HEALTH DATA ADVISORY AND CO-ORDINATION COMMITTEE (HDACC)

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Acronyms and abbreviations

AGSA	–	Auditor-General of South Africa
AIDS	–	Acquired Immune Deficiency Syndrome
ANC	–	Antenatal care
APP	–	Annual Performance Plan
ART	–	Antiretroviral therapy
ARV	–	Antiretrovirals
ASSA	–	Actuarial Society of South Africa
AZT	–	Azidothymidine
BAS	–	Basic Accounting Systems
BHF	–	Board of Health Care Funders
BMI	–	Body Mass Index
CARe	–	Centre for Actuarial Research (University of Cape Town)
CD4	–	Cluster of differentiation 4
CI	–	Confidence interval
CoMMiC	–	Committee of Mortality and Morbidity in Children
CRVS	–	Civil Registration and Vital Statistics
DBE	–	Department of Basic Education
DCST	–	District Clinical Specialist Teams
DHIS	–	District Health Information System
DHMIS	–	District Health and Management Information System
DHA	–	Department of Home Affairs
DoH	–	Department of Health
DoJ&CS	–	Department of Justice and Correctional Services
DPME	–	Department of Planning, Monitoring and Evaluation
DR-TB	–	Drug-resistant tuberculosis
EDR.Web	–	Electronic drug-resistant tuberculosis register
EPP	–	Estimation and projection package
ETR.Net	–	Electronic TB register
FACTS	–	Follow-on African Consortium for Tenofovir Studies
FDC	–	Fixed-dose combination
FFC	–	Financial and Fiscal Commission
FY	--	Financial year
GDP	–	Gross Domestic Product

GeneXpert MTB/RIF	–	Test for Mycobacterium tuberculosis and resistance to rifampicin
HASA	–	Hospital Association of South Africa
HDACC	–	Health Data Advisory and Co-ordination Committee
HEMIS	–	Higher Education Management Information System
HIV	–	Human Immunodeficiency Virus
HMIS	–	Health Management Information System
HST	–	Health Systems Trust
HSRC	–	Human Sciences Research Council
HMIS	–	Health and Management Information System
ICU	–	Intensive care unit
IHR	–	International Health Regulations
IMR	–	Infant mortality rate
INH	–	Isoniazid
KMC	–	Kangaroo mother care
LAg-Avidity EIA	–	Limiting-Antigen Avidity Assay
LiST	–	Lives Saved Tool
LPA	–	Line probe assay
MPAT	–	Management Performance Assessment Tool
M&E	–	Monitoring and evaluation
MDG	–	Millennium Development Goals
MDR-TB	–	Multidrug-resistant tuberculosis
MMC	–	Medical male circumcision
MMR	–	Maternal mortality ratio
MPAT	–	Management Performance Assessment Tool
MTB/RIF	–	Drug-resistant tuberculosis
MTCT	–	Mother-to-child transmission of HIV
MTSF	–	Medium-term Strategic Framework
MYE	–	Mid-year estimate
NAPHISA	–	National Public Health Institute of South Africa
NBD	–	National Burden of Disease [Study]
NCCEMD	–	National Committee for Confidential Enquiries into Maternal Deaths
NDoH	–	National Department of Health
NDP	–	National Development Plan
NGO	–	Non-governmental organisation
NHI	–	National Health Insurance

NHIS/SA	–	National Health Information System of South Africa
NHLS	–	National Health Laboratory Service
NICD	–	National Institute for Communicable Diseases
NIDS	–	National Indicator Data Set
NMR	–	Neonatal mortality rate
NSDA	–	Negotiated Service Delivery Agreement
NVP	–	Nevirapine
OHSC	–	Office of Health Standards Compliance
OPD	–	Outpatient Department
PCR	–	Polymerase chain reaction
PHC	–	Primary health care
PHC-PIS	–	Primary Health Care Patient Information Systems
PMTCT	–	Prevention of mother-to-child transmission of HIV
QRS	–	Quarterly Reporting Systems
RMS	–	Rapid Mortality Surveillance (RMS) System
RR-TB	–	Rifampicin-resistant tuberculosis
SABSSM	–	South African National HIV Prevalence, Incidence, Behaviour and Communication Survey
SADHS	–	South African Demographic and Health Survey
SAMRC	–	South African Medical Research Council
SANHANES	–	South African National Health and Nutrition Examination Survey
SAPMTCTE	–	South African Evaluation of the Programme to Prevent Mother-to-Child Transmission of HIV
SDG	–	Sustainable Development Goals
sdNVP	–	Syrup-dose nevirapine
Stats SA	–	Statistics South Africa
TB	–	Tuberculosis
TIER.Net	–	Three-tier HIV monitoring information system
U5MR	–	Under-five mortality rate
UN	–	United Nations
UNAIDS	–	Joint United Nations Programme on HIV/AIDS
VOICE	–	Vaginal + Oral Interventions to Control the Epidemic
VMMC	–	Voluntary medical male circumcision
VR	–	Vital Registration
WBPHCOT	–	Ward-based Primary Health Care Outreach Teams
WHO	–	World Health Organization

WITS	–	University of the Witwatersrand
WRHI	–	WITS Reproductive Health and HIV Institute
XDR-TB	–	Extensively drug-resistant tuberculosis
YLLs	–	Years of life lost

Executive summary

Established in 2010 to advise the Minister of Health, the Health Data Advisory and Co-ordinating Committee (HDACC) focused mainly on identifying high-level indicators to monitor the health-related outcomes of the Negotiated Service Delivery Agreement (NSDA) relating to Output 2: A long and healthy life for all South Africans. The committee reviewed the targets for the high-level indicators, and identified guiding principles for developing the indicators as well as the data sources for estimating these indicators, and provided baseline values for 2009 (HDACC, 2011).

The four outputs are:

Output 1: Increasing Life Expectancy

Output 2: Decreasing Maternal and Child Mortality rates

Output 3: Combating HIV and AIDS and Tuberculosis

Output 4: Strengthening Health Systems Effectiveness.

HDACC consolidated data for monitoring the high-level indicators and reported on progress achieved by 2012/13 since the 2009 baseline in its second report (HDACC, 2014). In the latter, the committee also reported on the further development of a framework to monitor the performance of health systems and for the first time, reported information on health systems financing and information gaps.

The current report of HDACC allows for reflection on the progress made on the NSDA targets over a four-year period, comparing the 2013 data with the baseline from 2009. In summary, the data show a mixed performance. Compared to the baselines that were set from 2009 data, there has been very good progress on ***Outputs 1 and 2 – Extending life expectancy and reducing maternal and child mortality***. The targets set for the five-year period have all been exceeded. A major contributor to this achievement has been the extensive roll-out of antiretroviral therapy (ART) and the implementation of the prevention of mother-to-child HIV transmission (PMTCT) programme. However, other factors such as pneumococcal and rotavirus immunisation may also have contributed to this. The Millennium Development Goal (MDG) targets for maternal and child mortality have, however, not yet been reached, and a lack of baseline data to monitor the nutritional status of children has made it impossible to assess progress in this regard.

In terms of ***Output 3: Combating HIV and AIDS and tuberculosis,*** some of the targets have been met while others have not. Of major concern is the lack of a clear indication of a reduction in the incidence of HIV over the period. While achievements have been made in the provision of treatment, unless the spread of the disease can be halted, the country

will be faced with an ever-growing challenge in health services. In addition, while there appears to have been some progress in the TB control programme, the high number of TB drug-resistant cases poses a key threat to TB control.

The performance on ***Output 4: Strengthening health systems effectiveness*** has been mixed, with evidence of some progress, but with few targets being met. It is not clear whether the targets were unrealistic, whether there were insufficient resources for implementation, or whether the mechanisms for health systems strengthening have thus far been inadequate to respond to the complexities of the health system.

Achievements of HDACC include the network of local institutions involved in the production and use of health data. The committee has advised government on high-level indicators, baselines and targets for the health outcomes of the NSDA, defined the relevant domains for measuring these and grappled with the data systems required to monitor them.

This report reflects on the indicators identified on the Medium-term Strategic Framework (MTSF) for the period 2014 to 2019, the Department of Health Strategic Plan 2015/16–2019/20 (NDoH, 2015) and the National Development Plan (NDP) 2030. Progress has been made on the identification of a comprehensive set of indicators required to monitor the performance of the health system, but the task has yet to be completed. This will need to be done with the future-oriented Sustainable Development Goals in mind.

Targets were set for the high-level NSDA indicators. Maintaining the balance between aspirational and incremental targets was challenging and it would have been ideal to use stronger methodologies, such as modelling, for setting targets to ensure consistency between targets, and linking them with planned programmes. Capacity for such an approach needs to be developed to review the targets set for the MTSF.

The need to strengthen elements of the health information system has been identified, as has the need for a strategic plan for population-based health surveys. HDACC also found it challenging to obtain the necessary data to monitor progress on the selected indicators, and has continually been 'behind the curve' with its reporting. Better co-ordination with the data producers would be helpful as would additional resources to undertake specific investigations to allow the committee to fulfil its advisory role more fully. It is recommended that the work of HDACC, and the processes HDACC has to follow in doing its work, be reviewed with the aim of defining the niche contribution that HDACC can make including its contribution to the monitoring of the Sustainable Development Goals (SDGs).

1. Introduction

The Health Data Advisory and Co-ordinating Committee (HDACC) was set up by the Director-General of the Department of Health in 2010 to advise the Minister of Health on improving the quality and integrity of data used to monitor health outcomes after the Minister had signed a Negotiated Service Delivery Agreement (NSDA) with the President. The current membership list is shown in Annexure 1 and the Terms of Reference are shown in Annexure 2.

In the first year, the committee focused mainly on identifying high-level indicators to monitor the health-related outcome of the NSDA relating to Output 2: A long and healthy life for all South Africans. The four outputs are:

Output 1: Increasing life expectancy

Output 2: Decreasing maternal and child mortality rates

Output 3: Combating HIV and AIDS and tuberculosis

Output 4: Strengthening health systems effectiveness.

HDACC agreed on guiding principles for developing the indicators, identified data sources for estimating these indicators and provided baseline values for 2009. The committee also attempted to set realistic targets for the high-level indicators and began to consider a framework to monitor the performance of the health system (HDACC, 2011).

During the second and third years, HDACC consolidated data for monitoring the high-level indicators and reported on progress achieved by 2012/13 since the 2009 baseline. The committee further reported on the development of a framework to monitor the performance of health systems, and for the first time, reported information on health systems financing. The report also reflected on information gaps (HDACC, 2014).

In this, third report, the committee attempts to review the progress made during the five-year NSDA period relative to the 2009 baseline. Subsequent to the compilation of indicators for this report, further data have been reported in NDOH annual reports. For ease of access, these updates are provided in Annexure 3. It also reflects on the indicators identified in the Medium-term Strategic Framework (MTSF) for the period 2014 to 2019, the Department of Health Strategic Plan 2015/16–2019/20 (NDoH, 2015) and the National Development Plan (NDP) 2030.

Following each electoral cycle, the government of South Africa develops a five-year plan known as the Medium-term Strategic Framework (MTSF), which is linked to the term of

office of government, and which outlines in detail the government's programmes for delivering on the commitments made during elections. The MTSF 2014–2019 was adopted by Cabinet in December 2014. The MTSF 2014–2019 is aligned with the country's macro plan, the National Development Plan 2030, adopted in 2012.

The government of South Africa has identified 14 priority outcomes, which are embodied in the NDP together with the key actions and targets to be achieved by 2030. In terms of health, the NDP envisions a health system that works for everyone and is not out of reach. The NDP asserts that it is possible by 2030 for South Africa to have:

(a) raised the life expectancy of South Africans to at least 70 years;

(b) ensured a generation of under-20s that is largely free of HIV;

(c) reduced significantly the prevalence of non-communicable disease, and

(d) achieved an infant mortality rate of fewer than 20 deaths per 1 000 live births, including an under-5 mortality rate of fewer than 30 deaths per 1 000 live births.

To attain this vision, the NDP 2030 sets out nine goals, namely:

(a) Raise the life expectancy of South Africans to at least 70 years

(b) Progressively improve TB prevention and cure

(c) Reduce maternal, infant and child mortality

(d) Significantly reduce the prevalence of non-communicable disease

(e) Reduce injury accidents and violence to 50% of 2010 levels

(f) Complete health systems reforms

(g) Deploy primary health care teams to provide care to families and communities

(h) Provide access to an equal standard of care for everyone, regardless of cost

(i) Fill posts with skilled, committed and competent individuals.

The MSTF 2014–2019 is the first five-year implementation phase of the NDP 2030. It encompasses 10 key priority areas or sub-outcomes focused on health systems strengthening and reducing the burden of disease:

Sub-outcome 1: Universal health coverage progressively achieved through implementation of National Health Insurance

Sub-outcome 2: Improved quality of health care

Sub-outcome 3: Implement the re-engineering of primary health care

Sub-outcome 4: Reduced health care costs

Sub-outcome 5: Improved human resources for health

Sub-outcome 6: Improved health management and leadership

Sub-outcome 7: Improved health facility planning and infra-structure delivery

Sub-outcome 8: HIV and AIDS and tuberculosis prevented and successfully managed

Sub-outcome 9: Maternal, infant and child mortality reduced

Sub-outcome 10: An efficient Health Management Information System developed and implemented for improved decision-making.

The MTSF has identified **nine high-level impact indicators** and outlines **2019 targets**:

Impact Indicator	Minister responsible	Baseline 2009[20]	Baseline[21] 2012	2019 targets
Life expectancy at birth: Total	Minister of Health	56.5 years	60.0 years (increase of 3,5years)	63 years by March 2019 (increase of 3 years)
Life expectancy at birth: Male	Minister of Health	54.0 years	57.2 years (increase of 3,2 years)	60.2 years by March 2019 (increase of 3 years)
Life expectancy at birth: Female	Minister of Health	59.0 years	62.8 years (increase of 3,8years)	65.8 years by March 2019 (increase of 3years)
Under-6 Mortality Rate (U5MR)	Minister of Health	56 per 1,000 live-births	41 per 1,000 live-births (25% decrease)	23 per 1,000 live-births by March 2019 (20% decrease)
Neonatal Mortality Rate	Minister of Health	-	14 per 1000 live births	6 per 1000 live births
Infant Mortality Rate (IMR)	Minister of Health	39 per 1,000 live-births	27 per 1,000 live-births (25% decrease)	18 per 1000 live births
Child under 5 years diarrhoea case Fatality rate	Minister of Health	-	4.2%	<2%
Child under 5 years severe acute malnutrition case fatality rate	Minister of Health	-	9%	<5%
Maternal Mortality Ratio	Minister of Health	304 per 100,000 live-births	269 per 100,000 live-births	Downward trend <100 per 100,000live-births by March 2019

(*The 2019 target for the U5MR is incorrectly specified as 23 rather than 33 per 1,000 live births).*

Source: The Presidency, 2014

Through the Programme of Action (POA) progress reports, the Presidency monitors the implementation of the MTSF 2014–2019 on a quarterly basis. The National Department of Health has aligned its Annual Performance Plans and its Strategic Plan 2015–2020 with the NDP 2030, as shown in the following extract from the Annual Performance Plan (APP).

