, daily life activities, learning, intellectual and emotional).</p> <p>In the Community Survey 2007 and Census 2001, disability is defined as a physical or mental handicap which has lasted for six months or more, or is expected to last at least six months, which prevents the person from carrying out daily activities independently, or from participating fully in educational, economic or social activities.</p> <p>More recent surveys use the International Classification of Functioning, Disability and Health (ICF) approach where respondents are asked about 'difficulty' with various activities rather than disability, with a continuum from 'no difficulty' to 'not able'.</p> <p>Since the 2009 GHS (revised in 2011), StatsSA have also excluded data on children under 5 years old, since it was thought that these are often categorised as being unable to do the various activities, when this is in fact due to their level of development rather than any innate disabilities.</p>
Infectious Disease	Reported cases of (disease)	<p>The number of cases of (disease) reported to the Department of Health.</p> <p>Since case reporting of notifiable diseases has been so incomplete and delayed for several years, the number of laboratory confirmed cases from NHLS has been included where available, although these would be expected to include only a subset of the total number of notified cases.</p>
	Syphilis prevalence rate (%) (antenatal)	Percentage of women surveyed testing positive for syphilis.
Tuberculosis (TB)	Case detection rate: (all forms)	Proportion of incident cases of TB (all types) that were notified. For a given country, it is calculated as the number of notified cases of TB in one year divided by the number of estimated incident cases of TB in the same year, and expressed as a percentage.
	HIV prevalence in TB incident cases	Percentage of new TB cases that are HIV positive.
	Incidence of TB (all types) (per 100 000)	Estimated number of cases of tuberculosis (all types) per 100 000 population (for the year). Adjusted for estimated under-reporting of TB cases and other factors.
	Treatment success rate (%)	The proportion of new smear-positive TB cases registered under DOTS in a given year that successfully completed treatment, whether with bacteriologic evidence of success ('cured') or without ('treatment completed'). At the end of treatment, each patient is assigned one of the following six mutually exclusive treatment outcomes: cured; completed; died; failed; defaulted; and transferred out with outcome unknown. The proportions of cases assigned to these outcomes, plus any additional cases registered for treatment but not assigned to an outcome, add up to 100% of cases registered.
	Tuberculosis death rate per 100 000	<p>Number of deaths due to tuberculosis (all types) reported per 100 000 population (for the year).</p> <p>Note that the estimates calculated from the StatsSA cause of death data are not corrected for underreporting or ill-defined coding, and are thus not an accurate of mortality due to TB. In addition many deaths in HIV positive TB cases are misattributed to TB rather than HIV (according to the ICD-10 rules).</p>
	Tuberculosis death rate per 100 000 (excluding HIV)	Number of deaths due to tuberculosis (all types) reported per 100 000 population (for the year). The reported TB mortality excludes deaths occurring in HIV-positive TB cases, in accordance with the definition used in ICD-10.
	Tuberculosis prevalence rate per 100 000 population	Number of people with TB (all types) per 100 000 population. (MDG indicator 23)
Case finding	Proportion of extra-pulmonary TB	Number of extra-pulmonary TB cases divided by total number of TB cases. HIV-infected individuals are more likely to suffer from extra-pulmonary TB. The rising proportion of extra-pulmonary TB reflects the effect of the HIV epidemic on patterns of TB infection.
	Reported cases of TB (all types)	Number of cases of tuberculosis (all types) reported to the DoH for the year.
	Reported cases of TB (all types) (per 100 000)	Number of cases of tuberculosis (all types) reported to the Department of Health per 100 000 population (for the year). Note that reporting rates in some areas are far from complete and this may influence the values quite significantly.
	Reported cases of TB (new Sm+)	Number of cases of tuberculosis (new smear positive) reported to the DoH for the year.
	Reported cases of TB (PTB new Sm+) (per 100 000)	Number of cases of tuberculosis (pulmonary TB, new smear positive cases) reported to the Department of Health per 100 000 population (for the year).
	Reported cases of TB (PTB)	Number of cases of tuberculosis (pulmonary TB) reported to the DoH for the year.
Case holding	Smear positivity (percentage of PTB cases which are new Sm+)	Number of new smear positive PTB cases divided by number of new PTB cases.
	Cure rate (new Sm+ cases)	<p>Percentage of patients who are proven to be cured using smear microscopy at the end of treatment.</p> <p>The cure rate for new smear positive patients is regarded as the key indicator in high-burden countries. South Africa is working towards achieving the accepted WHO target of an 85% cure rate for new smear positive cases.</p>
	Defaulter (interruption) rate (new Sm+ cases)	Percentage of patients who do not complete their course of treatment (of new smear positive patients).
