Determinants of Health and their Trends

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Abstract

Despite uncertainty about the exact levels of mortality, it is clear that the health of the South African population has worsened in the last decade. South Africa can be considered to have a quadruple burden of disease, including diseases and conditions related to poverty and under-development, chronic diseases, injuries and HIV and AIDS. The spread of HIV has been extremely rapid with an extensive impact, particularly among young adults and children. Differentials in health status have been observed between population groups, wealth groups, urban-rural and education levels. Globally, there has been a renewed interest in the determinants of health, including social determinants. A review of South African trends shows that economic and social policies have resulted in economic growth and some improvements in access to basic services such as water, sanitation and electricity. Increased provision of social grants, extreme wealth inequalities and high unemployment likely play an important role in poor health outcomes. Cultural and macro-social trends are difficult to capture, but of obvious concern to health are the culture of violence and the lower social status afforded to women. The theoretical understanding of health and its determinants is not completely formed. Nonetheless, the World Health Organization Commission on Social Determinants of Health argues that there is enough evidence for governments to take action following three principles: improving the daily living conditions of people; reducing health inequalities; and strengthening the ability to monitor population health. A revitalised Alma Ata provides an aspirational charter to build primary curative and preventive care accompanied by intersectoral action linking health and action.
Introduction

The report of the World Health Organization’s (WHO) Commission on Macroeconomics and Health reviewed the evidence on the relationship between poverty and health, and highlighted the essential role of investing in health to promote development and reduce poverty.\textsuperscript{1} The subsequent Commission on Social Determinants of Health was established to draw attention to the social determinants of health including: the social and economic environment; the physical environment; and the person’s individual characteristics and behaviours (i.e. the ‘causes of the causes’ of ill-health).\textsuperscript{2} There is increasing understanding that medical and public health interventions will have limited impact without taking into account these determinants and goals of equity.

This chapter aims to consider the progress that has been made in the 14 years of democracy in terms of the broader determinants of health, and to reflect on changes in health status in post-apartheid South Africa. A simple framework identifying the factors that influence population health is used and available data from Statistics South Africa (StatsSA), the South Africa Demographic and Health Surveys (SADHS) and other sources are used to appraise trends. Development reviews, such as the mid-term review of development indicators, and the macro-social review conducted by government, as well as studies that have synthesized the burden of disease information are also used.\textsuperscript{3,4}

Framework for the determinants of health

2008 marks the 30th anniversary of the call for ‘Health for All’ made at the Alma Ata conference on Primary Health Care (PHC).\textsuperscript{5} The declaration reaffirmed that health, which is a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity, is a fundamental human right. Building on a model of comprehensive PHC that was developed in South Africa by Dr Sidney Kark and colleagues during the 1940s, the conference declared that “the promotion and protection of the health of the people is essential to sustained economic and social development and contributes to a better quality of life and to world peace”.\textsuperscript{5,6} Recognising the important role of other determinants of health, the conference called for the intersectoral collaboration involving “all related sectors and aspects of national and community development, in particular agriculture, animal husbandry, food, industry, education, housing, public works, communications and other sectors”.\textsuperscript{5}

Although health and social services make important contributions to health status, most of the determinants of health lie outside the direct influence of health and social care. For example, education, employment, housing and environment have significant impacts on health.\textsuperscript{2} Often called ‘upstream’ or ‘distal’ factors, the pathways between these determinants and ill-health are extremely complex and are certainly not linear. Understanding of these relationships is important as it will inform the response needed to improve health and reduce inequalities. Kreiger argues that societal patterns of disease represent the biological consequences of the ways of living and working differentially afforded to social groups, and that these social groups are produced by political and economic forces in society.\textsuperscript{7} She presents an ‘ecosocial’ model that includes embodiment, pathways of embodiment, cumulative interplay of exposure, susceptibility and resistance, accountability and agency, in the context of multiple levels. She makes the point that we should use explicit language about levels, pathways and power. The Commission on Social Determinants on Health concludes that there is enough evidence on the social determinants for governments and society to take action.\textsuperscript{8} However, they also call for the generation and sharing of new evidence on the ways in which social determinants influence population health and health equity, and on the effectiveness of measures to reduce health inequities through action on social determinants.