5.4. Alignment between NDP Goals, Priorities and NDoH Strategic Goals

NDP Goals 2030	NDP Priorities 2030	NDoH Strategic Goals 2014- 2019
Average male and female life expectancy at birth increased to 70 years	a. Address the social determinants that affect health and diseases d. Prevent and reduce the disease burden and promote health	Prevent disease and reduce its burden, and promote health through a multi stakeholder National Health Commission
Tuberculosis (TB) prevention and cure progressively improved;		
Maternal, infant and child mortality reduced		
Prevalence of Non-Communicable Diseases reduced		
Injury, accidents and violence reduced by 50% from 2010 levels		
Health systems reforms completed	b. Strengthen the health system	Improve health facility planning by implementing norms and standards;
		Improve financial management by improving capacity, contract management, revenue collection and supply chain management reforms;
	c. Improve health information systems	Develop an efficient health management information system for improved decision making;
	h. Improve quality by using evidence	Improve the quality of care by setting and monitoring national norms and standards, improving system for user feedback, increasing safety in health care, and by improving clinical governance
Primary health care teams deployed to provide care to families and communities		Re-engineer primary healthcare by: increasing the number of ward based outreach teams, contracting general practitioners, and district specialist teams; and expanding school health services;
Universal health coverage achieved	e. Financing universal healthcare coverage	Make progress towards universal health coverage through the development of the National Health Insurance scheme, and improve the readiness of health facilities for its implementation;
Posts filled with skilled, committed and competent individuals	f. Improve human resources in the health sector g. Review management positions and appointments and strengthen accountability mechanisms	Improve human resources for health by ensuring appropriate appointments, adequate training and accountability measures.

Extract: NDoH, 2015

In the context of evolving policies, HDACC continues to aim to provide guidance on high-level indicators for ***Outcome 2: A long and healthy life for all South Africans***. Non-communicable diseases, injuries and nutrition have been added to the health and development policy agenda and should be included in HDACC's measurement activities.

At the global level, 2015 marked the final year of the Millennium Development Goals (MDGs) era. The MDGs have served to focus attention on eight goals and 21 targets with 48 indicators. Health played a dominant role in this vision of development, accounting for three of the goals and reflecting the prevailing consensus that health and education were critical drivers of a country's progress. It is clear that the MDGs enabled the galvanisation of concerted actions and consequently progress was accelerated in many settings. However, there is agreement that there is still a need to commit to the full realisation of MDGs, particularly in low-income countries.

Extensive consultations to define the post-2015 development agenda culminated in the UN Sustainable Development Summit held from 25 to 27 September 2015 and the adoption of 17 Sustainable Development Goals (SDGs) by the UN General Assembly (United Nations, 2015). These aim to guide development in the next 15 years and seek to realise the human rights of all. The SDGs look more broadly at sustainability and improving quality of life and aim to balance the three dimensions of sustainable development: the economic, social and environmental. A total of 169 targets to be met by the 2030 have been adopted.

The third goal, ***to ensure healthy lives and promote well-being for all at all ages***, is focused directly on health, but the other goals embrace many issues that will impact on health. The health goal includes 13 sub-goals which embed the completion of the MDGs, ensure universal access to health care and address adult health concerns beyond HIV/AIDS, TB and malaria as well as reproductive health and environmental health. The inter-linkages and integrated nature of the SDGs form an important aspect of the new agenda, as does the recognition of importance of reducing inequalities.

The UN declaration notes that national ownership is key to achieving sustainable development and the foundational role of the national-level review processes and country statistics. The indicators to monitor the SDGs are expected to be finalised early in 2016. HDACC will need to assess the global indicators and advise on the processes for monitoring them.

2. Outputs 1 and 2: Extending life expectancy and reducing maternal and child mortality

High-level indicators related to life expectancy and maternal and child mortality for Outputs 1 and 2 have been updated in Table 1. Most of the estimates come from the Rapid Mortality Surveillance (RMS) report for 2013 based on deaths from the National Population Register, adjusted for under-registration of deaths as well as the proportion of the population who are not on the population National Population Register. Until 2011, the reports of RMS indicators were calculated using the Actuarial Society of South Africa's 2008 (ASSA2008) population estimates. Analysis of the 2011 Census revealed higher levels of in-migration and a different trend in fertility than had been allowed for in the ASSA2008 population estimates, and thus the indicators were subsequently revised using a set of mid-year estimates consistent with the migration reported by, and age distribution observed of, the 2011 Census (Dorrington, 2013). It was therefore necessary to revise the actual 2014 target value to ensure consistency with the series. Although there are other estimates for these indicators, it was considered that the method adopted in the RMS report best satistifed the critiera identified by HDACC for producing a suitable consistent series for monitoring progress (HDACC, 2011).

It can be seen from Table 1 that there have been steady improvements in mortality in South Africa, with the 2014 targets achieved for all the indicators.

Life expectancy (1.1)

Estimates for 2013 show that the average life expectancy in South Africa has reached 62 years, an increase of five and eight years since the baseline in 2009 and the low in 2005, respectively. The improvement has occurred for both males and females but is still somewhat short of the estimated global average of 71 years (WHO, 2015). The increase in life expectancy is due to a drop in the levels of child as well as adult mortality.

Table 1: Health sector outputs, indicators, targets, values and data sources (Outputs 1 and 2)

OUTPUT	INDICATOR	TARGET 2014	BASELINE 2009	2010	2011	2012	2013	SOURCE OF DATA
1.INCREASING LIFE EXPECTANCY								
	1.1 Life expectancy at birth	59.1 Male 56.6 Female 61.7 (an increase of 2 years)	57.1 Male 54.6 Female 59.7	58.5 Male 56.0 Female 61.2	60.5 Male 57.8 Female 63.2	61.2 Male 58.5 Female 64.0	62.2 Male 59.4 Female 65.1	Rapid Mortality Surveillance Report
	1.2 Adult mortality ($_{45}q_{15}$)	43% Male 48% Female 37% (10% reduction)	46% Male 51% Female 40%	43% Male 48% Female 38%	40% Male 46% Female 35%	38% Male 44% Female 32%	36% Male 42% Female 30%	Rapid Mortality Surveillance Report
2. DECREASING MATERNAL AND CHILD MORTALITY								
	2.1 Under-five mortality rate (U5MR)	50 per 1 000 live births (10% reduction)	56 per 1 000 live births	52 per 1 000 live births	40 per 1 000 live births	41 per 1 000 live births	41 per 1 000 live births	Rapid Mortality Surveillance Report.

OUTPUT	INDICATOR	TARGET 2014	BASELINE 2009	2010	2011	2012	2013	SOURCE OF DATA
	2.2 Infant mortality rate	35 per 1 000 live births (10% reduction)	39 per 1 000 live births	35 per 1 000 live births	28 per 1 000 live births	27 per 1 000 live births	29 per 1 000 live births	
	2.3 Neonatal mortality rate (<28 days)	12 per 1 000 live births (10% reduction)	14 per 1 000 live births	13 per 1 000 live births	13 per 1 000 live births	11 per 1 000 live births	11 per 1 000 live births	Rapid Mortality Surveillance Report
	2.4 Maternal mortality ratio	252 per 100,000 live births (reverse increasing trend and achieve 10% reduction)	2008 281 per 100 000 live births	2009 302 per 100 000 live births	2010 267 per 100 000 live births	2011 200 per 100 000 live births	2012 166 per 100 000 live births 155	Rapid Mortality Surveillance Report
	2.5 Prevalence of underweight among children ≤59 months	5% reduction (1% per year)	No baseline	No data	No data	2012: 5.5% [95% CI 4.0-6.9]	No data	SANHANES
	2.6 Prevalence of stunting among children ≤59 months	5% reduction (1% per year)	No baseline	No data	No data	2012: 21.6% [95% CI 18.9-24.4]	No data	SANHANES

Adult mortality (1.2)

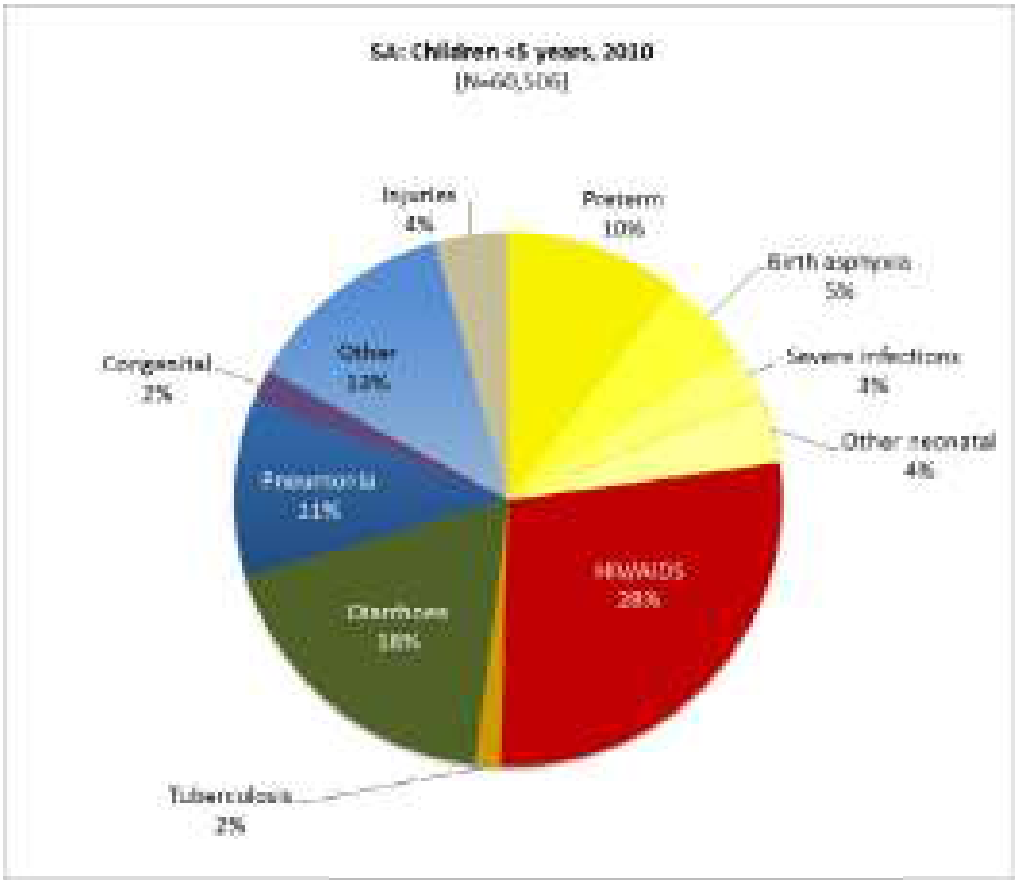
The adult mortality rate ($_{45}q_{15}$) has decreased from 46% in 2009 to 36% in 2013 with similar decreases for males and females. Thus the NSDA target of 43% by 2014 was already exceeded by 2011. The provision of ART is probably the main contributor to this improvement. The adult mortality rate for males is somewhat higher than that for females (42% vs. 30%). These rates are much higher than the global average adult mortality rates which are estimated to be 19% for males and 13% for females (WHO, 2015).

Child mortality (2.1–2.3)

Although the infant and under-five mortality rates in South Africa are lower than the global average (29.0 vs. of 33.6 infant deaths per 1 000 live births and 41.0 vs. 45.6 under-five deaths per 1 000 live births), compared to the levels in 2011 the infant and under-five mortality rates in South Africa have stagnated. In contrast, neonatal mortality rates have continued a very gradual improvement since 2009 and are now at 11 per 1 000 live births. Although there is some uncertainty as to the exact level of the neonatal mortality, at current levels of infant mortality, it is unlikely to be much above 15, somewhat lower than the global average estimated by WHO at 20 neonatal deaths per 1 000 live births (WHO, 2015).

The National Population Register does not include information about the cause of death (other than a crude division between natural and non-natural deaths). Annual cause-of-death statistics are compiled by Stats SA based on death notifications incorporating a medical certificate on the cause of death (Stats SA, 2014). In 2013, a total of 35 094 under-five deaths were registered, a drop from 52 010 in 2009. However, about 14% of the under-five deaths were ascribed to ill-defined natural causes, with 13% in 2009 and 15% in 2013. Furthermore, not all deaths are registered and HIV deaths are under-reported. The 2nd National Burden of Disease Study used the cause-of-death data from Stats SA but made adjustments for under-registration of deaths and the misclassification of causes to provide estimates of the causes of death (Pillay-van Wyk et al., 2014). National estimates of the causes of death of children under-five years (Figure 1) show that HIV/AIDS accounted for 28% of the under-five deaths (Msemburi et al., 2014). Neonatal conditions accounted for 23% of the deaths in 2010. Complications from pre-term birth, birth asphyxia and severe infections were the three main causes of death in this age group. Diarrhoeal diseases accounted for 18% and lower respiratory infections (pneumonia) accounted for 11%. The childhood deaths are often aggravated by malnutrition and a high proportion of the deaths are preventable.

Figure 1: Estimated causes of death of children under five years, South Africa 2010



Source: 2nd National Burden of Disease Study

Based on the analysis of Saving Babies 2010–2011 data on perinatal deaths, Lloyd and de Witt (2013) discuss the opportunities for reducing neonatal mortality in South Africa. They raise the possibility that some regions may have insufficient neonatal intensive care unit (ICU) beds or inadequate referral systems and problematic transport systems. They highlight that simple preventative measures including training healthcare providers on resuscitation, promoting breastfeeding and Kangaroo mother care (KMC) programmes, and the use of polyethylene wrappings for neonates <1 200g would be effective interventions. The use of non-invasive ventilation at district hospitals could also be implemented, provided that target saturation protocols are in place, especially for pre-term infants, as can the use of antenatal steroids at the time of premature delivery. The Saving Babies 2012–2013 report reiterated the need for knowledgeable and skilled healthcare providers, appropriately resourced healthcare facilities (including equipment and human resources) and rapid inter-facility emergency transport systems (Pattinson and Rhode, 2014). They also highlighted

the need to improve quality of care through the District Clinical Specialist Teams to improve clinical governance, clinical supervision, response to local audit finding, and leadership functions.

The 2nd triennial report of the Committee on Morbidity and Morbidity of Children Under-5 years (CoMMiC, 2014) has focused on issues of access to health care. They urge that work on the Essential Package of Care be completed, emphasise that Ward-based Outreach Teams should ensure health promotion and disease prevention activities, and highlighted the need for capacitation of healthcare workers. They draw attention to the importance of early childhood development and the first 1 000 days of life, and recommend that the Road-to-Health booklet be used as the health record for each child. They also call for the introduction of standard data sets for children for monitoring, evaluation and feedback.

Maternal mortality ratio (2.4)

From Table 1, it can be seen that the maternal mortality ratio peaked in 2009 (302 per 100 000 live births), whereafter it declined substantially to 166 per 100 000 live births in 2012 – a level below the NSDA target. According to the Saving Mothers Report 2010–2013, the institutional maternal mortality ratio (iMMR) decreased from 176 per 100 000 live births in 2008–2010 to an iMMR of 154 per 100 000 live births in 2011–2013 (NCCEMD, 2014). Tracking the causes of maternal death in the 2nd National Burden of Disease Study, it was observed that there was a substantial increase in the number of indirect maternal deaths, which began in 2003 and peaked in 2008. The Saving Mothers Report noted that there was a significant reduction in deaths due to complications of antiretroviral therapy. The NCCEMD emphasises the need for knowledgeable and skilled healthcare providers, appropriately resourced and accessible healthcare facilities (including equipment and human resources) as well as rapid inter-facility emergency transport systems to further reduce maternal mortality.

Modelling the impact of effective interventions using the Lives Saved Tool (LiST) has clearly demonstrated the potential for saving the lives of mothers, newborns and children. At the height of the AIDS epidemic, the work by Chopra et al. (2009) emphasised the impact of prevention of mothe- to-child transmission of HIV. More recently, Chola and colleagues (2015a) have demonstrated that a suite of 15 interventions would have a major impact on further reducing maternal deaths and child mortality, including diarrhoea (2015b). Using a complementary Family Planning module (FamPlan) in Spectrum, Michelow et al. (2015) have demonstrated the additional impact of these interventions on reducing the loss from stillbirths, highlighting a substantial return on investment. The authors note that family planning should also be prioritised to reduce mortality and overall costs.