	Smear conversion rate (new Sm+ cases)	<p>Percentage of new smear positive PTB cases that are smear negative after two months of anti-TB treatment and are therefore no longer infectious.</p> <p>Numerator: Number of new PTB cases who were Sm+ before starting treatment but show a Sm- after 2 months treatment. Denominator: Total number of new Sm+ cases registered during specified time.</p>
Malaria	Successful completion rate (new Sm+)	Percentage of patients who are cured plus those who complete treatment but without laboratory proof of cure (of new smear positive patients)
	Case fatality rate: malaria	<p>Number of deaths divided by number of cases expressed as a percentage.</p> <p>The national target is to maintain a CFR below 0.5%.</p>
	Reported cases of malaria	The number of cases of malaria reported to the Department of Health.
	Reported cases of malaria (per 100 000)	The number of cases of malaria reported to the Department of Health per 100 000 population (for the relevant year). Also known as incidence of malaria.
	Reported deaths from malaria	The number of deaths from malaria reported to the Department of Health.

Type	Indicator	Definition
HIV and AIDS	AIDS orphans (maternal orphans)	Number of children under 18 years who have lost either a mother (maternal orphan), a father (paternal orphan) or both parents (a double orphan) due to HIV/AIDS.
	AIDS sick (number of people with AIDS-defining conditions)	Number of people estimated to be living with AIDS defining conditions.
	Antenatal client HIV 1st test positive rate	Antenatal clients tested HIV positive as a proportion of antenatal clients tested for HIV for the first time during the current pregnancy. Similar to HIV prevalence (antenatal), except that as more people may already know their status over time it does not necessarily provide a representative value for all antenatal clients.
	Antiretroviral coverage	The number of patients receiving ART, divided by the number needing treatment.
	Early infant diagnosis coverage	The numerator is the number of PCR tests performed by the National Laboratory Service for infants 2 months old or less, as a proxy for the first PCR test. The estimated number of HIV-exposed infants (denominator) is calculated by multiplying antenatal maternal HIV prevalence rates by the number of live births.
	HIV incidence	The HIV incidence rate is the percentage of people who are uninfected at the beginning of the period who will become infected over the twelve months. It refers to the annual diagnosis rate, or the number of new cases of HIV diagnosed each year. (The term 'prevalence' refers to the estimated population of people who have HIV at any given time.)
	HIV prevalence (%) (age 15-49)	Percentage of population (age 15-49) estimated to be HIV positive.
	HIV prevalence (%) (antenatal)	Percentage of women surveyed testing positive for HIV.
	HIV prevalence (%) (total population)	Percentage of population estimated to be HIV positive.
	Mother-to-child transmission rate of HIV <2 months of age	This indicator measures the proportion of HIV-exposed infants who received a PCR test under two months of age who tested positive.
	Number of patients receiving ART	Number of patients receiving ART.
	People living with HIV	The number of people who are HIV+.
	Percentage of deaths due to AIDS	Percentage of total deaths attributed to AIDS related causes.
	Proportion of ANC clients tested for HIV	Proportion of women coming for their first antenatal visit who are tested for HIV.
STIs	Incidence of STI treated	The percentage of people 15 years and older that have been treated for a new episode of an STI (annualised).
	STI partner treatment rate (%)	Number of STI partners treated new divided by number of STI treated new episode, expressed as a percentage.
Contraception and sexual behaviour	Age of first sex under 14 years (% having first had sex at age 14 or younger)	Percentage of people surveyed (of various age groups) who report having first had sexual intercourse at age 14 years or younger.
	Condom use at last sex (%)	Percentage of those (who reported ever having had sex) who used a condom the last time they had sex. Note that the precise definition of this indicator varies between surveys.
	Couple year protection rate	The rate at which couples (specifically women) are protected against pregnancy using modern contraceptive methods INCLUDING sterilisations. (previously Women year protection rate). Numerator: Contraceptive years equivalent Denominator: Target population 15-44 years (couples using females as proxy)
	Ever had sex (%)	Percentage of people who report that they have ever had sexual intercourse.
	HIV knowledge: people who know that a person can protect him / herself from HIV infection by condom	HIV knowledge: people aged 15-24 who know that a person can protect him / herself from HIV infection by consistent use of a condom.
	Male circumcision (% of men who are circumcised)	The percentage of men (15-59 years, unless otherwise specified) who have been circumcised.
	Male condom distribution rate	The number of male condoms distributed (to patients at the facility or through other channels) per male 15 years and older.
	Male condoms distributed (thousands)	Number of male condoms distributed.
