

HEALTH POLICIES AND PRACTICE

Can disease control priorities improve health systems performance in South Africa?

L C Rispel, P Barron

Improving health systems performance in order to achieve good health care outcomes and meet the Millennium Development Goals (MDGs) has received increased global attention. Using the World Health Organization (WHO)'s framework on health system strengthening, an overview is presented of key aspects of performance of the South African (SA) health system that are likely to impact on the Disease Control Priorities (DCP) initiative.

SA is gripped by a complex disease burden, consisting of the twin epidemics of HIV and tuberculosis, as well as non-communicable diseases and injuries. Despite an enabling legal and policy framework, health system challenges include sub-optimal leadership, insufficient resources for many national policies, lack of a broad public health approach to service delivery, and poor utilisation of existing information for decision-making.

Provided that these and other health systems issues are addressed, cost-effectiveness studies and interventions may be beneficial in improving the functioning of the health system in SA and in getting better value for money.

Background

In the past few decades, the combination of biomedical and technological advances, a substantial increase in global knowledge to improve population health, and improved access to primary health care, essential drugs, water and sanitation has resulted in aggregate worldwide improvements in the health of individuals and communities.^{1,2} However, this progress has been marred by a multiplicity of factors, including globalisation, changing burden and complexity of disease profiles, inequalities between and within

countries, and inadequate or poorly performing health systems.¹ Common shortcomings of contemporary health systems include fragmented, unsafe and misdirected care, which mitigates against a comprehensive and balanced response to health needs.¹

Improving health systems performance to achieve good health care outcomes and meet the MDGs has received increased global attention, especially in the last decade.^{1,3-9} In SA, the current health political leadership has committed itself to a substantial overhaul of the public health sector in order to address the complex burden of disease; improve health outcomes, access and affordability; and ensure responsiveness to the needs of the population.¹⁰ The DCP project in SA aims to determine which effective interventions should be included in a package of care that offers the greatest gain in health (or averted disease burden) per SA rand spent.¹¹ The DCP can contribute to health policy changes and improve and prioritise health resource allocation and spending provided that it takes account of the existing issues and challenges in the health system and pays attention to process and those stakeholders who have the potential to take forward, block or challenge policy change or implementation.

Using the WHO's framework on health systems strengthening, we present an overview of key aspects of performance of the SA health system that are likely to impact on DCP-SA. Critical issues are suggested that must be taken into account in the execution of DCP-SA.

Measuring health systems performance

The measurement of health systems performance is not straightforward, as health systems are complex, consisting of all organisations, people and actions whose primary intent is to promote, restore or maintain health.⁶⁻⁸ Measurement tends to focus on the provision of health services and is often hampered by data problems, the difficulty of defining measurable objectives in a reliable and valid manner, and the challenge of capturing social determinants of health and community experiences.¹²⁻¹³ The WHO health systems strengthening framework, despite critique of its limitations, is useful in focusing attention on the performance of the health system by linking system building blocks, performance elements and overall outcomes, including population health status.⁸

An adaptation of the WHO framework is shown in Fig. 1⁸ and consists of the following:

Health system building blocks. These include six building blocks of service delivery; human resources (health workforce); finances; medical products, vaccines and technology; information; and leadership and governance.

Health delivery platforms include the district health system; hospitals; and the private sector (both for-profit and non-profit organisations).

Health system performance includes equitable access, coverage, quality and safety.

System outcomes include improved health (level and distribution); social and financial risk protection; responsiveness; and improved efficiency.

Laetitia Rispel is adjunct Professor in the Centre for Health Policy, School of Public Health, University of the Witwatersrand, Johannesburg, current President of the Public Health Association of South Africa (PHASA), and the principal investigator of a large research programme on Human Resources for Health (HRH). She was Executive Director of the Social Aspects of HIV/AIDS and Health Research Programme at the Human Sciences Research Council, and was head of the Gauteng provincial health department from 2001 until 2006.

Peter Barron is a medical doctor, public health specialist and previous accountant with more than 30 years of public health sector experience, both as a clinician and manager in local and provincial government. The main focus of his recent work has been around improving the quality of care at primary care level and implementation of a district health system in South Africa. He has published widely on immunisation, maternal and child health, district health, quality of care, health information systems and health service delivery.