Nutritional status of children (2.5–2.6)

While there are no additional data for monitoring trends in childhood under-nutrition, a diagnostic and implementation evaluation of government-driven nutrition programmes targeting children under five years was undertaken by the Department of Health, the Department of Programme Monitoring and Evaluation and the Department of Social Development (DOH, DPME, DSD, 2014). The evaluation has stressed the importance of malnutrition in childhood as it results in continued ill health, poor cognitive abilities and reduced productivity into adulthood. It pointed out that the most critical time for nutrition is the first 1 000 days of life – between conception and a child's second birthday. The high levels of stunting are creating a debilitating and intergenerational problem for South Africa in terms of longevity, educational outcomes and productivity of people, and its related contribution to economic growth. Furthermore, SANHANES-1 has revealed that there is also a growing obesity problem in children aged two to five years, with 18.9% of girls being overweight and 4.9% obese, and 17.5% of boys being overweight and 4.4% obese (Shisana et al., 2014). The diagnostics and implementation evaluation (DOH, DPME, DSD, 2014) has identified the need for stronger co-ordination of programmes to address nutrition. They recommend that a National Nutrition Plan be developed and that a Nutrition Council be established.

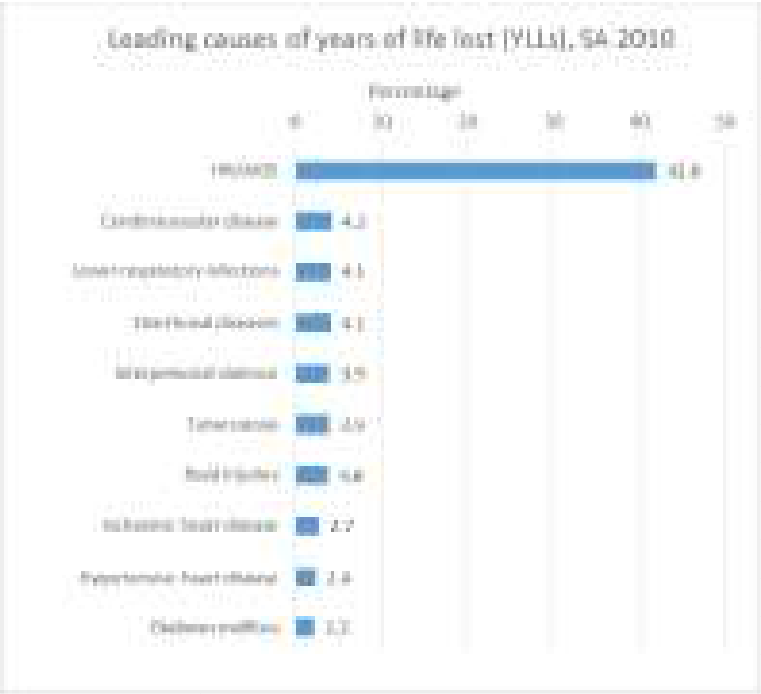
Burden of disease

To improve life expectancy further, it is important to know the major causes of death and the changes that are under way. The 2nd National Burden of Disease Study has estimated trends in cause of death after adjusting for under-registration and misclassification of cause (Pillay-van Wyk et al., 2014). Estimates show that in 2010, HIV/AIDS remained the leading single cause of death and accounted for 42% of premature mortality measured as years of life lost (YLLs). The top 10 causes of premature mortality are shown in Figure 2. While HIV/AIDS dominates the loss of life experienced in 2010, there was a wide range of conditions contributing to premature mortality. In addition to HIV/AIDS and TB, these feature non-communicable diseases such as cerebrovascular disease, ischaemic heart disease, hypertensive heart disease and diabetes mellitus, other infectious diseases such as lower respiratory infections and diarrhoeal diseases, and injuries arising from interpersonal violence and road traffic collisions.

It would be ideal for the National Burden of Disease (NBD) study approach to be applied routinely with annual updates on the estimated cause of death profile. In the meanwhile, unit record cause of death data from Stats SA have been used by the Department of Health to track more recent trends of major cause groupings (Figure 3). These include major infectious diseases (HIV/AIDS, TB, pneumonia and diarrhoea), cardiovascular conditions

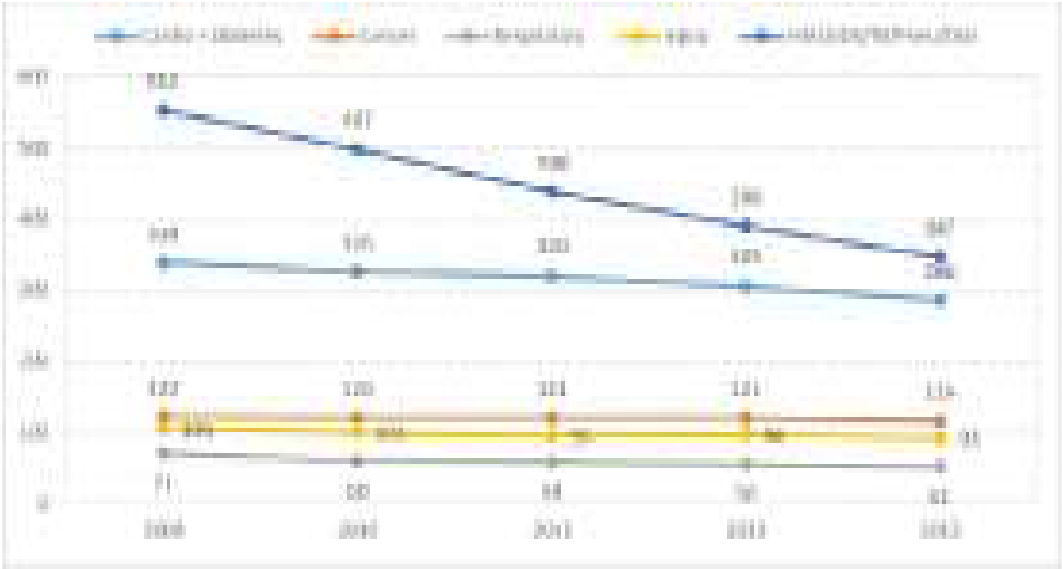
together with diabetes, cancers, chronic respiratory diseases, and injuries. Mortality rates reported in the Annual Health Statistics (2015) are calculated using mid-year population estimates produced by Dorrington (2013) and age-standardised to the World Health Organization (WHO) world standard (Ahmad et al., 2001).

Figure 2: Leading causes of years of life lost (YLLs), South Africa 2010



Source: 2nd National Burden of Disease Study

Figure 3: Age-standardised mortality rate from selected main causes of death, South Africa 2009–2013



Source: Annual Health Statistics, 2015

Review of indicators and targets

It is clear that the high-level indicators identified for the NSDA are relevant for the MSTF 2014–2019 and should not change. However, indicators related to non-communicable diseases and injuries need to be developed.

More challenging has been the setting of appropriate targets. It is important to identify motivational (aspirational) yet achievable targets, as these can help focus programmes and service delivery to achieve the best possible outcomes. Without a full intervention model to quantify the impact of potential interventions, it has been difficult to set such targets. At the beginning of the NSDA period, HDACC made use of the ASSA2008 model to temper the original NSDA targets. This model underestimated the extent of the provision of antiretroviral drugs (ARVs) and its use clearly erred on the side of caution. Until comprehensive impact models (preferably coupled with costing) are developed and applied, setting of targets will remain challenging. Nonetheless, information about the recent trends, as well as work done using the LiST model for interventions on maternal and child health and on the Thembisa model for HIV-related interventions, are helpful in reviewing proposed targets. These insights have already been incorporated in the MSTF targets.

Future HDACC activities

Government's strategic initiative to improve Civil Registration and Vital Statistics (CRVS) is noted. In the meanwhile, there is a need to benchmark the indicators. The forthcoming Demographic and Health Survey will be of great use in evaluating the estimates of the neonatal, infant and under-five mortality rates as well as the maternal mortality ratio. The survey will also provide information on the nutritional status of children.

Population estimates are essential to provide the denominator for the calculation of these indicators. The implications of the 2011 Census on population estimates needs to be fully reviewed. A further issue that should be addressed by HDACC is identifying the best methodology for estimating these indicators at the sub-national level. This is particularly important as national averages mask some of the inequities experienced in South Africa.

There is a need to investigate the cause-of-death data. In recent years, there has been an impressive improvement in the turnaround time for production of the cause-of-death reports with, for example, the 2013 deaths being reported before the end of 2014. However, there are some concerns that the completeness of reporting/processing of the Vital Registration (VR) data since 2011 may have declined. This needs to be investigated as part of the strategic initiative to improve CRVS.

3. Output 3: Combating HIV and AIDS and tuberculosis

In the 2nd HDACC report it was noted that considerable progress had been made with the implementation of the National Strategic Plan (NSP) for HIV, STIs and TB 2012–2016 (NDoH, 2011) and the extensive roll-out of ART. The challenge of monitoring the incidence of HIV – a key indicator needed to track progress in prevention – was highlighted, as were concerns about the TB control programme and the data used to monitor it. In addition to incidence of HIV, HDACC identified strengthening the PMTCT programme as an important strategy to be monitored. The transmission of HIV from mother to child was identified as the key impact indicator and the proportion of HIV-positive pregnant women initiated on ART was identified as a strategic indicator of an intervention that would have significant impact on child and maternal mortality. In terms of TB, HDACC identified two indicators focused on outcomes of the TB control programme, an indicator focused on the management of drug-resistant TB (DR-TB), and a final indicator to track the management of HIV/TB co-infection. Table 3 provides an update of the indicators for monitoring Output 3 of the NSDA for the period 2009–2013. Data issues as well as additional indicators for future monitoring are discussed. Given the severity of the impact of drug-resistant TB, it is suggested that the success rate for DR-TB as well as the primary defaulter rate be considered for future monitoring.

Estimated incidence of HIV in women aged 15–49 years (3.1)

HDACC recommended that the incidence of HIV be tracked on an annual basis by a calculation based on prevalence results obtained from the antenatal HIV prevalence survey of pregnant women adjusted to represent the population of all women aged 15–49 years. This was to be done by making use of the fact that the survey in one year represented cohorts of women who were a year older than they were in the preceding survey, as well as allowing for the fact that the survey covers a selected population. The major weakness of any method used to produce these estimates is the need to estimate the adjustment needed to convert the antenatal survey prevalence to a prevalence of all women aged 15–49 years. The method used to produce the results in the previous report fitted a trend line to adjustment factors estimated using results from the household prevalence surveys in 2005 and 2008. After the release of the prevalence results from the the 2012 South African National HIV Prevalence, Incidence, Behaviour and Communication Survey (SABSSM IV) (Shisana et al., 2014), it was apparent that the method HDACC was using to estimate incidence on an annual basis was quite inaccurate, mainly because of inaccuracy in extrapolating the pregnant women to all women bias beyond the most recent household prevalence survey.

After much investigation, it was decided rather to determine the adjustment by estimating the expected age-specific bias in antenatal estimates from the Thembisa model (Johnson, 2014) in 2016, assuming that the biases in each of the years between 2012 and 2016 followed a linear trend between the bias estimated from the 2012 HSRC survey and that estimated by the model for 2016. In addition, since projecting bias for prevalence rates at both the start and the end of the year contributes to variability of the estimates of incidence, the method was changed to a 'variable-r' approach (Timæus, unpublished) which requires only one series of projected bias rather than projections of the bias of the antenatal survey prevalence for both of the 15–49 (at the start of the year) and 16–50 (at the end of the year) age groups.

While high incidence rates have been observed in selected populations (e.g., ARV for prevention studies among young women: VOICE, FACTS), national estimates are lower. The SABSSM survey measured the HIV incidence in 2012 using the newly developed Limiting-Antigen Avidity Assay (LAg-Avidity EIA) and estimated it to be 2.28% (95% CI: 1.84%–2.74%), higher than the HDACC estimate for that year derived from the national antenatal survey.[1] Incidence has been estimated from prevalence data using a synthetic cohort method (Rehle et al., 2010). Rehle et al. (2015) conducted a critical appraisal of different estimates of HIV incidence and found that assay-based estimates produced slightly higher estimates than did the model-based estimates (Table 2).

Table 2: Comparison of estimates of HIV incidence among women 15–49 years

Source	Method	Period	HIV Incidence Women 15–49 years
HDACC	Variable-r for cohort calculation on adjusted antenatal survey	2008/10 2012/13	2.1% 1.2%
HSRC	Lag avidity/ ARV testing/VL testing	2012	2.38% (1.84%-2.74%)
	Synthetic cohort	2008–12	2.10% (1.0%-3.4%)
Thembisa	Mathematical model	2011/12	1.88% (1.48%-2.28%)
EPP/Spectrum	Mathematical model	2011/12	1.78% (1.67%-1.90%)

Source: Adapted from Rehle et al., 2015

[1]As cautioned in previous reports, the interval of uncertainty about the estimate for a single year is very large and thus one should not read too much into such comparisons.

The evidence about trends in incidence during this period is mixed. Using the 'variable-r' approach to estimate annual incidence, there is substantial year-on-year variation and no clear indication of a downward trend in the incidence of HIV among women aged 15–49 years during this period. Examination of the data by smaller age divisions (which are not reported as indicators because the uncertainty is larger due to the smaller numbers) suggests that incidence appears to have declined slightly over the period in the 15–29-year age group. While a declining trend in the incidence is estimated by the models – Thembisa estimates the drop from 2.19% (1.70%–2.67%) in 2008/09 to 1.88% (1.48%–2.28%) in 2011/12, and EPP/Spectrum estimates the drop from 2.15% (2.06%–2.26%) in 2008/09 to 1.78% (1.67%–1.90%) – the confidence intervals are wide enough to allow for the possibility that there has been limited or no decline and the assay-based approach used in the SABSSM surveys, showed no change in the incidence among women aged 15–49 years (Rehle et al., 2015). The lack of a clear downward trend in the incidence is a matter of significant concern and indicates that prevention efforts need to be strengthened.

Rate of mother-to-child transmission of HIV <2 months of age (3.2)

The South African Evaluation of the Programme to Prevent Mother-to-Child Transmission of HIV (SAPMCTE) surveys have provided national estimates of the transmission of HIV from mother to child, producing estimates of the rate of 3.5% (95%: CI 2.9% – 4.1%) in 2010 (Goga et al., 2012a), 2.7% (95%: CI 2.1% – 3.2%) in 2011 (Goga et al., 2012b) and 2.6% (95%: CI 2.0% – 3.2%) in 2012–2013 (Goga et al., 2015). The initial reduction that has been seen in MTCT plateaued in 2011–2013, but further reductions may be anticipated following changes to the PMTCT guidelines effected in 2013. Both District Health Information System (DHIS) and National Health Laboratory Services (NHLS) data show a decline in MTCT. It is anticipated that the target of MTCT rates <2% by 2014 could be reached – the DHIS reported the infant 1st PCR test positive around 6 week rate to be 1.5% in 2014/15 (see Annexure 3 and Massyn et al., 2015).

It remains a challenge that the existing measure of the transmission rate from mother to child is based on a six-week polymerase chain reaction (PCR) assay which does not capture the proportion of infants infected through breastfeeding after six weeks. This is a concern, as mixed feeding, a risk factor for HIV transmission and an established practice throughout the country, may have become more common since the withdrawal of free breast milk substitutes from the public sector. A new indicator to monitor rates of mother-to-child transmission which takes into account birth testing, confirmatory positive tests and 10-week PCR tests will need to be included in future HDACC reports.

An additional indicator being considered by HDACC is the proportion of HIV-positive children enrolled into treatment programmes, as current informal estimates suggest that a high proportion of these children are being missed. In the previous HDACC report, concerns were raised that HIV-infected infants are lost to care prior to initiation of ART. Going forward, infant HIV testing will be conducted at birth to ensure that infants who have acquired HIV through mother-to-child transmission are identified early and initiated on ART early. A second infant HIV PCR test is conducted at 10 weeks, reducing the risk of false-negative tests, as most infants will on be on combination ART HIV prophylaxis.