Maternal health	Teenage pregnancy	Percentage of women aged 15-19 who are mothers or who have ever been pregnant. The percentage of women who are mothers at the time of the survey is a more restrictive definition. Note that some of the surveys report this indicator as the percentage who have ever been pregnant of those WHO HAVE EVER HAD SEX. This is a different denominator to that used by the Demographic and Health Surveys, and the data can therefore not be directly compared.
	ANC coverage	Proportion of pregnant women receiving some antenatal care. DHIS data source: Estimated from the number of first ANC visits divided by the expected number of pregnant women. HSRC data source: Percentage of women surveyed who reported receiving some antenatal care from a nurse, midwife or doctor.
	ANC visits per client	The total number of antenatal visits over the number of first antenatal visits (equivalent to number of antenatal clients).
	Caesarean section rate	Percentage of births that are by caesarean section.
	Delivery rate in facility	The percentage of deliveries taking place in health facilities under supervision of trained personnel. (The number of children under one year, factorised by 1.07 due to infant mortality, is used as an estimated proxy denominator for expected deliveries.)
	Maternal mortality ratio (MMR)	The number of women who die as a result of childbearing, during the pregnancy or within 42 days of delivery or termination of pregnancy in one year, per 100 000 live births during that year.
	Number of maternal deaths	The number of women who die as a result of childbearing, during the pregnancy or within 42 days of delivery or termination of pregnancy in one year. In the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, 1992 (ICD-10), WHO defines maternal death as: The death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes. For countries using ICD-10 coding for registered deaths, all deaths coded to the maternal chapter (O codes) and A34 (maternal tetanus) were counted as maternal deaths. Note that the system of Confidential Enquiries into maternal deaths (NCCEMD) only captures INSTITUTIONAL deaths, and thus is known to miss deaths occurring at home.
	PMDF (proportion maternal among deaths of females of reproductive age)	An alternative measure of maternal mortality, the proportion of deaths among females of reproductive age (PMDF) that are due to maternal causes, is calculated as the number of maternal deaths divided by the total deaths among females aged 15-49 years.

Type	Indicator	Definition
Termination of Pregnancy	TOP facilities functioning (%)	Percentage of functioning TOP facilities. Numerator: Number of designated facilities providing termination of pregnancy services. Denominator: Total number of designated TOP facilities.
	ToP rate (%)	Percentage of pregnant women who have had an abortion. DHIS definition: Termination of Pregnancies performed in a health facility as the proportion of all expected pregnancies in the catchment population.
	TOPs (Terminations of Pregnancy)	The number of terminations of pregnancy.
Nutrition	Obesity (%)	Percentage of people with a body mass index (BMI) (body mass in kg divided by the square of the height in m) equal to or more than 30kg/m ² .
	Overweight (%)	Children: Proportion of children with weight for height over 2 standard deviations from the norm (reference population median). Adults: Percentage of people with body mass index (BMI) of 25-29.9 kg/m ² .
	Stunting (%)	Proportion of children with height for age under 2 standard deviations from the norm (reference population median).
	Underweight (%)	Children: Proportion of children with weight for age under 2 standard deviations from the norm (reference population median). Adults: Percentage of people with body mass index (BMI) <18.5 kg/m ² .
	Vitamin A coverage children 12-59 months	Proportion of children 12-60 months receiving vitamin A 200 000 units twice a year. The denominator is thus the target population 1-4 years multiplied by 2.
	Vitamin A coverage infants 6-11 months	Percentage of infants 6-11 months receiving vitamin A 100 000 units.
	Wasting (%)	Proportion of children with weight for height under 2 standard deviations from the norm (reference population median).
Child Health	Children under 5 years weighing rate	The proportion of PHC headcount under 5 years that were weighed. Monitoring whether the policy of weighing all children seen at least once a month is being adhered to.
	Diarrhoea incidence under 5 years (per 1 000)	The number of children under 5 years with diarrhoea per 1 000 population under 5 years per year. Diarrhoea is formally defined as 3 or more watery stools in 24 hours, but any episode diagnosed and/or treated as diarrhoea after an interview with the adult accompanying the child should be counted.
	Not gaining weight under 5 years rate (%)	The proportion of children weighed who had an episode of growth faltering/failure during the period. Note that WC uses a 'tighter' definition of not gaining weight.
	Number of orphans	Number of children under 18 years whose biological mother, biological father or both parents have died. Different kinds of orphans are defined as: maternal orphans - a child whose mother has died, or whose living status is not known, but whose father is alive. paternal orphans - a child whose father has died, or whose living status is not known, but whose mother is alive. double/dual orphan - a child whose mother and father have both died, or whereabouts are unknown.
	Orphanhood (%)	Proportion of children under 18 years whose biological mother, biological father or both parents have died.
	Pneumonia incidence rate under 5 years	The number of children under 5 years diagnosed with pneumonia, per 1 000 children in the catchment population. This indicator was called Lower Respiratory Tract Infection (LRTI) incidence rate, due to incorrect interpretation of LRTI.