The rainbow diagram by Dahlgren and Whitehead shown in Figure 1 provides a simple model in terms of layers of influence, starting with the individual and moving to wider society.\textsuperscript{9} It is by no means an explanatory model, but is used here as a simple framework to organise the review of the trends in the broader determinants of health in the post-apartheid period. The determinants include: general socio-economic factors, cultural and environmental factors; living and working conditions; social and community factors; and individual lifestyle factors. This is followed by a review of health status in South Africa. While some connections can be made between the living conditions and health status, it is not in the scope of this chapter to extrapolate the linkages. Recommendations are guided by the final report of the WHO Commission on Health and reflecting back on the principles of Alma Ata.\textsuperscript{5,8}
General socio-economic, cultural and environmental conditions

South Africa has a well-established economy and is classified as a middle income country. The Reconstruction and Development Policy guided early policy changes adopted by the post-apartheid government. These emphasised redistribution and access to basic services. By 1996, the Growth, Employment and Redistribution (GEAR) strategy incorporating tight fiscal policies was adopted in an attempt to prioritise economic development and encourage foreign investment. However, average growth in per capita gross domestic product (GDP) was low in the early post-apartheid period and by 1998 had become negative. This was turned around and since 2000, the average annual GDP growth rate has been over 4.5%. However, the growth in the economy has largely been without job creation, and the wealth generated has not been automatically distributed evenly across the South African society. In fact, South Africa has one of the highest income inequalities with a Gini coefficient that has remained at 0.68, showing little overall change since 1994 (see Figure 2). The mid-term report reveals changes in the Theil values. These indicate an increase in the inequality within each race group, and a decline in the average wealth differences between race groups. In recent years, the relationship between inequalities and poor health has become a focal area of investigation. Not only is poor health strongly associated with low socio-economic position, but there is growing evidence that inequalities play a role in poor health outcomes.

The government has made extensive efforts to alleviate poverty involving social assistance and grants, employment generating programmes, such as the expanded public works programme, extending basic household security, social services such as adoption and child protection, disaster relief for short-term crisis situations, and employment related social insurance. In a review of these programmes, Friedman and Bhengu conclude that poverty rates were rising during the 1990s and have probably declined since the early 2000s, albeit modestly. They consider the decline to have occurred for a variety of reasons, including the large increase in social spending during the same period, especially through the payment of the Child Support Grant.


Figure 1: Schematic showing spheres of influence on health


Figure 2: Wealth Inequalities: Gini coefficient and Theil Index, 1993-2006

Culture

South Africa is a multicultural society with a multitude of traditions and customs affecting the way we live, the way we relate to each other and the way we bring up children. There are extensive ethnic differences, urban-rural differences, class differences, age group differences and gender differences, to name but a few. However, cultural trends are extremely difficult to assess as these complex social characteristics are much more difficult to measure than, for example, socio-economic characteristics. In addition, health related behaviours are sometimes portrayed as cultural in order to mask their political-economic origins.

The macro-social review has highlighted how South African society’s value systems reflect a tension between market-based competitive relations and the desire for more equitable development. Cultural trends of particular concern include the culture of violence and conflict resolution. Much more research is needed to understand the drivers of these cultures and how to build a society with more positive human interaction. The shocking outbreak of xenophobic attacks experienced during 2008, revealed a disturbing dehumanisation in sectors of society, and highlighted the complexities of social relations that play out in the context of frustrations around lack of basic services and high unemployment.

South African society is strongly gendered. While both sexes achieved similar education levels, fewer women are employed than men and of those who are employed, wages are on average lower. The constitution provides a framework for ensuring the rights of women and the Employment Equity Act (Act 55 of 1998) also fosters employment of women. These are likely having an effect, but there is little data able to capture the trends. Inability to challenge traditional gender roles, together with the culture of violence and poor conflict resolution skills, results in very high levels of intimate partner violence. Subordination and lower social ranking based on gender is also related to depression.