Proportion of eligible HIV-positive pregnant women initiated on ART (3.3b)

The 2010 SAPMTCT guidelines followed the WHO PMTCT Option A and recommended (for all HIV-positive pregnant women) maternal AZT prophylaxis from 14 weeks' gestation with sdNVP in labour and a stat dose of Truvada® (Tenofovir and Emtracitabine) immediately post-delivery or ART (if CD4 ≤350 cells/µl or Stage III/IV disease) (NDoH, 2010). All infants received NVP for six weeks if not breastfeeding or until one week following cessation of breastfeeding. The 2013 SAPMTCT guidelines (WHO PMTCT Option B) recommended immediate initiation of fixed-dose combination (FDC) ARVs for all newly diagnosed HIV-positive pregnant women, regardless of their cluster differentiation 4 (CD4) cell count. Life-long treatment is to be continued if CD4≤350 cells/µl or stage 3–4 disease are noted. If CD4>350 cells/µl are observed, FDC is stopped one week after breastfeeding stops. All infants received six weeks NVP (NDoH, 2013a).

The calculation of the indicator to monitor the provision of ART to eligible HIV-positive pregnant women was revised in the previous HDACC report, as the original indicator did not capture the required information correctly and and rose to exceed 100%. The proposed indicator is based on the number of antenatal clients initiated on ART divided by the estimated number who would be eligible, irrespective of the CD4 guideline. The indicator has been calculated as the total deliveries (including the births that occurred before arrival) less the estimated number of women on ART at first visit. The denominator has been calculated as the total deliveries (including the births that occurred before arrival) multiplied by the prevalence of pregnant women attending an antenatal clinic for the first visit, less the estimated number of women on ART at first visit[2].

The 2009 baseline proportion of HIV-positive pregnant women initiated on ART was estimated to be 10% and the target was set at 80%. There was a steady increase in the

[2] The number of women on ART at first visit is currently not reported by the DHIS and thus was estimated as the number of HIV-positive clients less the number of antenatal clients known to be HIV-positive but not on ART, the antenatal client HIV 1st test positive and the antenatal client HIV re-test positive. It has been recommened that the number be captured by the DHIS in future.

proportion to 27% in 2012 and a substantial increase in 2013 with the proportion reaching 68%, following the decision to provide ART to all pregnant women. (As of April 2013, all HIV-positive pregnant women qualify to receive ART; prior to that only pregnant women with CD4 <350/μL qualified for ART). While the target has not yet been reached, good progress has been made.

It should be noted that the DHIS has an indicator which is described as the proportion of eligible HIV-positive pregnant women initiated on ART. While the value of the indicator appears to be plausible, if slightly high, in recent years, at 76% in 2013 and 91.2% in 2014, the trends prior to this are not particularly meaningful since some of the denominator data elements were incomplete, resulting in artificially high indicator values.

The 2012/13 SAPMTCTE reported that 54.8% (52.6–57.0%) of mothers had received maternal ART during or before pregnancy, whilst 35.5% (33.3–37.6%) received ARV prophylaxis for mother and baby, resulting in an overall antiretroviral coverage (either ART or prophylaxis for mother and baby) of 90.3% (Goga et al., 2015). This implies that 78% of the women not on ART at the end of their pregnancy were initiated on ARVs, somewhat higher than the 68% estimated by HDACC from DHIS data. Several factors may explain this difference, including the selection bias of the SAPMTCTE survey, under-reporting in the DHIS, and different time periods being investigated.

Total number of patients (adults and children) on ART (3.4)

Considerable progress has been made with the roll-out of ART. By the end of 2009, it was estimated that just over 511 000 patients were on treatment. The CD4 cell count threshold for treatment changed from <200 cells/$mm^3$to <350 cells/mm^3in 2010. Clear guidelines for the provision of ART were issued by the NDoH in 2010 and according to the DHIS, there were more than 2,6 million people on treatment in 2013. These numbers do not include the services provided by the private sector or non-governmental organisations (NGOs) which would increase the number.

The availability of reliable statistics has been a matter of concern. A three-tier data system (paper-based, computer-based and web-based) has been set up and reporting of cohort data commenced from June 2012. Full implementation and reporting has taken some time. By 2015, the numbers of children and adults on treatment have been exported from TIER.Net to the DHIS.

Medical male circumcision (3.5)

While progress has been made, the relatively modest target for medical male circumcision (MMC) has not been reached. There is strong evidence of the potential role of MCC in

reducing the spread of HIV. Njeuhmeli et al. (2011) estimated the impact and cost of scaling up adult MMC for 13 countries, including South Africa. This study suggested that rapid scale-up of voluntary MMC (VMMC) would lead to a substantial reduction in HIV infections and lower health system costs through averted HIV care costs.

The roll-out of such a programme faces multiple logistical challenges, cultural barriers and public health messaging challenges. Evaluation of a programme in KwaZulu-Natal over the period 2010–2013 demonstrated the successful implementation of voluntary medical male circumcision (Wynn et al., 2015). However, the uptake was lower than had been projected, highlighting challenges around recruitment, transportation and co-ordination of a population-based initiative. Another study based in three facilities in KwaZulu-Natal revealed high attrition rates over time and suggested that the intensive three-visit post-operative review practice may not be feasible (Phili et al., 2014). A qualitative study based on focus-group discussions with men in rural KwaZulu-Natal found that VMMC is linked to perceptions of masculinity and male gender identity including sexual health, sexual performance and pleasure, possible risk compensation and self-identity (Humphries et al., 2015). Furthermore, focus-group discussions in the Western Cape have identified the risk that men may begin sex before complete healing has occurred and the researchers stress the importance of counselling strategies for the VMMC post-operative period (Toefy et al., 2015).

TB treatment and default (3.6–3.7)

Patient data pertaining to the drug-sensitive TB treatment programme is collected at treatment sites using paper-based TB registers, and collated into the electronic TB register (ETR.Net) at sub-district or district level and then summarised nationally. Indicators on treatment outcomes for cohorts of patients who enter the treatment programme are reported quarterly from the ETR.Net.

Although the information system is well established, concerns about the integrity of the ETR.Net data have been raised and discrepancies exist not only between the paper-based and electronic registers but also between the levels of ETR.Net from the initial to the final National ETR.Net database. An evaluation undertaken in 2009 showed that agreement on the HIV status of TB patients between the data sources was particularly poor (Podewils et al., 2015). More recent analysis suggests that the TB notifications (i.e. the number of cases registered for the start of treatment on ETR.Net) remain lower than microbiologically confirmed cases of pulmonary TB diagnosed by the NHLS (Nanoo et al., 2015), reflecting the initial loss to follow-up. However, the downward trend in notifications and microbiologically confirmed cases is similar.

Despite the shortcomings in the routine information, ETR.Net data reveal the proportion of all TB cases who were recorded to have successfully completed their treatment has continued to increase from 71.4% in 2009 to 76.1% in 2013. However, it is considerably lower than the target of 85%. There has been no improvement in the recorded secondary loss to follow-up (default) rate which stands at 6.7% for 2013. Increased community involvement and the introduction of Ward-based PHC Outreach Teams (WBPHCOT) (which were not functional during this reporting period) to trace those people lost to follow-up, should enable the target of <5% to be reached going forward. Such follow-up should be prioritised among the WBPHCOT activities.

It is noted that since the last HDACC report, efforts have been made to improve the TB control programme monitoring and evaluation. The Joint Review of the HIV, TB and PMTCT Programmes in 2013 highlighted areas of monitoring that needed to be strengthened (ND0H, 2013b). The review found that recording and reporting in the TB programme were not up to standard, data were unreliable and registers were not filled in according to requirements. The needs for training in recording and reporting, appointment of data capturers and training them to fill in data correctly, and ensuring that the data validation and verification process is in place were identified. Data management and feedback to improve services were identified as cross-cutting issues and recommendations were made to appoint trained data capturers. The ETR.Net has been revised and extensive training has been conducted, but it is still too early for these changes to reflect in this reporting period.

ART for TB and HIV co-infected patients (3.8)

The percentage of HIV-TB co-infected patients placed on ART upon completion of their drug-sensitive TB treatment has shown a consistent increase from the baseline of 26.4% in 2009 to 65.5% in 2013. However, it remains short of the target of 85%. The performance on this indicator has been influenced by the South African National HIV and AIDS treatment guidelines. Prior to 2010, HIV/TB co-infected patients were only eligible for ART at a CD4 cell count of <200 cells/mm^3; in 2010 the eligibility criteria changed to a CD4 cell count of <350cells/mm^3, and in 2013 all HIV/TB co-infected patients became eligible for ART with the latest guideline changes. The indicator reports on the percentage of all HIV/TB co-infected patients on ART and the increase are in part due to more HIV/TB co-infected patients becoming eligible for ART as the guidelines changed.

Review of the ETR.Net reveals poor correspondence between HIV data management systems, and likely under-reporting of this indicator by ETR.Net. Patient management registers and electronic databases for TB and HIV are still separate, adding to the difficulty in measuring this indicator accurately. A single data system or linkage of the separate systems with a unique patient identifier is essential if accurate data are to be obtained for HIV/TB co-infected patients. Despite the challenges with interpreting the trend shown by this indicator, the available data suggests that there has been a steady and continued increase in the number of HIV/TB co-infected patients who are being initiated on ART prior to completion of their tuberculosis treatment (Massyn et al., 2015).

From both the TB notification and the NHLS laboratory data it appears that TB numbers in South Africa peaked in 2008 and continue to show a downward trend; this has been associated with increased ART access, and the earlier introduction of ART at higher CD4 cell counts should increase this downward trend (Nanoo et al., 2015).

Naidoo et al. (2013) have highlighted the role of social factors in adherence to TB drugs and ART. They found that poverty, having one or more co-morbid health conditions, being at high risk for alcohol misuse and having a partner who is HIV-positive were predictors of non-adherence. Their study also found that tobacco use was an additional predictor for non-adherence to anti-TB drugs. Despite free TB diagnosis and treatment, TB patients incur substantial costs related to their disease and those who are poor are pushed further into poverty. Consideration should be given to providing social support and financial protection for these patients to decrease default rates and improve treatment outcomes (Foster et al., 2015).

MDR-TB patients on treatment (3.9)

The proportion of MDR-TB patients who were enrolled on treatment has increased from 45.7% in 2009 to 75.4% in 2013. However, the data for this indicator have been erratic from year to year, reflecting data quality issues as well as raising concerns about the development of further drug resistance. Multidrug-resistant TB (MDR-TB) is defined as resistance to the both INH and rifampicin, while extensively drug-resistant TB (XDR-TB) is defined as resistance to INH, rifampicin, second-line injectables and quinolones. With increasing resistance, there is a worsening of prognosis. Non-adherence to therapy in an individual is the original cause of the development of resistance in TB and this is termed ‘acquired resistance’. However, resistant organisms can be transmitted and there is evidence that the proportion of transmitted cases is on the increase. In an elegant study presented at the Conference for Retroviruses and Opportunistic Infections in February

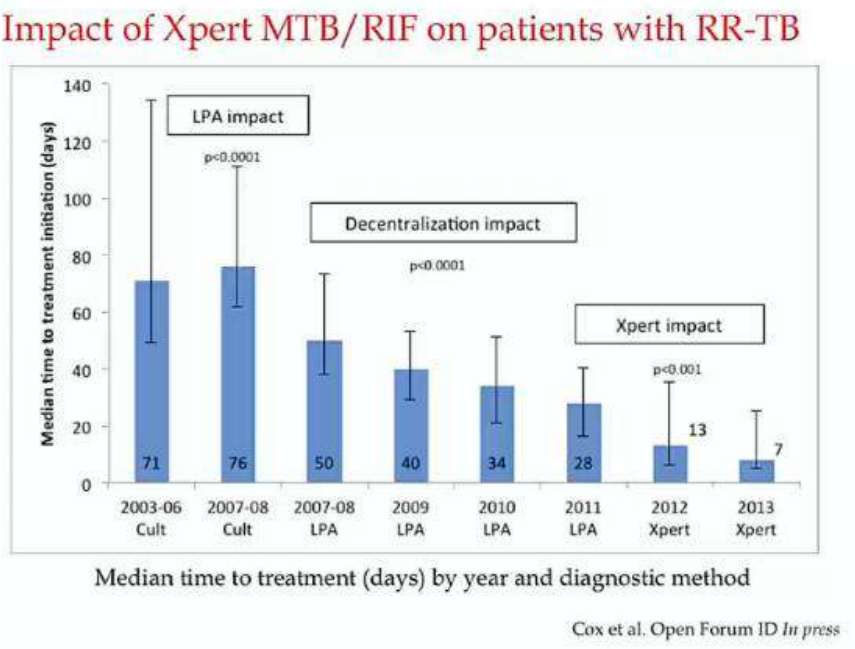
2015, Shah and colleagues showed that 79% of cases of XDR-TB diagnosed from August 2011 to November 2014 in KwaZulu-Natal were transmitted. Studies conducted in the Western Cape suggest that XDR-TB was acquired following the transmission of MDR-TB (Streicher et al, 2015).

The treatment of MDR-TB requires a minimum of 18 months of at least five medications and includes a six-month period of intramuscular injections. Outcomes are measured after 24 to 36 months and in most provinces, successful outcomes occur in fewer than 50% of cases. Rapid tests to identify drug susceptibility are paramount.

There have been two recent significant changes in the approach to the treatment of MDR-TB. In August 2011, the NDoH published the Policy Framework on Decentralised and Deinstitutionalised Management for South Africa." The previous NDoH policy dictated that all laboratory diagnosed MDR- and XDR-TB patients be hospitalised in centralised MDR- and XDR-TB units until they had two consecutive negative TB cultures taken at least 30 days apart. Consequently, patients were hospitalised for many months and there were waiting lists for patients needing to be admitted to the centralised units. This delayed the initiation of treatment in some provinces for three or four months. In addition, several patients died before starting treatment. The rationale behind the framework was to provide treatment for some drug-resistant TB patients closer to their homes as outpatients.

The second significant change has been the method of diagnosis of MDR-TB. The GeneXpert MTB/RIF is a novel molecular test for TB. It was recommended as an initial TB diagnostic by the WHO for countries with high HIV prevalence and rifampicin-resistant TB, This recommendation was adopted by the South African NDoH in March 2011, and complete coverage was achieved by the end of 2013. Over 5 million GeneXpert MTB/RIF diagnostic tests have been performed in South Africa. Prior to 2011, the diagnosis of resistance was made on culture of the *mycobacterium tuberculosis.* The turnaround time for culture-based resistance tests is six weeks, resulting in a delay in starting appropriate therapy and possible ongoing transmission. This compares to a turnaround time of 48 hours with the GeneXpert MTB/RIF. With the improved more rapid diagnosis of rifampicin-resistant TB, more cases are being detected and the time to treatment initiation is decreasing, as is shown by data from Khayelitsha (Figure 4).

Figure 4: Median time to treatment of multi-drug-resistant TB patients



Source: Cox et al., 2015

While rifampicin-resistant TB (RR-TB) has a poorer outcome than drug-sensitive TB and is treated for up to 24 months with more toxic medications, more rapid diagnosis and initiation on treatment and retention in care can reduce morbidity, mortality and ongoing transmission. The NDoH formulated an algorithm for the diagnosis and confirmation of RR-TB. When resistance is detected, additional tests need to be undertaken to establish the extent of resistance and treatment must be initiated within five days. While there is little difference in the treatment of MDR-TB and RR-TB and the outcomes are very similar, only confirmed MDR-TB cases are reported on for this indicator.

Monitoring and evaluation of MDR-TB cases are accomplished through two data sources:

1. The denominator, the number of confirmed MDR-TB cases, is obtained from the NHLS data base. This indicator currently excludes patients with rifampicin resistance diagnosed with GeneXpert MTB/RIF who have not had further

specimens sent to the laboratory to confirm probable INH resistance. Futher weaknesses with this denominator are:

i) Non-compliance with the National Algorithm for diagnosis of TB with the GeneXpert results in an under-reporting of MDR-TB cases, as further specimens are not sent for the testing of INH resistance.

ii) The number of MDR-TB cases provided by the NHLS may include duplicates. Processes exist to avoid duplication but the lack of a mandatory unique identifier for patients means that there is still a possibility of double-counting. The NHLS uses a system of probabilistic matching to decrease duplication of the HIV data they report; application of this technology to the TB data would further decrease the chance of over-reporting by more effectively reducing double-counting. Given the importance of rifampicin in the treatment of TB, it is now recommended that all rifampicin-resistant cases are reported as rifampacin-resistant DR-TB and are treated as MDR-TB patients as per the National DR-TB guidelines. The DR-TB programme now reports on rifampacin-resistant cases (identified by GeneXpert MTB/RIF, LPA or culture). This indicator should change to rifampicin-resistant patients on MDR treatment, which would be in line with the DR-TB programme, is available from the NHLS and the new TB registers, and will not be influenced by non-adherence to the National Algorithm for diagnosis of TB with the GeneXpert.