	Severe malnutrition under 5 years incidence (per 1 000)	The number of children who weigh below 60% expected weight for age (new cases that month) per 1 000 children in the target population.
Immunisation	BCG coverage	The proportion of expected live born babies that received BCG under 1 year of age (note: usually given right after birth)
	DTP3 coverage	The proportion of children who received their third DTP-Hib doses (normally at 14 weeks) From approximately 2009 when the immunisation schedule changed, this is defined as: The proportion of children under 1 year who received their DTaP-IPV/Hib (Pentaxim) 3rd dose, normally at 14 weeks - annualised.
	Immunisation coverage of children <1 year	Proportion of children under 1 year who are fully immunised. Calculated from the number of children fully immunised (defined as first visit where all required vaccinations are completed) divided by the population <1 year. A primary course includes BCG, OPV 1,2 & 3, DTP-Hib 1,2 & 3, HepB 1,2 & 3, and 1st measles (usually at 9 months).
	Measles 1st dose coverage (%)	The proportion of children who received their 1st measles dose (normally at 9 months) - annualised. Numerator: Measles 1st dose under 1 year Denominator: Target population under 1 year
	OPV 1 coverage	The proportion of children under 1 immunised with OPV dose 1.
	PCV7 3rd dose coverage (annualised)	The proportion of children who received their third PCV7 dose (around 9 months) - annualised.
	RV 2nd dose coverage (annualised)	The proportion of children who received their second RV dose (around 14 weeks) - annualised.
Chronic Diseases	Cervical cancer screening coverage	Women 30 years and older with a cervical (pap) smear done for screening purposes according to the national policy of screening all women in this age category every 10 years, as the proportion of all women 30 years and older in the target population. Denominator is 10% of the female target population 30 years and older.
	Hypertension prevalence (per 1 000)	Number of people with hypertension per 1 000 people in the target population. The prevalence of hypertension is classified as follows: Blood pressure equal to or above 140/90 mmHg or taking hypertension medication. Data have been converted from a percentage to the rate per 1 000 population.
Behaviour & Awareness	Alcohol dependence (%)	Proportion of people who show signs of alcohol dependence. Alcohol dependence is identified using four screening questions that indirectly inquire about alcohol use (CAGE questionnaire). An affirmative answer to two or more questions is classified as alcohol dependence. CAGE questions are: C - Has anyone ever felt you should Cut down on your drinking? A - Have people Annoyed you by criticizing your drinking? G - Have you ever felt Guilty about your drinking? E - Have you ever had a drink first thing in the morning (Eye-opener) to steady your nerves or to get rid of a hangover?
	Ever smoked cigarettes (%)	Proportion of people who have ever smoked a cigarette, even one or two puffs.
	Number of admissions for alcohol and other drug abuse	Number of patients admitted for treatment by treatment centres who are part of the SACENDU Project sentinel surveillance system.
	Prevalence of smoking (%)	Proportion of population who currently smoke. This indicator is also known as 'Current smokers (%)' Note that the indicator may be given just for cigarettes or for other tobacco products.
	Primary drug of abuse as % of all drugs of abuse	Percentage breakdown of the primary drug of abuse reported by patients admitted to treatment centres that are part of the SACENDU sentinel surveillance system. Note that poly-substance abuse is high.

Type	Indicator	Definition
Injuries	Road accident fatalities per 100 000 population	Number of fatalities due to road accidents per 100 000 population.
Health Facilities	Percentage of users of private health services highly satisfied with the service received	Percentage of users of private health services highly satisfied with the service received.
	Percentage of users of public health services highly satisfied with the service received	Percentage of users of public health services highly satisfied with the service received.
	Average length of stay (ALOS)	Average duration of patient stay in health facility. Numerator: Inpatient days + 1/2 Day patients Denominator: Discharges + Deaths + Transfers out + Day patients.
	Useable bed utilisation (occupancy) rate (BUR)	Measure of the occupancy of the beds available for use. Numerator: (Inpatient days + 1/2 Day patients) x 100 Denominator: Useable beds x days in period.
	Useable beds per 1 000 population	The number of useable beds divided by the population x 1 000. Where this is calculated for public health sector beds, the population used is the public sector dependent (uninsured) population.
	Utilisation rate PHC	Number of visits per person to PHC health facilities per year. Calculated from PHC headcount divided by total population.
	Utilisation rate PHC <5 years	Number of visits per person <5 years to PHC health facilities per year. Calculated from PHC headcount <5 years divided by population <5 years.