Corresponding author: Laetitia Rispel (laetitia.rispel@wits.ac.za)

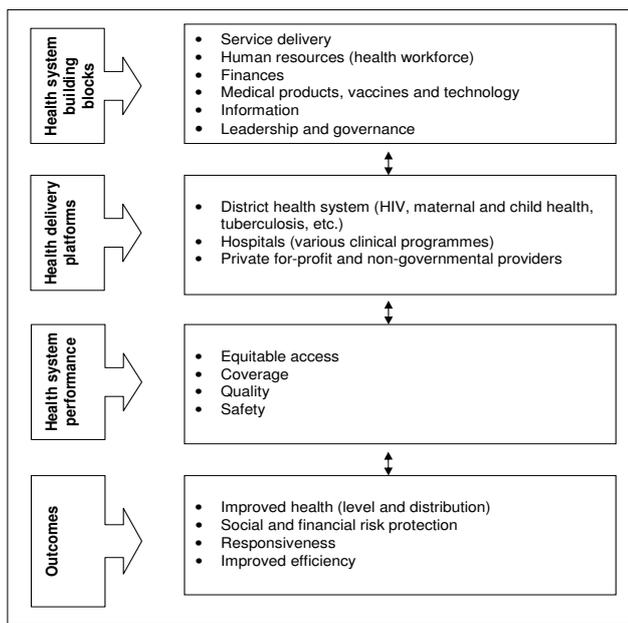


Fig. 1. World Health Organization health systems framework (source: re-drawn and adapted from WHO, 2007).⁸

Assessing the South African health system

System building blocks

The democratic SA government inherited a highly fragmented health system in 1994, with wide disparities in health spending and inequitable distribution of health care professionals. There were inequities in access to and quality of care between and within provinces; between black and white; between urban and rural areas; and between the public and private health sectors.^{3,6,14-16} Transformation efforts in the health sector spanning more than 15 years include numerous structural, legislative and policy changes, overcoming apartheid in health services, implementation of health programmes for priority conditions, and improvements in access to health care services.^{6,17} There have been numerous positive developments and improvements in the lives of South Africans since the country's democratic transition.^{15,18-19} However, urban/rural and public/private inequities remain acute, and are exacerbated by numerous health system challenges.¹⁹⁻²²

An enabling legal and policy framework is in place, and there have been many areas of progress (Table I). At the same time, significant health system challenges for each of the six health system building blocks need to be addressed.^{10,20,22}

Delivery platforms

Resources are being inequitably and inefficiently used in the SA health system. Specific examples of primary care, district and central hospitals follow.

Table II shows the district primary health care spending trends.²³ The districts are categorised from highest to the lowest spending per capita. Paradoxically, from an equity perspective, some of the largest percentage increases occur in districts that are already spending higher than the average per capita.²³ The data highlight the marked differences in spending on primary health care.

Fig. 2 shows the cost of keeping an average patient in a district hospital for one day, the patient-day equivalent (PDE), an indicator showing on average how much it costs for one patient to spend one day in the hospital. This figure illustrates the wide differences between districts, which conceal the even greater differences between

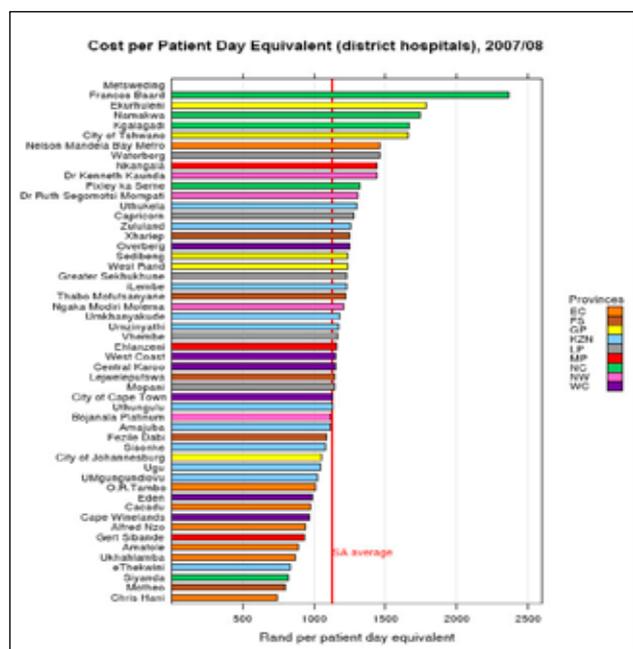


Fig. 2. Cost per patient-day equivalent at district hospitals, 2007/8 (source: Day et al., 2009²⁴).