2. The numerator, the number of patients initiated on MDR treatment, is sourced from the EDR.Web which is a web-based treatment monitoring database. Access and ability to enter into EDR.Web were prioritised at centralised sites. When decentralised care of MDR-TB was started, access and ability to enter into EDR.Web did not occur. Data are still recorded on paper registers at many decentralised facilities and then entered into the EDR.Web. The lack of MDR-TB cases initiated at decentralised sites being entered into the EDR.Web was identified as a large gap. The NDoH has increased training on the EDR.Web, and has improved access to decentralised sites. An extensive DR-TB data mop-up plan was developed and implemented. The mop-up and capturing of all DR-TB patients receiving treatment at decentralised sites has contributed to the increase of this indicator from 42% in 2012 to 75% in 2013.

Additional indicators for TB

The current indicators and targets identified for the NSDA remain relevant for the MSTF 2014–2019. However, certain indicators should be modified and additional indicators should be developed going forward. Two new indicators are suggested:

DR-TB treatment success (all cases)

An outcome indicator for DR-TB should be considered for inclusion in the next NSDA given the potential threat that DR-TB poses to South Africa if it is not addressed urgently. As with drug-sensitive TB, treatment success would be preferable to cure, given the large number of patients without pulmonary TB and the difficulties experienced in collecting multiple sputum samples from these patients towards the end of therapy. The proposed new indicator would be: DR-TB treatment success (all cases), where "all" refers to both pulmonary and extra-pulmonary DR-TB. As suggested, this would include all rifampicin-resistant TB and not be limited to MDR-TB.

Primary defaulter rate (drug-sensitive TB)

This indicator would track the number of confirmed drug-sensitive TB cases not started on treatment: 'diagnosed but untreated TB' represents a group of patients for which the health system has already made a substantial investment in but has not been followed through to completion. This group is a large contributor to ongoing TB transmission and mortality, and can be determined using the confirmed laboratory TB numbers from the NHLS vs. notification of TB cases from the TB register and ETR.Net. Currently estimated to be about 25%, this would be a strategic indicator that would focus attention on addressing a large gap within the current TB programme. The current ETR.Net report includes 'primary loss to follow-up', but only uses data from the TB register and ETR.Net, thus excluding all patients for whom TB is tested and are found to be TB-positive by a laboratory test and are not entered into a TB register.

The NSDA indicators should retain their high-level status. Important process indicators that influence the outcomes should be included in Programme Area Service Delivery Agreements at a national and provincial level. An example of such an indicator would be adherence to the National Algorithm for the diagnosis of TB with the GeneXpert.

Table 3: Health sector outputs, indicators, targets, values and data sources (Output 3)*

OUTPUT	INDICATOR	TARGET 2014	BASELINE 2009	2010	2011	2012	2013	SOURCE OF DATA
3. **COMBATING HIV AND AIDS**	3.1 Estimated incidence of HIV in 15–49-year-old women ***(the incidence for each year is over the year ending in October of that year)***	Evidence of consistent downward trend	2.1% (average of 3 years 2008–2010)	2.8%	1.2%	1.9%	1.2%	Estimated from HIV prevalence in 15–49-year-old pregnant women reported by annual antenatal HIV and syphilis surveys. Model calibrated using HSRC Household Survey results and Thembisa. NDoH/SAMRC/ HSRC/CARe
	3.2 Rate of mother-to-child transmission of HIV <2 months of age	<2%	NO BASELINE	3.5%	2.7%	2.6%	2.6%	PMTCT surveillance system (PCR-positive/Elisa-positive at <2 months of age) SAMRC
			8.4%	5.7%	3.7%	2.6%	2.2%	NHLS
			10.9%	7.6%	4.0%	2.5%	2.0%	DHIS NDOH

OUTPUT	INDICATOR	TARGET 2014	BASELINE 2009	2010	2011	2012	2013	SOURCE OF DATA
	3.3b Proportion of eligible HIV-positive pregnant women initiated on ART to end of breastfeeding (irrespective of CD4 count based on new clinical criteria)	80% (of eligible pregnant women to be initiated on ART irrespective of CD4 count)	10%	19%	26%	27%	68%	Numerator: DHIS data (antenatal client initiated on ART) Denominator: (Deliveries in facilities+ liveBBAs - antenatal client on ART at 1st visit*) *Not reported by DHIS, thus estimated: antenatal 1st visit total*ANC prevalence – {antenatal client known HIV but not on ART+antenatal client HIV 1st test positive+antenatal client HIV re-test positive} NDoH/SAMRC/ HSRC/CARe

OUTPUT	INDICATOR	TARGET 2014	BASELINE 2009	2010	2011	2012	2013	SOURCE OF DATA
COMBATING HIV AND AIDS (cont.)	3.4 Total number of patients (adults and children) on ART	2.5 million on treatment	511 000 by end of 2009 (currently on treatment)	784 000	1 406 000	2 148 322	2 264 975	Three-tier data system to be set up nationally to report from June 2012 in DHIS National DoH CCMT
	3.5 Medical male circumcisions	500 000 adolescent and adult males per annum	NO BASELINE	100 000 (estimate)	347 973	422 262	397 051	DHIS NDoH
DECREASING THE BURDEN OF TUBERCULOSIS	3.6 Proportion of TB treatment success among **all** TB cases*	85%	71.4%	72.5%	67.5%	73.9%	76.1%	ETR.Net Report: Summary treatment outcome for cohort: All TB cases NDoH
DECREASING THE BURDEN OF TUBERCULOSIS (cont.)	3.7 TB loss to follow-up (default) rate at the end of TB treatment among **all** TB cases*	<5%	7.3%	7.2%	6.2%	6.6%	6.7%	ETR.Net Report: Summary treatment outcome for cohort: All TB cases NDoH

OUTPUT	INDICATOR	TARGET 2014	BASELINE 2009	2010	2011	2012	2013	SOURCE OF DATA
	3.8 Percentage of HIV-TB co-infected patients who are on ART on completion of drug-sensitive TB treatment**	85%	26.4%	37.3%	48.8%	53.6%	65.5%	ETR.Net: TB/HIV Report NDoH
	3.9 Percentage of diagnosed MDR-TB patients who are enrolled in a TB treatment programme***	75%	45.7%	71.9%	54.7%	42.0%	75.4%	MDR treatment register NDoH

* Updated information can be found in Annexure 3.

** TB treatment outcome data are reported for the cohort commencing treatment in year indicated by the column, i.e. data only available 12 months later for drug-sensitive TB, and 24 months for drug-resistant TB.

*** The variation in this indicator probably reflects the fact that the data collection tool, EDR.Web, was introduced and implemented at different times in different provinces. There is a data mopping exercise in place to rectify this.

4. Output 4: Strengthening health systems effectiveness

Indicators selected for this output were identified to monitor the strategic and annual plans of the NDoH for achieving the NSDA 2010–2014 outputs. These were:

(i) Re-engineering primary health care
(ii) Improving patient care and satisfaction
(iii) Improving human resources for health
(iv) Strengthening financial management
(v) Introducing National Health Insurance (NHI) to protect South Africans against the catastrophic costs of health care
(vi) Strengthening health information systems.

These indicators have been updated for the period in Table 4 and show progress in some aspects but also reflect several targets that have not been met.

Re-engineering PHC system (4.1-4.6)

The Department is strengthening primary health care (PHC) through re-engineering by (1) establishing District Clinical Specialist Teams (DCSTs), (2) establishing Ward-based PHC Outreach Teams (WBPHCOT), (3) establishing the Integrated School Health Services Programme, and (4) contracting general practitioners to work in PHC facilities. The first three elements are formal indicators in the 2010–2014 NSDA and have been updated for the reporting period (Table 4).

Reflecting on the 2013/14 performance, the 90% coverage of districts (46/52) by DCSTs (4.6) meets the 2014 target in principle. The challenge for the Department remains the recruitment of the full complement of seven specialists for each team, namely: Family Medicine specialist, Obstetrician and Gynaecologist, Paediatrician, Paediatric Nurse, Advanced Midwife and PHC Nurse. The initial focus of the teams is on enhancing maternal and child care and an evaluation of the impact of this PHC re-engineering component would be valuable.

The Ward-based PHC Outreach Team indicator (4.4) is showing modest progress. The 1 063 ward teams established in 2013 represent 57% of the 1 875 teams required to achieve the 2014 NSDA target of 30% coverage of the population.

The Integrated School Health Services (4.3) is the one component in the PHC re-engineering basket that reflects limited progress. Although the overall coverage of Quintile 1 and 2 schools is 20% in 2013, the coverage of learners of different grades differs, with

20% of Grade 1 pupils covered compared to only 12% of pupils in Grade 8. Reproductive health is an element of the school-based programme and this component successfully augmented the national HPV vaccine programme which resulted in 87% coverage of Grade 4 girls in all public schools. The strategic resource allocation across preventative strategies and grades will be an important consideration for making sustainable progress in this component.

From the 2013/14 budget report, it is noted that the consistently lower-than-expected PHC utilisation rate of 2.4 visits per annum is of concern due to the deviation from the NSDA target of 3.5 visits and the APP target of 2.8 visits. The data captured for this indicator are not complete and the availability and training of data capturers forms part of the required remedial action. The 2014 NDSA target seems ambitious in view of the internal DoH target.

Improving patient care and satisfaction (4.7–4.9)

The main achievement of note in this section of the NSDA 2010–2014 is the establishment of the Office of Health Standards Compliance in 2013, constituted through the signing of the National Health Amendment Act 12 of 2013 by the President. Subsequently, the OHSC Board was established in January 2014.

Improved human resources for health (4.10–4.13)

Obtaining data to monitor the intake of key human resources has not been straightforward. Data obtained from the Department of Higher Education did not distinguish the new students from all the undergraduates. However, since 2011, the NDoH has obtained information from universities on the numbers of new medical and pharmacy students, which are presented in Table 3. These data show a small increase, but not the number required to augment the levels human resources in line with the envisaged need. The number of nurses graduating from a four-year programme has been obtained from the South African Nursing Council. These indicate that 2 368 nurses were trained in 2009 which increased to 3 261 in 2013, somewhat short of the target increase of 5 000 nurses.

Strengthening financial management (4.14–4.15)

Performance related to unqualified audits and spending on infrastructure has remained unchanged. The National Department of Health has consistently achieved unqualified audits over the past three years but financial management at provincial level remains a challenge. Only two Provincial DoHs (North West and Western Cape) obtained unqualified audit opinions. In the Annual Report 2013–14, the Auditor-General of South Africa (AGSA) indicated that all nine provinces had financial improvement plans and submitted financial reports against a defined set of non-negotiable items on a monthly basis. These measures

at provincial level have not, however, resulted in achieving the requisite standards of the formal financial audits.

Building blocks of NHI (4.16–4.17)

Progress in the policy and legislation framework for the NHI was limited. Although draft documents such as the NHI White Paper and the NHI Fund discussion document were produced, these were not finalised during the reporting period. The pilot process of NHI in the 11 pilot districts is continuing and involves a range of initiatives. An example of this is the readiness assessment for TIER 3: SMARTER (the updated electronic ART register) which has been implemented in seven clinics, two community health centres and five hospitals in the NHI pilot districts. Six central hospitals have improved revenue collection by strengthening information systems in preparation for NHI implementation.

Strengthening Health Information Systems (4.18–4.19)

There has been some progress on the M&E framework during 2013 with comments received on the draft. Delays in the finalisation of the framework are a source of concern. It is expected that the framework will be finalised before the end of the NSDA reporting period. Specific activities related to the Health Information Systems in the Department have been undertaken, such as the implementation of the electronic ART Register (TIER.Net) and the implementation of the National Indicators Data Set (NIDS) for 2013–2015 in all the provinces.

Table 4: Health sector outputs, indicators, targets, values and data sources (Output 4)*

OUTPUT	INDICATOR	TARGET 2014	BASELINE 2009	2010	2011	2012	2013	SOURCE OF DATA
RE-ENGINEERING PHC SYSTEM	4.1 Primary health care utilisation rate	3.5 visits per person per annum	2.4 visits per person per annum (revised after data cleaning)	2.4 visits per person per annum	2.5 visits per person per annum	2.5 visits per person per annum	2.4 visits per person per annum	DHIS NDoH
	4.2 OPD clinic new case not referred rate	30%	55%	54%	53%	52%	47%	DHIS NDoH
	4.3 School health programme coverage	95% of all Quintile 1 schools & 95% of all Quintile 2 schools	No baseline (new programme)	No data	No data NDoH reports: Q1 and Q2 schools identified in Oct 2011	No data NDoH reports: Programme launched 2012 and data capture on DHIS has been initiated	20.2% in Q1 and Q2 31% Q1 & Q2	PHC re-engineering M&E NDoH / DBE / DSD
	4.4 PHC Outreach Team coverage	30% population covered at target level of 1 team per 7 660 persons or 1 619 households	No baseline (new programme)	No data	No data NDoH reports: 143 teams trained for pilot districts in Jan 2012	No data NDoH reports: 945 Ward-based Teams established	No data NDoH reports: 1 063 Ward-based Teams established	PHC re-engineering M&E NDoH Annual Report

OUTPUT	INDICATOR	TARGET 2014	BASELINE 2009	2010	2011	2012	2013	SOURCE OF DATA
					61 teams established in March 2012			
	4.5 CHWs	45 000 formally trained and placed to meet target of 1 per 270 households	65 000 various categories (2011 audit)		No data NDoH reports: 5 000 PHC agents trained by Nov 2011	No data NDoH reports 4 872 CHWs trained by March 2013	9 898 CHWs trained in Phase I Foundation	QRS / Annual report NDoH / DSD
	4.6 District Clinical Specialist Team coverage	80% of total districts with gynaecologist in DCST 100% of NHI pilot districts	No baseline	No data	No data NDoH reports: Job description undertaken Aug 2011; Advertisements placed in Oct and Nov 2011; 3 000 applications received (450 doctors); Candidates shortlisted and assigned to districts including pilot districts	21 out of 52 districts have obstetrician (43%) 34 District teams with at least 3 members 4 out 11 NHI pilot Districts have obstetrician (44%)	46 out of 52 districts with at least 3 or more members	PHC re-engineering M&E NDoH

OUTPUT	INDICATOR	TARGET 2014	BASELINE 2009	2010	2011	2012	2013	SOURCE OF DATA
Improving patient care and satisfaction	4.7 Percentage of users of public health services highly satisfied with the service received	70%	54% (Public)	56% (Public)	62% (Public)	57% (Public)	61% (Public)	General Household Survey Stats SA
	4.8 Office for Health Standards Compliance established	Established by 2012	No baseline	No data	OHSC Bill tabled in Parliament in Dec 2011 Trained and appointed 20 Inspectors in Dec 2011 by NDoH	National Health Act Amendment Bill passed without opposition by NCOP in Dec 2012	Act signed into law July 2013 Office established and Board established Jan 2014	NDoH
	4.9 Certification of health facilities (public and private)	20%	None	No data	No certification NDoH reports: 3 780 facility audits have been completed Four facility improvement teams were appointed to four provinces	No certification 235 mock inspections completed by Dec 2012 to establish certification system	582 mock inspections completed	NDoH