Health Personnel	Number of (health professionals) registered	Number of this category of health professional registered with the relevant professional council. This number includes those working in the public or private sector as well as those registered but not working or overseas. Description of selected categories: An enrolled nurse (EN) or sometimes called a staff nurse is an individual who has completed a two year programme usually at a nursing college or exited after completing two years of the university four year programme. This person is educated and competent to practice basic nursing. An enrolled nursing auxiliary (ENA) or sometimes called an assistant nurse (AN) which is an individual who has completed a year programme or a similar course at college or exited after completing the first year of the university four year programme. This person is educated and competent to practice elementary nursing. A professional nurse (PN) or registered nurse (RN) (and sometimes called a sister), is an individual who has completed a four year programme at university or a nursing College. This person is educated and competent to practice comprehensive nursing and midwifery. A pupil auxiliary is an individual on one year or similar nursing course at a public or private nursing institution. A pupil nurse is an individual on a two year nursing programme at a public or private nursing institution. A student nurse is a person who is in the process of training either on a four year nursing programme at Nursing College or University.
	Number of (health professionals)	Number of this category of health professional working in the specified sector.
	Total number of health professional posts	Total number of health sector posts (health professional categories) including dental, medical, nursing, pharmacy, occupational therapy, physiotherapy, radiography and psychology professions. Data from 2002 also includes environmental health professionals, and from 2009 clinical associates were added. Note that older data from PERSAL also included some vacant posts for each profession. Newer data has most of the vacant posts identified, and therefore the number of posts primarily reflects filled posts.
	Number of CS (health professionals)	Number of community service (health professionals). For each cadre.
	(Health professionals) per 100 000 population	Ratio of the number of personnel to the population (per 100 000). Note that the measure of the number of personnel may differ for the public and private sectors and also that the population may be adjusted to be the population assumed to be dependent on that sector.
Health Financing	Claims ratio	Percentage of member contributions that has been utilised for the payment of benefits claimed by members of medical schemes, as opposed to allocation of contributions for non-health benefits and the building of reserves.
	Medical scheme beneficiaries	Number of medical scheme (scheme) beneficiaries, as reported by the Medical Schemes Council.
	Medical scheme coverage	Percentage of population covered by medical schemes.
	Pensioner ratio	Percentage of members of medical schemes who are 65 years or older, in registered medical schemes.
	Per capita expenditure (non-hospital PHC)	Amount spent on non-hospital PHC services by the public sector per person without medical aid coverage (in Rands). Includes provincial expenditure from sub-programmes 2.1-2.5 (District management, Community health clinics, Community health centres, Community-based services and Other community services) under District Health Services, plus net Local government expenditure on health services. Expenditure is divided by the population without medical scheme coverage.
	Per capita health expenditure	Amount spent on health per person (in Rands) For the public sector this is calculated for the population without medical scheme coverage (public sector dependent population). For the private sector this is usually calculated for the number of medical schemes beneficiaries.

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Abbreviations

A	
ACE Inhibitors	Angiotensin Converting Enzyme Inhibitors
ActNow BC	ActNow British Columbia
ACTS	Advise, Consent, Test Support
ADEC	Australian Drug Evaluation Committee
AIDS	Acquired Immune Deficiency Syndrome
ANC	African National Congress
ANC	Antenatal Care
ANC	Antenatal Client
API	Active Pharmaceutical Ingredients
APP	Annual Performance Plan
ART	Antiretroviral Treatment
ART	Antiretroviral Therapy
ARV	Antiretroviral