individual hospitals. Even in the same province there is a wide range. For example, in the Eastern Cape the cost per PDE in Nelson Mandela Bay Metro is twice as high as in Chris Hani.²⁴

As district hospitals consume over 40% of total district resources, the wide ranges in PDE are of great concern. Costs at the high end may indicate lack of efficiency or leakage out of the system, while costs at the low end may indicate poor quality of care.

Table III shows selected indicators in a sample of tertiary hospitals.²² Focusing on the cost per PDE indicates a wide range of potential inefficiencies in the system. Some central, academic hospitals in KwaZulu-Natal and the Free State are more expensive than those in the Western Cape and Gauteng, partly because the institutions are not working at optimal capacity.²²

These differences point to poor monitoring and accountability at all levels of the system.

How healthy are South Africans?

Health outcomes in SA are poor and not commensurate with the level of health expenditure in the country. Scientists have described a quadruple burden of diseases in SA, comprising HIV and AIDS, poverty-related diseases, chronic diseases of lifestyle and high rates of injury.^{15,20,25}

SA has an estimated 5.5 million people living with HIV, with an HIV prevalence of close to 30% of all public sector antenatal clinic attendees, and wide geographical differences.²⁶ The rise of HIV prevalence has been followed relentlessly by a threefold increase in the incidence of tuberculosis (TB) from 1996 to 2006 (Fig. 3).²⁷ Mortality statistics show an increase in deaths due to TB, from 13.1% of all deaths in 1997 to 25.5% in 2005, and deaths due to pneumonia increased from 4.8% in 1997 to 8.7% in 2005.²⁸ These large increases are almost certainly due to the classification of AIDS-related illnesses into these categories.

After HIV and AIDS deaths (29.8%), cardiovascular disease (16.6%), infectious and parasitic diseases (10.3%), malignant neoplasms (7.5%), intentional injuries (7.0%) and unintentional injuries (5.4%) were the leading cause of death in 2000.²⁵ Hence, non-communicable diseases (NCDs) and injuries constitute a growing

Table I. Assessing health system building blocks in South Africa

Building block	Elements of progress	Key issues/challenges
Leadership and governance	<ul style="list-style-type: none"> • Enabling legal, policy and fiscal environment • Existence of inter-governmental health structures • Visible political leadership in fourth term of government • Commitment to strengthen public health sector • Keeness and willingness to correct past mistakes 	<ul style="list-style-type: none"> • Lack of a single national health vision and strategy for the achievement of population health outcomes and ongoing health system transformation • Fragmentation between national, nine provincial and numerous municipal health departments • Resource allocation structurally disconnected from national policies • Loss of institutional and organisational health system focus, with weak systems at all levels of the health sector • Domination of disease-specific processes to the detriment of health system functions • Sub-optimal stewardship and leadership to ensure sufficient resources for a range of national policies • Hitherto antagonistic approach to dealing with key stakeholders • Private sector inadequately regulated • Difficult to attribute responsibility/accountability for performance
Service delivery	<ul style="list-style-type: none"> • Comprehensive and wide range of services available through the public sector • Five year national strategic plans to address HIV and AIDS; TB • Leader in a number of areas, e.g. system of confidential enquiry into maternal deaths, antiretroviral treatment for those in need of care, etc. 	<ul style="list-style-type: none"> • Lack of broader public health approach to service delivery • National affordable, costed norms, standards and guidelines not available in many areas • Few synergies between key programme clusters, e.g. HIV, TB and MCH managers, resulting in missed opportunities to improve health outcomes at reduced costs • Implementation sub-optimal and varies considerably across the nine provinces • Insufficient attention to quality at delivery levels • Little recognition of the inter-connectedness of different components of the health system, and links between high level policies and implementation
Human resources	<ul style="list-style-type: none"> • Enabling legislation • Overall national human resource framework • Strong health science training faculties and generally good training infrastructure • Numerous efforts to improve conditions of service of health care professionals, with occupation-specific dispensations the latest policy initiative 	<ul style="list-style-type: none"> • Poor co-ordination of health science education and training between departments of Health and Education and higher education institutions • Inadequate production of health professionals in a number of key categories • Declining numbers and capacity of teaching faculty in major disciplines • Training perceived to be irrelevant to the requirements of the health sector in terms of burden of disease (curriculum content) and the district-based design of the health system (sites of training) • Lack of alignment and integration of community health workers and mid-level workers into the health system • Less than optimal co-ordination and management of human resources across the three spheres of government • Huge inequities in the human resource availability between private and public sectors; urban and rural areas • Major leadership challenges at almost all levels of the health system, exacerbated by weak personnel management systems • High degree of centralisation, with HR delegations withdrawn in most provinces • Migration and high attrition of highly skilled professionals • Insufficient attention on impact of HIV and AIDS on the health workforce • Lack of motivation and poor morale • Inappropriate and inefficient use of available human resources