OUTPUT	INDICATOR	TARGET 2014	BASELINE 2009	2010	2011	2012	2013	SOURCE OF DATA
					in Jan 2012			
Improved human resources for health	4.10 Hospital managers meeting competency criteria	100%	No baseline	No data	No data NDoH report: Regulations in terms of the National Health Act of 2003 published on 12 August 2011 in Gazette No. 34521 aimed at providing clear designations to managers and CEOs of different categories of hospitals and the required skills and competencies for managing hospitals Posts for hospital CEOs advertised in Feb 2012	No data NDoH report: Established Health Academy by October 2012 103 CEO posts filled by Dec 2012 88 CEOs attended 1-week orientation programme offered by Health Academy	No data NDoH report: 260 CEOs attended training	Competency Assessment Survey NDoH

OUTPUT	INDICATOR	TARGET 2014	BASELINE 2009	2010	2011	2012	2013	SOURCE OF DATA
	4.11 Intake of medical students	Additional 1 053 per annum	No data	4 427 undergrad students enrolled 641 undergrad graduates	5,228 undergrad students enrolled 729 undergrad graduates 1 582 new 80 RSA-Cuba programme	5,425 undergrad students enrolled 699 undergrad graduates 1 767 new 961 RSA-Cuba programme	1 707 new 882 RSA-Cuba program	HEMIS/DHE NDoH
	4.12 Intake of pharmacy students	Double intake	No data	2 490 undergrad students enrolled 471 undergrad graduates	2 828 undergrad students enrolled 509 undergrad graduates	3 131 undergrad students enrolled 561 undergrad graduates		HEMIS/DHE
	4.13 Intake of nursing students (professional nurses)	Additional 5 000 per year	No data	6 502 undergrad students	676 new 6 529 undergrad students	811 new 7 497 undergrad students	835 new	NDoH DHE/HEMIS

OUTPUT	INDICATOR	TARGET 2014	BASELINE 2009	2010	2011	2012	2013	SOURCE OF DATA
				enrolled	enrolled	enrolled		
			2 638 4-year programme graduates	2 960 4-year programme graduates	2 966 4-year programme graduates	3 225 4-year programme graduates	3 261 4-year programme graduates	South African Nursing Council
Strengthening Financial Management	4.14 Number of Health Departments receiving unqualified audit reports from the Auditor-General	9/9 Provincial DoHs and 1 National DoH	3/10 (2009/10) (1 National and 2 Provincial DoHs)	2/10 (2010/11) (2 Provincial DoHs)	2/10 (2011/12) (1 National and 1 Provincial DoH)	3/10 (2012/13) (1 National and 2 Provincial DoH)	3/10 (2013/14) (1 National and 2 Provincial DoH)	Auditor-General's Report on the Annual Financial Statements of government departments Auditor General
	4.15 Under-spending on infrastructure	5%	16.2% R1.342b	27.7% R 2.518b	12.7% R1.191b	10.3% R0.967b	12.7% R1.155b	National Treasury BAS system & conditional grant reports, Auditor-General's Report on the Annual Financial Statements of government departments

OUTPUT	INDICATOR	TARGET 2014	BASELINE 2009	2010	2011	2012	2013	SOURCE OF DATA
Building blocks of NHI within the DoH	4.16 Policy and legislation framework	Green Oaper - 2011 White Paper Act and Regulations	No baseline	No data	Green Paper on NHI released for public consultation on 12 Aug 2011	Draft White Paper Draft Bill Draft Implementation Plan	Draft White Paper on NHI revised and tabled to Social Cluster in Nov 2013. NHI Fund draft document prepared and 119 GPs contracted. Medical Devices Regulation published for comment.	NDoH
	4.17 NHI pilot districts	10 pilot districts	No baseline	No data	10 pilot districts announced March 2012 Additional area in KZN identified by province	11 pilot districts initiated by Dec 2012	11 pilot districts	NDoH

OUTPUT	INDICATOR	TARGET 2014	BASELINE 2009	2010	2011	2012	2013	SOURCE OF DATA
Strengthening Health Information Systems	4.18 Integrated M&E Framework for Health	Integrated framework for SA by 2012	No baseline	No data	An M&E plan for the NSDA 2010–2014 was produced, with technical support from an external service provider. The M&E plan was accepted by the HDACC of the NDoH as a working document. The National Health Information Repository and Data Warehouse (NHIRD) was established in the NDoH and provincial DoHs	Different components of the M&E system are being implemented and maintained, including M&E Plan, DHIS Policy, 3-Tier, ART, M&E system & NHIRD	M&E plan revised and final expected in 14/15. 2 754 health facilities implementing e-ART register (TIER.Net), of which 1 419 have real-time data allowing ART cohort reporting NIDS implemented by all provinces	NDoH
	4.19 5-year HMIS strategy for SA	5-year strategic plan by 2013	No baseline	No data	No data	Draft HMIS for 2014–19	e-Health Strategy and Normative Framework	NDoH

* Updated information can be found in Annexure 3.

The MTSF 2014–2019 has retained all the six focus areas for strengthening the health effectiveness of the health system entailed in the NSDA 2014–2019. However, it also carries two additional areas for health systems strengthening, namely: (a) Reduced health care costs and (b) Improved health facility planning and infra-structure delivery. This is reflected in Table 5.

Table 5: Comparison of the health systems effectiveness priorities of the NSDA 2010–2014 and the MTSF 2014–2019

NSDA 2010–2014	MTSF 2014-2019
• Re-engineering primary health care • Improved patient care and satisfaction • Improved human resources for health • Strengthening financial management • Building blocks of NHI within the DoH • Strengthening health information systems	• Universal Health coverage progressively achieved through implementation of National Health Insurance • Improved quality of health care • Implement the re-engineering of primary health care • Reduced healthcare costs • Improved human resources for health • Improved health management and leadership (this includes improving financial management) • Improved health facility planning and infra-structure delivery • Efficient health management information system developed and implemented for improved decision-making

As Table 5 illustrates, the MTSF 2014–2019 has maintained consistency with the NSDA in terms of key interventions to strengthen health systems effectiveness. It is imperative that focus on this priority area is vigilantly maintained, given the fact that relatively limited progress was made by the health sector towards most of the targets set in the NSDA 2010–2014, compared to the targets set for health outcomes (life expectancy infant mortality; child mortality; combating HIV/AIDS and TB). The effectiveness of the health system requires continuous strengthening even during the 2014–2019 planning cycle.

Whereas the NSDA 2010–2014 monitored only 19 indicators, there is a total of 69 indicators for tracking health systems effectiveness strengthening in the MTSF.

5. Health systems performance

Aside from the high level indicators identified to monitor performance against the NSDA, HDACC idenfitied the need to consider a comprehensive set of indicators that would provide an overview of the performance of the health system. A sub-committee has considered several WHO frameworks and identified indicators that would assist with the assessment of programmes and system inputs. This process has not been completed, but the set of indicators to to monitor trends in health care financing have been monitored since 2009/10.

Health financing

HDACC has identified three key domains of health financing to be monitored. These relate to raising sufficient funds for health, improving financial risk protection, and improving efficiency of resource utilisation and financial management. Updates of the selected indicators are provided in Table 5. Current data sources for information on health financing are mainly the National and Provincial Treasury publications on the budget. It would be useful were South Africa to re-start the National Health Accounts project, which combines expenditure data from all sources and through all types of financial agents, as recommended by the WHO. This would be a valuable additional source of information.

Sustainable health financing (5.1–5.4)

South Africa spent approximately 9% of Gross domestic product (GDP) on health in 2013/14, slightly higher than the proportion of 8.6% in 2009/10. Of this total, 4.4% of GDP (R154 billion) was accounted for in the public sector, with 4.5% of GDP channelled through private financing streams (R157 billion) and the remainder (0.1%) through donors. Government expenditure on health as a proportion of its total expenditure increased from 13.1% in 2009/10 to 15.5% in 2013/14.

Financial risk protection, equity (5.5–5.7)

During this period, there has been little change in the proportion of people covered by medical aid (at 16.6% in 2013/14) or the proportion of out-of-pocket expenditure (7.1% in 2013/14).

Financial management and efficiency (5.8–5.9)

While the proportion of government health expenditure on administration has decreased slightly from 7.2% to 5.4%, the proportion of government health expenditure on primary

health care (excluding spending on HIV/AIDS) has declined from a high of 20.6% in 2010/11 to 18.5% in 2013/14.

Table 6: Health sector inputs, indicators, baseline and data sources (health financing)

INPUT	INDICATOR	2009/ 10	2010/ 11	2011/ 12	2012/ 13	2013/ 14	SOURCE OF DATA FOR NUMERATOR	SOURCE OF DATA FOR DENOMINATOR	AGENCY	FREQUENCY
Sustainable financing for health	5.1 Percentage of GDP spent on health	8.6%	8.6%	8.9%	9.0%	9.0%	The sum of all health expenditures (all sources of funds – public, private, donor and non-government including household out-of-pocket payments)	Gross Domestic Product (total national output, income and expenditure in the economy)	National Treasury	Annual
	5.2 Public sector spending on health as % of GDP	4.1%	4.1%	4.3%	4.4%	4.4%	The sum of all public health expenditures	Gross Domestic Product (total national output, income and expenditure in the economy)	National Treasury	Annual
	5.3 Government health expenditure as a proportion of total government expenditure	13.1%	13.4%	13.9%	14.2%	15.5%	The sum of all government health expenditure (national and provincial)	The sum of all government expenditure	National Treasury	Annual

	5.4 Public health expenditure per capita (uninsured)	R2 385	R2 610	R2 954	R3 209	R3 414	The sum of all public health expenditures (consolidated budget)	Uninsured population	National Treasury Stats SA, Council for Medical Schemes	Annual
Financial risk protection, equity	5.5 Medical scheme coverage	16.1%	16.3%	16.5%	16.6%	16.6%	Numerator: number of medical scheme beneficiaries (principle members and dependents)	Denominator: population	Council for Medical Schemes	Annual
	5.6 Out-of-pocket spending as % of total health expenditure[3]	7.7%	7.5%	7.3%	7.2%	7.1%	Numerator: Out-of-pocket spend (National Treasury Budget Review 2012)	Denominator: Total of public, private and donor/NGO (National Treasury Budget Review 2012)	National Treasury	Annual
	5.7 Differentials in district per capita spending on health	Tbd	Tbd	Tbd	Tbd	Tbd	Indicators being considered			

[3]The WHO notes that this is often the largest source of error in estimates of national health spending, due to challenges in defining what is included in the numerator (which usually includes: public sector user charges; public sector informal payments; outpatient services from physicians and dentists; private hospital services; pharmaceutical products; preventive health services; other ambulatory care services and residual items), and measurement error in the context of expenditure data derived from surveys.

Financial management and efficiency	5.8	Administrative expenditure as proportion of government health expenditure	7.2%	5.8%	6.0%	5.8%	5.4%	The sum of all national health expenditure excluding transfers to entities and provinces and provincial expenditure on Programme 1 (administration) and 2.1 (district management)	The sum of national and provincial health expenditure	National Treasury	Annual
	5.9	Primary health care as proportion of government health expenditure[4]	19.9%	20.6%	20.3%	19.4%	18.5%	The sum of all provincial & local government expenditure on primary health care	The sum of all provincial and local government health expenditure	National Treasury	Annual

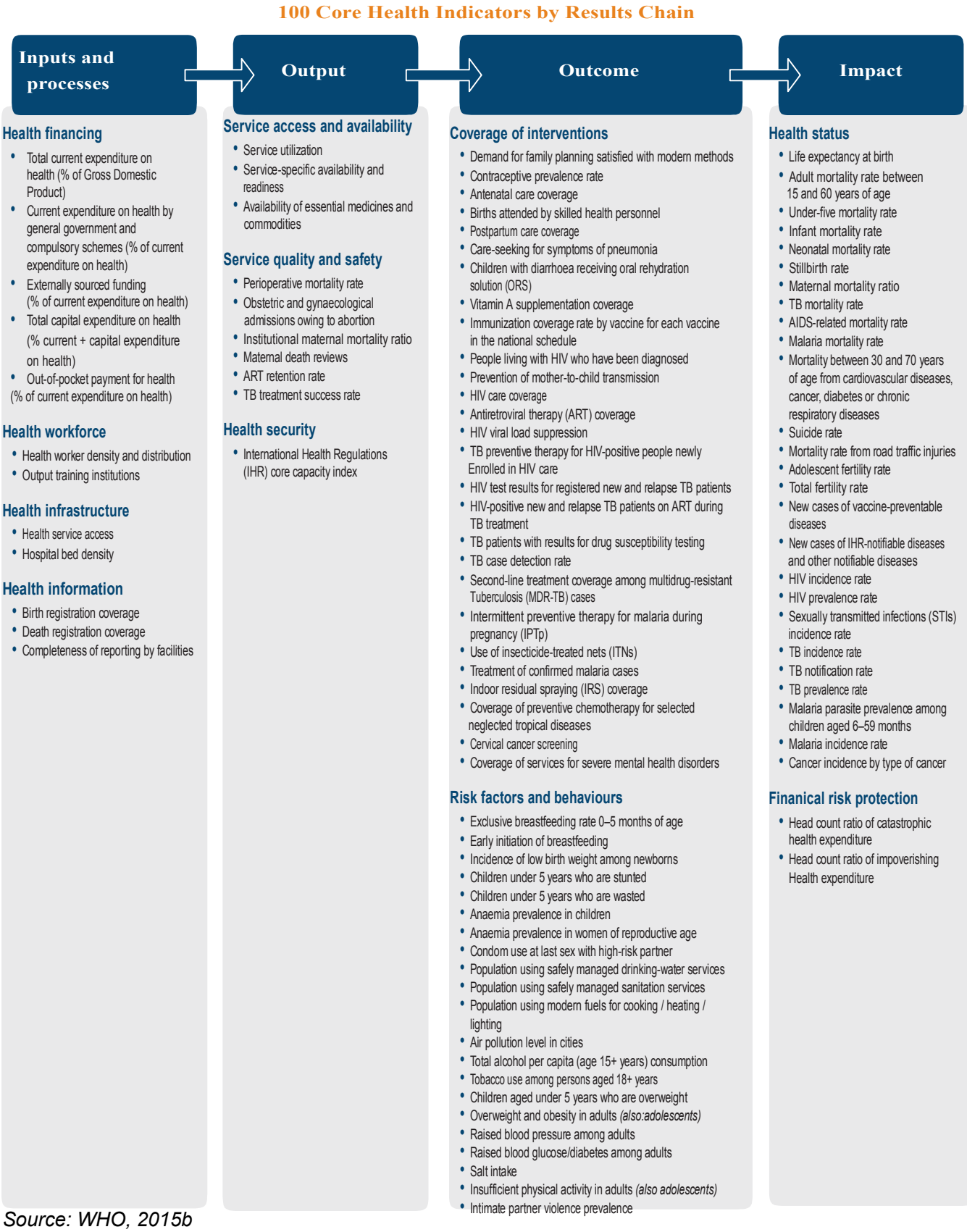
[4]Note that this excludes HIV spending.

Future HDACC activities

The WHO has held technical consultations about the reporting burden to global health agencies and has developed a core set of indicators known as the Global Reference List of 100 Core Health Indicators for results monitoring (WHO, 2015b). The indicators span the Millennium Development Goals (MDGs) agenda, as well as new and emerging priorities such as non-communicable diseases, universal health coverage and other issues in the post-2015 development agenda. The list, shown in Table 7, is intended as a guide for countries, providing standard indicators and definitions.

HDACC has been considering the indicators needed for monitoring health systems performance and the process is yet to be finalised. It should be pointed out that these indicators go beyond the programme monitoring indicators identified for DPME monitoring, and the aim is to single out indicators that will act as an early warning system. There is overlap between the indicators identified by HDACC, either as high-level indicators or for monitoring health system performance, and the WHO's proposed core indicators. However, there are some indicators for which South Africa does not yet have systems in place for national monitoring, e.g. peri-operative mortality rates. The review of health systems performance indicators should be completed in the context of the emerging indicators proposed for monitoring the SDGs.