ARV APIs	Antiretroviral Active Pharmaceutical Ingredients
ASSA	Actuarial Society of South Africa
ASSAf	Academy of Science of South Africa
AU	African Union
AZT	Azidothymidine
B	
BANC	Basic Antenatal Care
BAS	Basic Accounting System
BMD	Bipolar Mood Disorders
BoD	Burden of Disease
BRICS	Brazil, Russia, India, China and South Africa
C	
CXR	Chest X-Ray
CVS	Concurrent Versions System
CVD	Cardiovascular Disease
CToP	Choice on Termination of Pregnancy
CSIR	Council for Scientific and Industrial Research
CSDH	Commission on Social Determinants of Health
CPD	Continuing Professional Development
CPAP	Continuous Positive Airway Pressure
COPD	Chronic Obstructive Pulmonary Disease
COMMiC	Committee on Morbidity and Mortality in Children Under 5 Years
Comed	Coordinating Committee for the Provisioning of Medical Supplies
COIDA	Compensation for Occupational Injuries and Diseases Act
CoCT	City of Cape Town
CMD	Central Medicine Depot
CI	Confidence Interval
CHW	Community Health Worker
CHP	Centre for Health Policy
Child PIP	Child Healthcare Problem Identification Programme
CHEPSAA	Consortium on Health Policy and Systems Analysis in Africa
CHC	Community Health Centre
CHAI	Clinton Health Access Initiative
CFAI	Community Food Action Initiatives
CEO	Chief Executive Officer
CEDAC	Canadian Expert Drugs Advisory Committee
CDR	Common Drug Review
CDL	Chronic Disease List
CDC	Centers for Disease Control
CCOD	Commissioner for Occupational Disease
CCMT	Comprehensive Care Management and Treatment
CCHIP	Community Childhood Hunger Identification Project
CC	Climate Change
CARMMA	Campaign for Accelerated Reduction in Maternal and Child Mortality in Africa

CAPA	Climate Adaptation Plan of Action
CANSA	Cancer Association of South Africa
CADTH	Canadian Agency for Drugs and Technology in Health
D	
DALYs	Disability Adjusted Life Years
DAM	Directorate Affordable Medicines
DCSTs	District-based Clinical Specialist Teams
DDT	Dichlorodiphenyltrichloroethane
DEDAT	Departments of Economic Development and Tourism
DEX	District Executive
DFID	Department for International Development (United Kingdom)
DHA	Department of Home Affairs
DHB	District Health Barometer
DSER	District Health Expenditure Review
DHIS	District Health Information System
DHMIS	District Health Management Information System
DHMT	District Health Management Team
DHS	Demographic Health Survey
DHS	District Health System
DMA	District Managed Areas
DMs	District Municipalities
DoH	Department of Health
DoL	Department of Labour
DSS	Demographic and Surveillance Sites
DTI	Department of Trade and Industry
DTP3	Diphtheria-Tetanus-Pertussis Vaccine
DWQM	Drinking Water Quality Management
E	
ECD	Early Child Development
ECTA	Electronic Communications and Transactions Act
EDL Paediatric	Essential Drugs List Paediatric
EDL Primary Care	Essential Drugs List Primary Care
EDL Secondary Care	Essential Drugs List Secondary Care
EDL Tertiary and Quarternary	Essential Drugs List Tertiary and Quarternary
EFV	Efavirenz, Sustiva
EH	Environmental Health
EHR	Electronic Health Record
EHS	Environmental Health Services
EML	Essential Medicines List
EMR	Electronic Medical Record
EMS	Emergency Medical Services
EOST	Emergency Obstetric Simulation Training
EPI	Expanded Programmme on Immunisation
ESMOE	Essential Steps in Management of Obstetric Emergencies
ETR	Electronic Tuberculosis Register
F	
FAMSA	Family and Marriage Association of South Africa
FET	Further Education and Training
FRATT	Facilities Risk Assessment Tool for Tuberculosis
FS	Free State Province
FTE	Full-Time Equivalent
G	
GBD	Global Burden of Disease
GDP	Gross Domestic Product
Gene Xpert MTB/RIF	Test to Identify Mycobacterium Tuberculosis and Resistance to Rifampicin
GERD	Gross Domestic Expenditure on Research and Experimental Development
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
GHS	General Household Survey
GISAH	Global Information Systems on Alcohol and Health
GPS	Geographic Positioning System
GSK	GlaxoSmithKline

H	
HAART	Highly Active Antiretroviral Therapy
HAST	HIV/AIDS, STIs and TB
HCT	HIV Counselling and Testing
HCT	Health Care Transformation
HCW	Healthcare workers
HCWH	Health Care Without Harm
HDACC	Health Data Advisory and Co-ordination Committee
HDI	Human Development Index
HEARD	Health Economics and HIV/AIDS Research Division
HELPP	Hemolysis, Elevated Liver Enzymes, Low Platelets
HEU	Health Economics Unit
HIS	Health Information System
HIV	Human Immunodeficiency Virus
HMT	Health Management Team
HOD	Head of Department
HP01-2011TB	Tuberculosis Agents
HP022011AI	Anti-infective Agents