Table I. Assessing health system building blocks in South Africa (continued)

Building block	Elements of progress	Key issues/challenges
Finance	<ul style="list-style-type: none"> • Enabling legislation • 8% of gross domestic product spent on health • Public sector spending on health has improved to almost 14% and fairly constant over the period 2004 - 2011 ~ in line with the call of the African Union to spend 15% of total budgets on health • The ratios between the best resourced province and the worst resourced province have decreased from 3.8 to 1.6 between 1995/96 and 2007/08 • Prioritisation of district health services and emergency medical services over provincial and central hospital services 	<ul style="list-style-type: none"> • Around 55 - 60% spent in the private sector, which covers less than 20% of the population • Relatively poor performance for the cost per capita inputs invested • Lack of alignment between annual health budgets and strategic and operational plans • Determination and allocation of conditional grants not sufficiently objective and quantifiable • Numerous 'unfunded mandates' put significant pressures on the allocated health budget • Chronic overspending in the majority of provinces, the exact amount significantly understated • Costing of health sector activities and interventions is deficient • Inadequate financial management, reporting and accountability processes
Medical technology, vaccines	<ul style="list-style-type: none"> • Enabling legislation, aimed to improve access to essential medicines • Essential drug lists institutionalised • Centralised procurement system in public sector • Single exit price for medicines 	<ul style="list-style-type: none"> • Insufficient prioritisation of pharmaceuticals • Shortage of medicines, particularly in rural areas • Sub-optimal supply chain processes including pro-active planning, stock control and distribution processes • Inadequate analysis, interpretation; and utilisation of information for decision making • Poor quality control of existing data collection • Performance in relation to health priorities not quantified or quantifiable
Information	<ul style="list-style-type: none"> • District Health Information System (DHIS) well-established data collection system, with great potential as a comprehensive system of routine data collection • Significant time and resource investment in data collection, capture and collation 	<ul style="list-style-type: none"> • Insufficient linkages between health information, human resource and financial information systems

Sources: Department of Health, 2010;¹⁰ Development Bank of South Africa, 2008;²⁰ Integrated Support Teams, 2009;²² Day *et al.*, 2009.²⁴

public health problem, which must be addressed at the same time as HIV and TB.²⁹

Implications for DCP in South Africa

This assessment paints a picture of a society that is gripped by a complex disease burden: the twin epidemics of HIV and TB, coupled with non-communicable diseases and injuries. The health system is inordinately complex. Visible and decisive leadership is needed to contextualise and prioritise the interventions required to improve the health system and the health status of South Africans.²²

Although considerable resources are being spent on health and there have been massive improvements in reducing inequitable spending, there are still large disparities exemplified by the per capita expenditure on non-hospital primary health care.²³⁻²⁴

Data from district hospitals point to large-scale inefficiencies among individual hospitals and also among different provinces. Cost-

effectiveness studies and interventions may improve the functioning of the health system in SA and get better value for money. However, key issues must be taken into account in any DCP initiative that is taken forward:

- The risk of emphasising selective interventions in health care delivery, inherent in the cost-effectiveness approach. Hence, any DCP project should take into account the complex disease burden and existing challenges in the health system, and aim to analyse the *cost-effectiveness of integrated services*.
- The technical complexity and enormous data inputs required for cost-effectiveness analyses. The project should ensure that due emphasis is placed both on *building local capacity* at universities, and on building capacity within government to utilise the information.
- *The reality that budgeting and planning is not zero-based*, i.e. future planning must take into account existing services and systems. Therefore the information gathered in the cost-effectiveness

Table II. District primary health care spending per capita (rands), 2005/06 - 2007/08*

District	2005/06	2006/07	2007/08	Annual real growth 2005/06 - 2007/08	
DC6	Namakwa	415	498	633	16.3
DC5	Central Karoo	294	321	526	26.1
DC1	West Coast	373	464	466	5.3
CPT	City of Cape Town	354	384	445	5.6
DC4	Eden	325	347	435	9.0
DC43	Sisonke	239	273	416	24.3
DC38	Ngaka Modiri Molema (Central)	280	328	398	12.2
DC16	Xhariep	331	361	387	1.9
DC7	Pixley ka Seme	236	294	376	18.9
JHB	City of Johannesburg	288	313	371	7.1
DC39	Dr Ruth Segomotsi Mompati (Bophirima)	379	320	367	-7.2
ETH	eThekwini	282	305	365	7.2
DC45	Kgalagadi	253	277	353	11.3
DC2	Cape Winelands	272	291	353	7.4
DC40	Dr Kenneth Kaunda (Southern)	292	311	342	2.1
DC27	Umkhanyakude	273	308	340	5.1
DC10	Cacadu	193	223	339	24.7
TSH	City of Tshwane	245	311	335	10.3
DC3	Overberg	212	246	320	15.6
DC9	Frances Baard	202	261	314	17.6
DC29	iLembe	195	217	310	19.0
DC12	Amathole	251	265	305	3.9
DC13	Chris Hani	235	256	303	7.1
DC36	Waterberg	187	205	303	20.0
DC34	Vhembe	217	203	301	10.9
DC37	Bojanala Platinum	222	280	290	7.9
DC33	Mopani	218	235	290	8.7
DC46	Metsweding	198	150	287	13.4
DC26	Zululand	201	216	280	11.2
DC28	Uthungulu	227	229	278	4.2
DC23	Uthukela	171	195	277	19.7
DC22	Umgungundlovu	216	236	276	6.4
DC17	Motheo	254	296	274	-2.1
EKU	Ekurhuleni	243	286	273	-0.2

Table II. District primary health care spending per capita (rands), 2005/06 - 2007/08* (continued)

District	2005/06	2006/07	2007/08	Annual real growth 2005/06 - 2007/08	
DC21	Ugu	204	217	272	8.9
NMA	Nelson Mandela Bay Metro	220	241	264	3.1
DC24	Umzinyathi	198	227	263	8.7
DC35	Capricorn	165	193	256	17.6
DC32	Ehlanzeni	164	187	256	17.8
DC14	Ukhahlamba	186	209	239	6.6
DC48	West Rand	242	221	236	-6.9
DC42	Sedibeng	188	196	233	4.9
DC20	Fezile Dabi	228	222	230	-5.3
DC31	Nkangala	160	195	226	12.1
DC15	O.R. Tambo	188	199	223	2.4
DC47	Greater Sekhukhune	121	163	221	27.2
DC25	Amajuba	151	177	220	13.6
DC30	Gert Sibande	137	185	211	16.9
DC19	Thabo Mofutsanyane	206	213	211	-4.6
DC8	Siyanda	119	150	206	23.8
DC44	Alfred Nzo	177	202	198	-0.5
DC18	Lejweleputswa	187	190	191	-4.7
	Total	232	256	302	7.6

* Ranked from highest to lowest per capita spending in 2007/08. Includes five core sub-programmes and local government, but excludes health facilities management, PHC training, HIV and AIDS and district hospitals sub-programmes.

Source: Bletcher *et al.*, 2008.²³

exercise must reflect the costs of adjusting the supply of a particular intervention upwards or downwards from its current level.