Table 7: WHO 100 Core Indicators by Results Chain



Source: WHO, 2015b

6. Strengthening health information systems

The information system development outcome in the MTSF 2014–2019, encapsulated in the NDoH Strategic and Annual Performance Plan, is stated as "*efficient Health Management Information System developed and implemented for improved decision making*". The District Health Management Information System Policy (DHMIS) envisions a comprehensive integrated DHMIS, comprising population-based information, health services-based information, health resources records, vital registration data and transversal government data.

The previous HDACC report noted that an eHealth strategy has been adopted to ensure that South Africa can leverage eHealth to strengthen the transformation of health care. The strategy provides a roadmap towards an integrated and well-functioning national patient-based information system. The report also noted that the NDoH is developing a national Health and Management Information System (HMIS) Strategy and that the data platforms need to be strengthened. In this report, HDACC notes the developments that are under way.

Monitoring and evaluation (M&E)

The National Health Act (61 of 2003) empowers the Director-General of Health to identify national health goals and priorities and to monitor the progress of their implementation. The National Health Act also requires evaluation of health services. Similarly, the Act also empowers the Heads of Provincial Departments to monitor health services and evaluate the rendering of health services.

In 2014/15, the Department ensured that the Annual Performance Plan was implemented, monitored and reported on a quarterly basis to National Treasury, the Auditor-General and the Department of Planning, Monitoring and Evaluation in the Presidency. The NDoH Annual Report 2014/15 was tabled on time as required by the legislation. The National Indicator Data Set (NIDS) was reviewed in 2012/13, with engagement of programme managers and provinces, and implemented from April 2013.

The Framework for the Development and quarterly monitoring of the Annual Performance Plans (APP) and the Operational Plans of the National Department of Health were also revised to align with the Department of Performance Monitoring and Evaluation's (DPME) new Reporting Guidelines released in 2014/15. Based on the Management Performance Assessment Tool (MPAT) administered by the DPME, the NDoH improved performance on

Monitoring and Evaluation from a rating of two in 2013, indicating partial compliance, to a rating of four in 2014, indicating full compliance plus working smartly.

Furthermore, an Integrated Monitoring and Evaluation Strategy was drafted in consultation with relevant stakeholders. It emphasises the elements of M&E design during planning, the link between planning, monitoring and evaluation, the allocation of resources for evaluations, data quality improvement, enhanced M&E capacity and the use of evidence for planning and decision-making, and continuous performance improvement. In order to build on the gains made in 2014/15, the Department will facilitate the approval of the M&E Strategy by the National Health Council, and will also establish a comprehensive indicator list that incorporates national and international obligations, including the new Sustainable Development Goals' indicators.

Civil Registration and Vital Statistics (CRVS)

During 2014, the Departments of Home Affairs (DHA), Statistics South Africa (Stats SA), Justice and Correctional Services (DoJ&CS), Health (DoH), Social Development (DSD) and Basic Education (DBE) constituted the lead team for conducting and co-ordinating the CRVS assessment in South Africa. The aim of the assessment was to identify strengths and weaknesses in the current systems, drawing lessons from what has worked over time, and to provide evidence of required interventions for strengthening the system. An inter-departmental technical working group has been established to participate in the assessment, strategic planning and implementation of the strategic plan. Multi-methods are being used in the assessment including desk reviews, in-depth interviews, focus group discussions, client-exit interviews and observations. Specific task teams have been set up to review the assessment tool and design the questionnaires, and to conduct stakeholder workshops, training, data collection and data processing, making use of the assessment tools prepared by the United Nations Economic Commission for Africa and in line with the United Nations principles and recommendations for a Vital Statistics System. The focus areas of the assessment are:

- Policy and Legal Framework
- Operations and practices in live births, deaths, stillbirths, adoptions, marriages and divorces
- Operations and practices in vital statistics
- Recording and processing of cause-of-death records.

South Africa prepared a country report for the Third Conference of African Ministers Responsible for Civil Registration and Vital Statistics held in Côte d'Ivoire from 9 to 13

January 2015, reporting on the initial phase of the assessment. The full analysis of the information that has been collected in the assessment is currently under way.

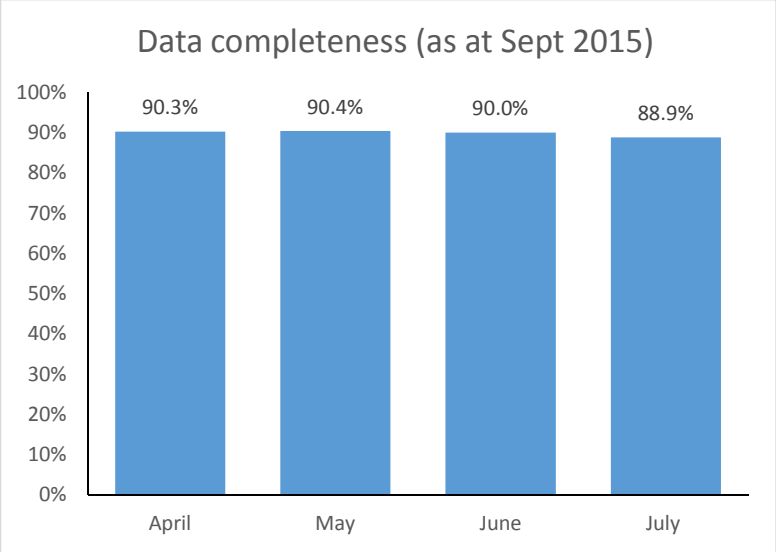
In the meanwhile, Stats SA has improved on the time-lag in reporting cause-of-death statistics. While the report for 2011 data was released 26 months after the end of the year (Stats SA 2013), this was reduced to 20 months for 2012 data (Stats SA, 2014a) and 11 months for 2013 data (Stats SA, 2014b). A consequence of the faster reporting cycle is that a larger proportion of late registrations are not processed in time and hence are omitted from the official statistical report for that year.

In February 2014, an amendment to the regulation in the Birth and Death Registration Act was gazetted, making the last page of the death notification form self-sealing and stipulating that it may only be opened by an official from Stats SA. While fully recognising the need to ensure confidentiality of cause-of-death information, and appreciating efforts to strengthen civil registration, this has inadvertently restricted access by the Department of Health to identifiable cause-of-death information. This is of concern because it limits the Health Department's scope for public health interventions and surveillance if such information cannot be accessed quickly and rapid responses designed. Inter-departmental discussions to resolve this issue are underway.

District Health Information System

The District Health Information System (DHIS) is a comprehensive information system that forms the backbone of the routine collection of statistics in the public sector. All facilities report on a monthly basis providing aggregate data elements for the standard set of indicators as defined in the National Indicator Data Set (NIDS). The data are consolidated at district and provincial information offices and submitted to the national office. The implementation of the DHIS is governed by the DHMIS policy and associated Standard Operating Procedures (SOPs). Among low- and middle-income countries, South Africa is considered an international 'best practice' examplare of a well-managed national routine information system for aggregate data, and can boast having a data completeness rate of around 88% within six weeks after the end of the reporting period (see Figure 5). The system is well established in the public sector, but coverage of the private sector and non-governmental sector is still very low.

Figure 5: DHIS data completeness by month as at September 2015



The DHIS contains data dating back to 1997, and currently documents over 120 million PHC encounters at 3 641 PHC facilities annually. Timeliness of reporting has improved considerably. In 2003, the average time-lapse between the initial data capture for each specific reporting period was around 27 days. By 2015, the average time-lapse had been reduced to about nine days. This decrease is the result of improved training of information officers at sub-district level, increased access to computers and other specific interventions to improve data timeliness.

The DHIS uses mechanisms to manage data quality, such as min-max values, data validation rules (which ensure internal consistency of the data), and functionality to identify outliers and errant values. In addition, over the last two years, quarterly data quality reviews have been institutionalised at district, provincial and national levels to review data and ensure that quality data are used for onward submission to Treasury and international organisations (such as the WHO). Each year, prior to the production of the Departmental Annual Report, data are 'locked' in the system and cannot be changed. This measure is to ensure consistency in reporting of indicators.

The District Health Barometer, using mostly selected DHIS data, provides an annual overview of the delivery of primary health care in the public health sector (Massyn et al., 2015). The authors note the less-than-optimal quality of data and provide illustrative examples in Chapter 14 of the 2013/14 District Health Barometer (2014). They furthermore caution that the current performance of districts and provinces as reflected in the Barometer might not necessarily be a true representation of actual service delivery on the ground. The authors recommend that data quality be improved and urge that all facilities implement and adhere to the SOP for the correct completion of the data collection tools.

They highlight the need for all facility staff to be trained on data element definitions and that the data quality assessment functions be performed according to the SOP. They suggest that in addition, some manual checking mechanisms be implemented at different levels of the system and highlight the need for the data collection tools to be standardised, limited and user-friendly.

Population estimates are needed by the DHIS at the level of the health district and sub-district for the calculation of per capita indicators that are useful at the level at which health is managed on a day-to-day basis. HDACC notes that it is extremely difficult to estimate the population at the district level, particularly for districts with small populations. There are several reasons for this but chief among these is the uncertainty about the reliability of the district population estimates from the Census. The estimates of the size and demographic profile of these populations in the Census is only approximate since the undercount is high (and not uniform) and thus the estimates have be adjusted for undercount as measured by a (post-enumeration) survey, which is not only too small to make accurate adjustments at the level of small district populations, but relies on the undercount in the survey being independent of that in the Census (which is unlikely to be true). Detailed information about population characteristics at a sub-district level are only collected from time to time (full census every 10 years and a large Community Survey in between). Deriving population estimates therefore requires estimates of fertility, mortality and migration patterns in each area (which are generally not known). Furthermore, the circular migration patterns frequently found in parts of South Africa add to this challenge. The smaller the district population, the more it can change due to in- or out- movement of people and this movement is very difficult to project. Errors in the population estimates have a severe impact on health indicators such as immunisation coverage rates. A further challenge is that district-level estimates are updated generally less frequent than national or provincial estimates. Thus the routine data systems might be based on slightly different population estimates from the latest available data at national or province level.

HDACC has identified the need for further evaluation of the 2011 Census results against other data sources to obtain the best estimates of the demographic trends. These findings should be incorporated into the population projection and small-area estimates. All data sources such as the National Population Register, school enrolment and the DHIS should be used for the evaluation of the Census result. Such a review is critical not only for the health sector but for all sectors. A workshop of demographic experts to consider this issue would be helpful.

Disease surveillance and disease registers

HDACC plans to do a systematic assessment of disease surveillance and disease registers, as in the compilation of high-level indicators, the need to strengthen disease surveillance and disease registers has been noted.

Patient-level information systems are currently available for the management of specific disease programmes, in particular the TB register and Tier.Net for HIV patients. Due to the demand to improve management of HIV/AIDS and to track progress in cohorts of patients over time, there is an increasing global trend towards introduction of patient-based information systems.[5] The use of paper-based systems for tracking both HIV and tuberculosis patients over time is extremely cumbersome and inefficient, especially where patients are mobile and move between facilities for care. Electronic systems potentially provide a more efficient mechanism to manage chronic patients over the continuum of care, and to reduce waiting times in facilities, but are hindered by lack of connectivity and access to computers, low levels of computer literacy, and fragmented systems.

South Africa has a Disease Notification System regulated through the National Health Act, making 18 conditions notifiable. The notification system has not functioned well and as from April 2015 will be managed by the National Institute for Infectious Diseases (NICD) which will provide an opportunity for consolidation of the infectious disease surveillance with the laboratory-based surveillance being conducted by the NICD. It is important that the compilation of local statistics regarding the incidence of notifiable conditions be resumed after a long absence of reporting.

In 2011, Regulation 380 of the National Health Act (61 of 2003) made the reporting of all confirmed cancer diagnoses to the National Cancer Registry obligatory. Once data reporting mechanisms have been developed, this will enable the previously pathology-based register to provide more comprehensive information. A challenge faced in terms of the register is being able to obtain information from death notifications for people who have died from cancer. Currently, there is no mechanism for the registry to access such information.

A Bill to establish the National Public Health Institutes of South Africa (NAPHISA) was passed by the National Assembly in November 2015 to set up an entity that will conduct disease and injury surveillance and provide specialised public health services, public health interventions, training and research directed towards the major health challenges affecting South Africans (RSA, 2015). The establishment of a National Surveillance Co-ordinating

[5] Common Roadmap Steering Committee; Roadmap for Health Measurement and Accountability; accessed at http://ma4health.hsaccess.org/partners

Forum is an important process to strengthen the links between different agencies involved in disease surveillance in the country.

The Ebola outbreak highlighted the importance of countries complying with the International Health Regulations.These regulations outline core competencies to protect the world's population from threats like infectious diseases, and chemical and radiological events. The agreement is called the International Health Regulations 2005, or IHR (WHO, 2008). Through the IHR, the WHO keeps countries informed about public health risks, and works with partners to help countries build capacity to detect, report and respond to public health events. A high-level partners' meeting was held in Cape Town in July 2015 to review the requirements and actions to build health security beyond Ebola. Compliance with the IHR should be assessed in South Africa and core competencies should be strengthened as needed.

Patient information systems

During the 2014/15 financial year, the Department gazetted the National Health Normative Standards Framework for interoperability in eHealth in South Africa (RSA, 2014), and subsequently commissioned the Council for Scientific and Industrial Research (CSIR) to assess the level of Primary Health Care Patient Information Systems (PHC-PIS) implemented in South Africa against the published National Health Normative Standards Framework. This exercise included an analysis of the costs entailed in implementing each of those systems. The Department intends to conduct a similar assessment for all Hospital Information Systems in the next financial year. It is expected that findings emanating from the assessments will guide provinces in developing appropriate systems.

While these processes are unfolding, the NDoH has also embarked on an aggressive programme to provide computers and other hardware (printers, bar-code scanners and mobile devices), connectivity (including satellite connectivity where necessary), and electronic patient management systems to 700 facilities in 10 NHI districts around the country.

The NDoH has implemented an integrated programme in the 10 National Health Insurance (NHI) pilot districts (Wolmerans et al., 2015). A reference implementation methodology has been applied based on the eHealth architecture building blocks. The Department has integrated eight information system initiatives targeted at primary health care facilities into this reference implementation project. A key component of the reference implementation is to develop and implement a Health Information Exchange in a phased manner. Another component aims to reduce data collection tools in primary health care facilities from around 65 registers to only six 'integrated' data registers. Once facilities are computerised and

connected to the internet, staff are expected to be able to register patients electronically at facility level, utilise electronic patient management systems such as the Tier.Net and ETR.Net, access laboratory results electronically, and report data into the centralised, web-based DHIS by the end of March 2016.

A further expansion across another 1 400 facilities is anticipated during the next financial year, with the balance of all PHC facilities to be computerised in the 2018/19 FY, thus helping the country achieve the strategic goal of preparing for the introduction of electronic patient information systems by 2020.

Population-based surveys

Strengthening health information systems requires integration and strengthening of survey data and methods of collating data. Population-based health surveys are essential to track the health needs of the population, monitor the performance of health services and understand the determinants of health. They also feed into population estimates and are important for population projections. Population-based surveys are needed to measure key health outcomes such as maternal and child mortality, the coverage of key health programmes, and indicators related to the major causes of the burden of disease so as to inform policy decisions. Importantly, they obtain information that is representative of the whole population, and not only of those who attend health services.

In the development and monitoring of indicators through the work of HDACC, a number of national surveys are used as valuable sources of information to inform the indicators and computation of some of the indicators. These surveys include the South African HIV/AIDS Behavioural Risks, Sero-Status and Mass Media Impact Survey (SABSSM) and the South African National Health and Nutrition Examination Survey (SANHANES). HDACC has noted the lack of a Demographic and Health Survey since 2003, a key source of information about maternal and child health programmes as well as family planning and adult health. Advanced plans for implementation in 2016 are under way. In addition, a TB burden survey is planned as it is essential to obtain more reliable information about the prevalence of TB.

Population-based surveys have their own limitations. Intervention programmes such as those dealing with HIV are mostly implemented at district level, while population-based surveys are generally only representative at provincial or national level. This limits population-based surveys in their ability to inform programmes at local level. The design of these population-based surveys requires improvements and strengthening to enable ease of understanding of dynamics at local level, such as district level. Adaptation of these

surveys to meet this demand of information at local level will have serious financial implications.