HP04-2012NC	Oncology and Immunological Agents
HP06-2012VP	Small Volume Parenterals and Insulin Devices
HP07-2012DAI	Drops, Aerosols, Inhalers and Inhalants
HP08-2012SSD	Semi-solid Dosage Forms
HP09-2012SD	Solid Dosage Forms (tablets)
HPCSA	Health Professions Council of South Africa
HPSP	Health Policy and Systems Programme
HPSR	Health Policy and Systems Research
HPTN 052	HIV Prevention Trials Network 052
HR	Human Resources
HRH	Human Resources for Health
HRM	Human Resource Management
HSDSS	Health and Socio-Demographic Surveillance System
HSF	Heart and Stroke Foundation
HSRC	Human Sciences Research Council
HSSR	Health Systems and Services Research
HST	Health Systems Trust
HSV2	Herpes Simplex Type 2
HTA	Health Technology Assessment
HTC	Haemophilia Treatment Centers
I	
ICIDH	International Classification of Impairments Disabilities and Handicaps
ICT	Information and Communication Technology
IDP	Integrated Development Planning
IHME	Institute of Health Metrics and Evaluation
IJTLD	International Journal of Tuberculosis and Lung Disease
ILO	International Labour Organization
IMC	Inter Ministerial Committee
IMCI	Integrated Management of Childhood Illness
iMMR	Institutional Maternal Mortality Ratio
IMR	Infant Mortality Rate
IMSA	Innovative Medicines South Africa
INDEPTH	International Network for the Demographic Evaluation of Populations and Their Health
INH	Isoniazid
INN	International Nonproprietary Names
IOM	Institute of Medicine
IP	Intellectual Property
IPC	Infection Prevention Control
IPT	Isoniazid Prevention Treatment
ISDMT	Integrated Sub-District Management Team
ISHP	Integrated School Health Programme
IT	Information Technology
IVD	In Vitro Diagnostics

J	
JSI/ESI	John Snow Inc.'s Enhancing Strategic Information
JUDASA	Junior Doctors Association of South Africa
K	
KCPP	Katine Community Partnership Project
KMC	Kangaroo Mother Care
KZN	KwaZulu-Natal Province
L	
LBW	Low Birth Weight
LEP	Low English Proficiency
LIGHTS	Lightning Interest Group for Health Technology and Science
LMICs	Low and Middle Income Countries
LTBI	Latent Tuberculosis Infection
M	
M&E	Monitoring and Evaluation
MBFI	Mother and Baby Friendly Health Initiative
MBOD	Medical Bureau for Occupational Diseases
MCC	Medicines Control Council
MDB	Municipal Demarcation Board
MDGs	Millennium Development Goals
MDHS	Metro District Health System
MDR	Multidrug Resistant
MEC	Member of Executive Council
MHSA	Mine Health and Safety Act
MIC	Mineworkers Investment Company / Multiple Indicator Cluster Survey
MMR	Maternal Mortality Ratio
MNCWH	Maternal, Newborn, Child and Women's Health
MOC	Maintenance of Certification
MoH	Ministry of Health
MoHSW	Ministry of Health and Social Welfare
MP	Mitchell's Plain
MP	Mpumalanga Province
MPH	Masters of Public Health
MRC	Medical Research Council
MSAT	Multi-Sectoral Action Teams
MSH	Management Sciences for Health
MSM	Men who have Sex with Men
MTB	Mycobacteria Tuberculosis
MTCT	Mother-To-Child Transmission
MTSF	Medium Term Strategic Framework
N	
NaPeMMCo	National Perinatal Mortality and Morbidity Committee
NCCEMD	National Committee for Confidential Enquiries into Maternal Deaths
NCDs	Non-Communicable Diseases
NDoH	National Department of Health
NDP	National Drug Policy
NEMLC	National Essential Medicines List Committee
NGO	Non-Governmental Organisation
NHC	National Health Council
NHI	National Health Insurance
NHIRD	National Health Information Repository and Database
NHISSA	National Health Information System of South Africa
NHLS	National Health Laboratory Services
NHMIS	National Health Management Information System
NHS	National Health Service
NICD	National Institute for Communicable Diseases
NICE	The National Institute for Health and Clinical Excellence
NIDS	National Indicator Data Set
NIMSS	National Mortality Surveillance System
NPO	Non-Profit Organisation
NPR	National Population Register
NRF	National Research Foundation

NSDA	Negotiated Service Delivery Agreement
NSP	National Strategic Plan
NT	National Treasury
NVP	Nevirapine, Viramune
NW	North West Province
O	
ODMWA	Occupational Diseases in Mines and Works Act
ODMWA	Occupational Diseases in Mines and Works Act
OHS	Occupational Health and Safety
OHSC	Office of Health Standards Compliance
OPD	Outpatient Department
P	
PALSA	Practical Approach to Lung Health in South Africa
PALSA PLUS programme	Practical Approach to Lung Health and HIV/AIDS
PBAC	Pharmaceutical Benefits Advisory Committee
PBPA	Pharmaceutical Benefits Pricing Authority
PBS	Pharmaceutical Benefits Scheme