- The DCP should assist with the *development of appropriate staffing models*.
- The DCP should assist with *discontinuation of health care interventions/activities* that add no value to health outcomes.
- The DCP must recognise that society often places a disproportionate value on certain sorts of treatment, including expensive life-saving care. The approach should take into *account public values and professional opinion* and pay due attention to the context and processes of decision-making.
- Few developing countries have a comprehensive monitoring and evaluation system, existing systems suffer from lack of co-ordination and are often paper-based, and information generated has problems of quality, completeness, timeliness and duplication. The DCP should facilitate the development of a streamlined system, rather than exacerbate existing data requirements
- Lastly, the DCP should recognise that a technical approach to health sector priorities based on burden of disease and cost-effectiveness analysis should not be a rigid prescription for all health system ailments, but is only one input to the policy process.⁴

Table III. Bed utilisation rate and cost per patient-day equivalent in selected tertiary hospitals

Province	Hospitals	2005/06		2006/07		2007/08	
		BUR (%)	PDE cost (R)	BUR (%)	PDE cost (R)	BUR (%)	PDE cost (R)
Eastern Cape	Nelson Mandela	81	n/a	76	n/a	69	n/a
	Port Elizabeth Provincial Hospital	60	n/a	69	n/a	68	n/a
Free State	Universitas	61	n/a	68	2 735	71	3 089
Gauteng	Chris Hanani Baragwanath	85	n/a	74	1 577	75	1 843
	Charlotte Maxeke Johannesburg Academic	86	n/a	85	2 043	81	2 366
	Steve Biko Academic (Pretoria)	77		76	2 206	74	2 100
KwaZulu-Natal	Grey's Hospital	67		73	1 585	74	2 107
	Inkosi Albert Luthuli Central Hospital	42	n/a	46	4 259	41	5 299
Limpopo	Pietersburg Hospital (Polokwane)	71	n/a	75	1 545	64	2 147
Mpumalanga	Witbank	71	n/a	70	1 857	69	2 094
Western Cape	Groote Schuur	83	n/a	82	2 195	81	2 513
	Red Cross Children's War Memorial	81	n/a	84	2 137	81	2 487
	Tygerberg	80	n/a	81	2 102	79	2 395

Source: Integrated Support Teams, 2009.²²
 BUR = bed utilisation rate; PDE = patient-day equivalent; n/a = not available.

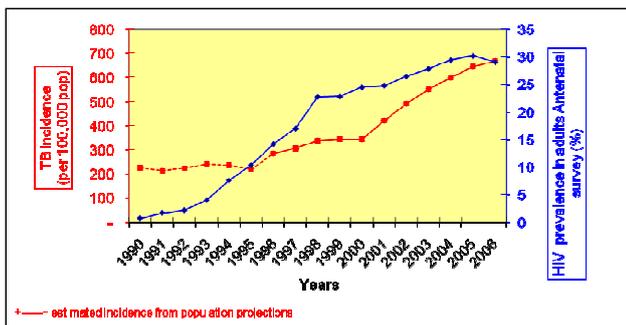


Fig. 3. Trend of incidence of tuberculosis and HIV prevalence (source: Department of Health, 2008²⁷).

We would like to thank Professors Karen Hofman and Steve Tollman for their encouragement and support. This paper is based on a longer report entitled: 'Overview of health care and the health system in South Africa: Implications for the Disease Control Priorities (DCP) project', done as part of the launch of the Priority Cost Effective Lessons for Systems Strengthening (PRICELESS) South Africa initiative, August 2009. The report was funded by the Fogarty International Center at the US National Institutes of Health and the Bill and Melinda Gates Foundation.

- World Health Organization. The World Health Report 2008: Primary Health Care, Now More Than Ever. Geneva: WHO, 2008.
- Beaglehole R, Bonita R. Global public health: a score card. *Lancet* 2008;372:1988-1996.
- Barron P, Roma-Reardon J, eds. *South African Health Review 2008*. Durban: Health Systems Trust, 2008.
- Murray CJ, Kreuser J, Whang W. Cost-effectiveness analysis and policy choices: investing in health systems. *Bull World Health Organ* 1994;72:663-674.
- Rispel L, Setswe G. Stewardship: Protecting the public's health. In: Harrison S, Bhana R, Ntuli A, eds. *South African Health Review 2007*. Durban: Health Systems Trust, 2007.
- Schneider H, Barron P, Fonn S. The promise and practice of transformation in South Africa's health system. In: Buhlungu S, Daniel J, Southall R, Lutchman J, eds. *State of the Nation: South Africa 2007*. Cape Town: Human Sciences Research Council, 2007.