The response rate in the population-based household surveys, especially for detailed biomedical indicators, should be addressed. In the SABSSM 2012 survey, for example, the participation rates were good; however, the participation among Indians and Whites remained a major issue. The overall response rate for HIV testing in this survey was 67.5% which matches the 67.0% achieved in the 2008 survey. However, when data on the response rate were disaggregated by race, it was found that black Africans (73.3%) and Coloureds (69.6%) were more likely to agree to be tested and that Indians (54.0%) and Whites (43.0%) were less likely to agree to be tested in the survey. This is despite a communication mobilisation campaign conducted half-way through the survey to reach these two groups. The lack of participation in HIV surveys is related to the perception that HIV is not a problem in their communities (Shisana et al., 2009).

Population-based health surveys are significant undertakings and require strategic planning, adequate resources and quality implementation. The frequency and content of the surveys conducted need careful consideration. A youth risk behaviour survey is needed to follow up on earlier surveys conducted among learners to track health behaviours at an early age, and a gender-based violence survey is important to assess the scope of the problem. As a matter of urgency, the country needs a strategic plan for a sustainable programme of health surveys.

Aligning private sector information systems

There is generally little exchange of information between the public and private health sectors. The private sector has recently started to report maternal mortality and the number of births to the Maternal and Child Health Programme of the National Department of Health. However, consideration should be given to other areas of co-operation and data-sharing, particularly in the light of the NHI. The Hospital Association of South Africa (HASA) and the NDoH have had initial discussions to begin to identify the technical aspects that would be involved in aligning information systems so that the private sector can be incorporated into a national health information system.

International and national health statistics

It is important that HDACC be used to give a proactive review of both national and international health statistics. For example, the UN agencies produce annual estimates of vaccine coverage for all countries, as well as maternal and child mortality estimates. They generally send information about the estimates to the NDoH for comment. The expertise of

HDACC could assist the NDoH in reviewing the estimates. The process will help to ensure the application of best practice within the national context as well as alignment of indicators and estimates. With the adoption of the SDGs and the variation in estimates of some key indicators based on different data sources, it is important that HDACC assist the NDoH to understand the differences and contribute to the country process of review. While this has been achieved to some extent, there is considerable need and urgency to strengthen these activities and make them more efficient.

7. Conclusions and reflection

The HDACC committee has established a network of local institutions involved in the production and use of health data. It has advised government on high-level indicators, baselines and targets for the health outcomes of the NSDA. It has defined the relevant domains for measuring the indicators and has grappled with the data systems required to monitor these.

This report allows for reflection on the progress made on the NSDA targets over a four-year period comparing the 2013 data with the baseline data from 2009. In summary, the data shows a mixed performance.

Compared to the baselines that were set from 2009 data, there has been very good progress on ***Outputs 1 and 2 - Extending life expectancy and reducing maternal and child mortality***. The targets set for the five-year period have all been exceeded. A major contributor to this achievement has been the extensive roll-out of ART and the implementation of the PMTCT programme, although other factors may also have contributed to this. The MDG targets for maternal and child mortality have not yet been reached and lack of baseline data to monitor the nutritional status of children has made assessment impossible in this reporting period.

In terms of ***Output 3: Combating HIV and AIDS and tuberculosis,*** some of the targets have been met while others have not. Of major concern is the lack of an indication of a reduction in the incidence of HIV over this period. While achievements have been made in the provision of treatment, unless the spread of the disease can be halted, the country will be faced with an ever-growing challenge in health services. In addition, while there appears to have been some progress in the TB control programme, the issue of TB drug resistance poses a key threat to TB control.

The performance on ***Output 4: Strengthening health systems effectiveness*** has been mixed, with some evidence of progress but few targets being met. It is not clear whether the targets were unrealistic, whether there were insufficient resources for implementation or whether the mechanisms for health systems strengthening have thus far been inadequate to respond to the complexities of the health system.

Progress has been made in identifying the indicators required to monitor the performance of the health system but the task has yet to be completed. This should be done with the future-oriented SDGs in mind. Increasing use of accreditation of data quality standards will be required going forward in order to ensure good country statistics. Setting of targets has been done for the high-level indicators. The balance between aspirational and incremental

targets has been challenging and it would be ideal to use stronger methodologies, such as modelling, for setting targets to ensure consistency between targets.

The success of HDACC is that the reports have been well accepted and have provided a basis for critical evaluation. Links with international institutions have been developed to ensure compliance with best practice and alignment of indicators. The committee is renowned for robust and critical debates on the selection and acceptance of estimates of key health indicators. This has resulted in progress in and awareness of best practices to be used in gathering and interpreting data. The NDoH has increasingly requested advice and guidance on the integration and best use of national data for inclusion in the measuring of the health status of the nation as well as targets.

HDACC has found it challenging to obtain the data to monitor progress on the selected indicators, and has continually been 'behind the curve' in its reporting. Better co-ordination with the data producers would be helpful as would resources to undertake specific investigations to allow the committee to fulfil its advisory role. Engagement with the MDGs/SDGs country review process should be enhanced, as health data make a critical contribution in this endeavour.

Although self-reflection has been an integral part of the process HDACC has followed, an external review of HDACC's growth and progress would appear to be timely. Such a review will assist in strengthening the niche contribution to be made by HDACC and the contribution that it will make to strengthening the countries health data systems.

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Annexure 1: Members of the Health Data Advisory and Co-ordination Committee

Member	Organisation	e-mail
Prof Khangelani Zuma (Chairperson)	Human Sciences Research Council	kzuma@hsrc.ac.za
Dr Debbie Bradshaw (Deputy Chairperson)	South African Medical Research Council	debbie.bradshaw@mrc.ac.za
Dr Mark Blecher	National Treasury	mark.blecher@treasury.gov.za
Dr Hermi Boraine	Presidency	hermi@po-dpme.gov.za
Prof Rob Dorrington	University of Cape Town	rob.dorrington@uct.ac.za
Ms Candy Day	Health Systems Trust	candy.day@hst.org.za
Dr Mamaqhawe Hoohlo	Council for Medical Schemes	m.hoohlo@medicalschemes.com
Prof Kathleen Kahn	University of Witwatersrand	kathleen.kahn@wits.ac.za
Prof Demetre Labadarios	Human Sciences Research Council	dlabadarios@hsrc.ac.za
Dr Carl Lombard	South African Medical Research Council	carl.lombard@mrc.ac.za
Ms Bikiwe Lupindo	Presidency	bikiw@po-dpme.gov.za
Dr Ramos Mabudu	Financial and Fiscal Commission	ramosm@ffc.co.za
Mr Mohlapametse Maditse	Presidency	mohlapametse@po-dpme.gov.za
Mr Thulani Masilela	Presidency	thulani@po-dpme.gov.za
Ms Kefiloe Masiteng	Statistics South Africa	kefiloem@statssa.gov.za
Mr Norman Ramashia	Department of Home Affairs	norman.ramashia@dha.gov.za
Dr Vincent Shaw	Health Information Systems Programme	vshaw@hisp.org
Ms Sharon Slabbert	Hospital Association of South Africa	sharon.slabbert@hasanet.co.za

Mr Chiloane Molaba	Presidency	chiloane@po-dpme.gov.za
Dr Rajesh Patel	Board of Healthcare Funders	rajeshp@bhfglobal.com
Mr Matthew Prior	Life Healthcare	matthew.prior@lifehealthcare.co.za
Prof Helen Rees	University of Witwatersrand	hrees@whri.co.za
Dr Maletela Tuoane-Nkhasi / Ms Moside Nhlape	Statistics South Africa	maletelat@statssa.gov.za mosidin@statssa.gov.za
Secretariat		
Dr Gail Andrews	National DoH	andreg@health.gov.za
Ms Thulile Zondi	National DoH	zondit@health.gov.za
Mr Thabo Molebatsi	National DoH	molebt@health.gov.za
Mr Jacques Van der Westhuizen	National DoH	vanderj@health.gov.za
Mr Ronald Maluleke	National DoH	malulr@health.gov.za

Sub-committee 1 (Outputs 1 and 2: Extending life expectancy and reducing maternal and child mortality) **Chairperson**: Dr Bradshaw (SAMRC) **Members**: Prof Zuma (HSRC), Ms Masiteng (Stats SA), Dr Tuoane-Nkhasi/ Ms Moside Nhlape (Stats SA), Prof Dorrington (UCT), Prof Labadarios (HSRC), Prof Kahn (Wits), Dr Mabugu (FFC), Mr Masilela (Presidency), Ms Day (HST), Ms Zondi (NDoH),
Sub-committee 2 (Output 3: Combating HIV and AIDS and decreasing the burden of tuberculosis) **Chairperson**: Prof Rees (Wits) **Members**: Prof Zuma (HSRC), Dr Lombard (SAMRC), Dr Tuoane-Nkhasi (Stats SA), Mr Masilela (Presidency), Prof Dorrington (UCT), Dr Bradshaw (SAMRC), Prof Kahn (Wits), Dr Patel (BHF), Ms Masiteng (Stats SA), Mr Dlamini (DOH), Dr Shaw (HISP)
Sub-committee 3 (Output 4: Strengthening health systems effectiveness) **Chairperson:** Mr Masilela (Presidency), Dr Lombard (SAMRC) **Members:** Prof Zuma (HSRC), Dr Mabugu (FFC), Dr Bradshaw (SAMRC), Prof Labadarios (HSRC), Ms Candy Day (HST), Dr Shaw (HISP), Dr Boraine (Presidency), Ms Zondi (NDoH)
Sub-committee 4 (Monitoring the performance of the health system) **Chairperson**: Dr Shaw (HISP) **Members**: Prof Rees (Wits), Dr Lombard (SAMRC), Dr Bradshaw (SAMRC), Prof Labadarios (HSRC), Ms Slabbert (HASA), Mr Masilela (Presidency), Ms Day (HST), Dr Boraine (Presidency), Ms Zondi (NDoH), Ms Lupindo (Presidency), Mr Prior (LHC), Dr M Hoohloo (CMS), Dr Patel (BHF)

Content advisors to HDACC		
Dr Fareed Abdullah	SANAC	fabdullah@sanac.org.za
Dr Andrew Black	University of Witwatersrand	ablack@wrhi.ac.za
Dr Andrew Boulle	University of Cape Town	andrew.boulle@uct.ac.za
Prof Francesco Conradie	University of Witwatersrand	fconradie@witshealth.co.za
Mr Sicelo Dlamini	National DoH	dlamis@health.gov.za
Dr Lee Fairlie	University of Witwatersrand	lfairlie@wrhi.ac.za

Annexure 2: Terms of Reference of the Health Data Advisory and Co-ordination Committee

An extensive list of activities were provided to the committee as Terms of Reference which were refined by the committee into the following:

(1) Identifying and reviewing the key indicators to monitor the NSDA.

(2) Identifying and reviewing available data for these indicators.

(3) Advising on targets, and any other issues pertinent to the NSDA and MDGs.

(4) Identifying appropriate estimates for baseline.

(5) Identifying data needs for future measurement of indicators in the following categories:

- Strengthening vital statistics
  - Review Home Affairs forms
  - Improve coverage of birth and death registration
  - Improve quality of statistics
  - Improve utility of statistics for monitoring and planning
- Strengthening national population-based health surveys including:
  - HIV prevalence survey
  - SADHS
  - SANHANES
- Strengthening routine health information
  - Antenatal care HIV prevalence survey
  - TB register
  - DHIS
  - Private sector and Public sector information on quality.

The following detailed activities were included as the Terms of Reference for the committee:

(a) to assign institutions that should deliver some key figures that would be informative for the committee, working hand in hand with STATSSA. The work done by STATSSA was considered valuable and could be further supportive to the work of this committee.

(b) in the absence of the SADHS, the committee needs to identify sources of data so that the country can have some sense of the maternal mortality ratio; the infant mortality ratio; the under-5 mortality rate and life expectancy statistics in 2010.

(c) track progress in terms of Millennium Development Goals (MDGs) that are related to health, and also use this opportunity to engage other stakeholders, particularly on the MDGs that are health-related.
(d) deal with demographic data as it relates to health with regard to key indicators.
(e) deal with the NSDA outcomes which are the main TORs in the short-term. MDGs are long-term Terms of Reference up to 2014.
(f) develop new tools that should enable the committee to have data, which are up to date and look at the circle of all the relevant surveys. Where it is found that there are tools that exist but need updating in terms of including variables that should be done.
(g) Statistics SA to commit to improving time-lags by reducing it from two to at least one year.
(h) look at the processes involved and identify where the hurdles are and advise accordingly.
(i) HST to assist in the areas dealing with community health care workers since they have projects dealing with the same subject.
(j) review the Home Affairs forms and include variables that will collect required health data.
(k) look at what the sources and reasons for under-reporting are.
(l) look at measures to improve adjustments of figures in order to solve the problem.
(m) show what demographic indicators look like.
(n) evaluate the quality of the demographic data.
(o) determine indicators that should be estimated in the country.
(p) determine the model that South Africa should use to deal with the maternal mortality ratio in the country.
(q) identify the different data sources and see who is producing which statistics.
(r) develop a working programme for the next six months (short-term) and another for up to 2014 (long-term).
(s) draft the report that should help to correct data in the country.
(t) develop a proposal to work with Home Affairs in order to access data in their warehouse (including maps) and provide recommendations on data that are reported from the rural areas.
(u) look at the key indicators, which are on the MDG report.
(v) advise the DOH on issues pertinent to NSDA and therefore to determine realistic indicators especially because the NSDA is a Service Level Agreement.
(w) inform DOH if targets are not achievable.
(x) monitor indicators against targets.

(y) look at, for example MDG indicators in order to be able to tell if an indicator can be anticipated to be halved by 2015.

Annexure 3: Information for 2014 and 2015 for selected indicators

Table 8 updates: Health sector outputs, indicators, targets, values and data sources (Output 3)

OUTPUT	INDICATOR	2014	2015	SOURCE OF DATA
3. **COMBATING HIV AND AIDS**	3.2 Rate of mother-to-child transmission of HIV <2 months of age	1.5%	1.5%	DHIS NDOH
	3.4 Total number of patients (adults and children) on ART	3 076 680	3 407 956	Three-tier data system to be set up nationally to report from June 2012 in DHIS National DoH CCMT
	3.5 Medical male circumcisions	505 045	464 629	DHIS NDoH
DECREASING THE BURDEN OF TUBERCULOSIS	3.6 Proportion of TB treatment success among **all** TB cases*	77.9%	77.5%	ETR.Net Report: Summary treatment outcome for cohort: All TB cases NDoH
	3.7 TB loss to follow-up (default) rate at the end of TB treatment among **all** TB cases*	6.3%	6.0%	ETR.Net Report: Summary treatment outcome for cohort: All TB cases NDoH
	3.8 Percentage of HIV-TB co-infected patients who are on ART on completion of drug-sensitive TB treatment*	77.8%	88.3%	ETR.Net: TB/HIV Report NDoH
	3.9 Percentage of diagnosed MDR-TB patients who are enrolled in a TB treatment programme***	46.6%	47.1%	MDR treatment register NDoH

*TB treatment outcome data are reported for the cohort commencing treatment in year indicated by the column, i.e. data only available 12 months later for drug-sensitive TB, and 24 months for drug-resistant TB.

**The variation in this indicator probably reflects the fact that the data collection tool, EDR.Web, was introduced and implemented at different times in different provinces. There is a data mopping exercise in place to rectify this.

Table 9 updates: Health sector outputs, indicators, targets, values and data sources (Output 4)

OUTPUT	INDICATOR	2014	2015	SOURCE OF DATA
RE-ENGINEERING PHC SYSTEM	4.1 Primary health care utilisation rate	2.4 visits per person per annum	2.3 visits per person per annum	DHIS NDoH
	4.2 OPD clinic new case not referred rate	49.0%	47.1%	DHIS NDoH