PCMA	Pharmaceutical Care Management Association of South Africa
PCR	Polymerase Chain Reaction
PDR	Physicians' Desk Reference
PEPFAR	President's Emergency Plan for AIDS Relief
PFMA	Public Finance Management Act
PHARMAC	Pharmaceutical Management Agency
PHASA	Public Health Association of South Africa
PHC	Primary Health Care
PIMSS	Provincial Mortality Surveillance System
PIP	Problem Identification Programme
PMB	Prescribed Minimum Benefits
PMDF	Proportion Maternal Among Deaths of Females of Reproductive Age
PMI	Patient Master Index
PMTCT	Prevention of Mother-to-Child Transmission
PPE	Personal Protective Equipment
PPIP	Perinatal Problem Identification Programme
PPP	Private-Public Partnership
PQIC	Provincial Quality Improvement Committee
PRICELESS SA	Priority Cost Effective Lessons for Systems Strengthening – South Africa
ProPeMMCo	Provincial Perinatal Morbidity and Mortality Committees
PTC	Pharmaceutical and Therapeutics Committees
PTMS	Provincial Transversal Management System
PTSD	Post-Traumatic Stress Disorder
PURE	Prospective Urban Rural Epidemiological
R	
R&D	Research and Development
RAF	Road Accident Fund
RESYST	Responsive and Resilient Health Systems
RMS	Rapid Mortality System
RPM Plus	Rational Pharmaceutical Management Plus
RPR	Rapid Plasma Reagin
RSH	Reproductive and Sexual Health
RTMC	Road Traffic Management Corporation
S	
SA	South Africa
SACBIA	South African Consortium for Benefits Incidences Analysis
SACENDU	South African Epidemiology Network on Drug Abuse
SADAP	South African Drug Action Programme
SADC	Southern African Development Community
SADHS	South Africa Demographic and Health Survey
SAELPH	South African Executive Leadership Programme in Health
SAGE	Study on Global AGEing and Adult Health
SALDRU	Southern African Labour and Development Research Unit
SAMA	South African Medical Association
SAMJ	South African Medical Journal

SANAC	South African National AIDS Council
SANC	South African Nursing Council
SANHANES	South African National Health and Nutrition Examination Survey
SAPC	South African Pharmacy Council
SARChi	South African Research Chairs Initiative
SASH	South African Stress and Health Survey
SCA	Supreme Court of Appeal
SD	Sub-District
SDGs	Sustainable Development Goals
SDH	Social Determinants of Health
SEP	Standards-Essential Patent
SES	Socio-Economic Status
SIR	Smoking Impact Ratio
SITA	State Information Technology Agency
SLA	Service Level Agreement
SOP	Standard Operating Procedures
SOPH & FM	School of Public Health and Family Medicine of the University of Cape Town
SOPH UWC	University of the Western Cape School of Public Health
SRHR	Sexual and Reproduction Health and Rights
SS	Sub Structure
Stats SA	Statistics South Africa
STG	Standard Treatment Guidelines
STIs	Sexually Transmitted Infections
STRETCH	Streamlining Tasks and Roles to Expand Treatment and Care for HIV
T	
TAC	Treatment Action Campaign
TAC	Technology Appraisal Committee
TasP	Treatment as Prevention
TB	Tuberculosis
TBIC	TB Infection Control
TEBA	The Employment Bureau of South Africa
TFR	Total Fertility Rate
TGA	Therapeutic Good Administration
ThaiHealth	Thai Health Promotion Foundation
TRIPS	Trade Related Intellectual Property
U	
U5MR	Under-5 Mortality Rate
UCT	University of Cape Town
UFH	University of Fort Hare
UHC	Universal Health Coverage
UK	United Kingdom
UN	United Nations
UN IGME	United Nations Inter-agency Group for Child Mortality Estimation
UNAIDS	Joint United Nation Programme on HIV/AIDS
UNGASS	UN General Assembly Special Session
UNICEF	United Nations Children's Fund
UP	University of Pretoria
UPFS	Uniform Patient Fee Schedule
US	United States
USA	United States of America
USAID	United States Agency for International Development
UWC	University of the Western Cape
V	
VAT	Value Added Tax
VCT	Voluntary Counselling and Testing
VOCS	Victims of Crime Survey
VPUU	Violence Prevention through Urban Upgrading
W	
WAN	Wide Area Network
WBOT	Ward Based Outreach Team
WCO	World Customs Organization
WG	Washington Group

WHA	World Health Assembly
WHO	World Health Organization
WHO AFRO	World Health Organization Regional Office for Africa
WHO FCTC	World Health Organization Framework Convention on Tobacco Control
WIPO	World Intellectual Property Organization
WISN	Workload Indicators of Staffing Needs
Wits	University of the Witwatersrand
WRHI	Wits Reproductive Health and HIV Institute
WTO	World Trade Organization
Y	
YRBS	Youth Risk Behavior Surveillance
YLDs	Years Lived With Disability
YLLs	Years of Life Lost
X	
XDR	Extensively Drug-Resistant
XDR-TB	Extensively Drug-Resistant Tuberculosis