- World Health Organization. *World Health Report 2000: Health Systems: Improving Performance*. Geneva: World Health Organization, 2000.
- World Health Organization. *Everybody's Business. Strengthening Health Systems to Improve Health Outcomes: WHO's Framework for Action*. Geneva: World Health Organization, 2007.
- Travis P, Bennett S, Haines A, et al. Overcoming health system constraints to achieve the Millennium Development Goals. *Lancet* 2004;364:900-906.
- Department of Health. *National Department of Health Strategic Plan 2010/11-2012/13*. Pretoria: Department of Health, 2010.
- Hoffman K. Scope and expectations of the South Africa Country Study. Paper presented at the launch workshop entitled 'Setting priorities for health: Crafting a South Africa-specific strategy', 10 - 12 August 2009, Mount Grace Country Hotel, Magaliesberg.
- Loeb JM. The current state of performance measurement in health care. *Int J Qual Health Care* 2004;15:i5-i9.
- Navarro V. The new conventional wisdom: An evaluation of the WHO report Health systems: Improving performance. *Int J Health Serv* 2001;31:23-33.
- Chopra M, Lawn JE, Sanders D, et al. Achieving the health Millennium Development Goals for South Africa: challenges and priorities. *Lancet* 2009;374:1023-1031.
- Coovadia H, Jewkes R, Barron P, Sanders D, McIntyre D. The health and health system of South Africa: historical roots of current public health. *Lancet* 2009;374:817-834.
- Shisana O, Rehle T, Louw J, Zungu-Dirwayi M, Dana P, Rispel L. Public perceptions on national health insurance: Moving towards universal health coverage in South Africa. *S Afr Med J* 2006;96:814-818.
- Health Systems Trust. *South African Health Reviews*. Durban: HST, 1995-2008.
- Buhlungu S, Daniel J, Southall R, Lutchman J, eds. *State of the Nation: South Africa 2007*. Cape Town: Human Sciences Research Council, 2007.
- Statistics South Africa. *Achieving a Better Life for All: Progress between Census 1996 and 2001*. Pretoria: Statistics South Africa, 2005.
- Development Bank of South Africa. *Health Sector Roadmap*. Johannesburg: DBSA, 2008.
- Gilson L, McIntyre D. *South Africa: The legacy of apartheid*. In: Evans T, Whitehead M, Diderichsen F, Bhuiya A, Wirth M, eds. *Challenging Inequities in Health: From Ethics to Action*. New York: Oxford University Press, 2001.
- Integrated Support Teams. *Review of Health Over-spending and Macro-assessment of the Public Health System in South Africa: Consolidated Report*. Pretoria: ISTS, 2009.
- Bletcher M, Day C, Dove S, Cairns R. Primary health care financing in the public sector. In: Barron P, Roma-Reardon J, eds. *South African Health Review 2008*. Durban: Health Systems Trust, 2008.
- Day C, Barron B, Montecelli F, Sello E, eds. *District Health Barometer 2007/8*. Durban: Health Systems Trust, 2009.
- Bradshaw D, Nannan N, Groenewald P, et al. Provincial mortality in South Africa 2000 - priority setting for now and a benchmark for the future. *S Afr Med J* 2005;95:496-503.
- Department of Health. *National HIV and Syphilis Antenatal Prevalence Survey, South Africa 2008*. Pretoria: Department of Health, 2009.
- Department of Health. *Tuberculosis Strategic Plan for South Africa, 2007-2011*. Pretoria: Department of Health, 2008.
- Statistics South Africa. *Mortality and Causes of Death in South Africa, 2003-2004*. Pretoria: Statistics South Africa, 2006.
- World Health Organization. *2008-2013 Action Plan for the Global Strategy for the Prevention and Control of Non-communicable Diseases*. Geneva: World Health Organization, 2008.