Environment

Environmental health hazards can be divided into the traditional concerns such as access to shelter, clean water and sanitation on the one hand, and modern health hazards, such as industrial pollutants or climate change on the other. Modern health hazards will be considered in this section, while trends in the traditional environmental factors will be considered in the next section as part of living conditions.

Local Agenda 21, the international programme for sustainable development, adopted during the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992, has called for improved environmental information for decision making. In 1999 the first State of the Environment Report for South Africa was prepared. This has initiated the preparation of provincial and local level reports and preparations are now underway for the 2005 report.

Such reports have an important role to play. For example, the Northern Cape has recently released such a report giving an overview of the state of the environment. This has highlighted, that although there are no longer any operational asbestos mines in the Northern Cape, environmental exposure is still a concern as the fibres from unrehabilitated mine dumps can become airborne and may be inhaled by humans. They report that only 42% of the asbestos mines in the Northern Cape have been rehabilitated at a cost of more than R50 million. They also report that no monitoring is currently being undertaken and that there is a lack of data on the prevalence of asbestosis and mesothelioma. While the reports aim to allow improved decision making, a workshop held in 2003 identified a range of challenges including the lack of a regulatory framework, funding, indicators and data.

An assessment of the health impact of urban air pollution in South Africa identified it as an under-recognised public problem, being implicated in 4 000 to 5 000 deaths a year through cardiorespiratory disease, cancers and respiratory infections. Fossil fuel combustion and traffic-related air pollution are the key concerns in South Africa. The National Environment Management: Air Quality Act (Act 39 of 2004), which became effective in September 2005, has provided improved regulation which needs to be fully implemented. This requires that a National Framework be established and that standards are set. Legislation is particularly important. This is illustrated by the decrease in ambient lead concentrations over the past few years, which can be attributed to the legislative requirement to decrease lead concentrations in petrol to 0.4 g/L in 1991. Although lead reduction programmes have been initiated in South Africa, the programmes have not yet been fully implemented and Norman et al. demonstrate that this environmental risk had a significant impact on health in 2000.

South Africa is a disproportionately large producer of carbon emissions with much of its relatively cheap electricity produced by coal-fired power stations. South Africa is sensitive to climate change, and contributed about 1.2% to global warming in 1990. Under the Kyoto Agreement, for the period 2008-12, as a developing country, South Africa does not have any obligation to reduce carbon emissions.

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*a Lead concentration is measured in grams per litre (g/L).*
However, government has started to consider the legislation required to mitigate the negative effects of climate change.

Macro-economic policy reforms towards promoting growth, employment, equity, trade and reducing inflation, must be carefully planned to ensure that they do not also encourage environmentally unsustainable practices. Such planning involves full cost accounting (e.g. by removing distortions from the economy, such as energy subsidisation), taxing pollution and waste generation, managing interest rates so that harmful land-use practices are discouraged, and providing alternatives to informal sector activities, which use environmental resources unsustainably.

**Living and working conditions**

Statistics show that living conditions have improved in South Africa since democracy, albeit slowly. Table 1 indicates that the proportion of households of a formal type has grown, while the proportion of informal houses and traditional houses has declined. There have also been clear improvements in access to water and sanitation, services that are essential for good health. The proportion of households with no toilet facilities has declined from 13.6% in 2001 to 8% in 2007. Figure 3 shows access to piped water by province and the change over the last five years. It highlights the variations in living conditions between provinces with the Eastern Cape, KwaZulu-Natal and Limpopo having the lowest access to services.

Access to electricity has grown rapidly improving the quality of life in many households (see Table 1).

**Table 1: Trends in living conditions: housing, water, sanitation and electricity, 1996, 2001 and 2007**

<table>
<thead>
<tr>
<th>Living conditions</th>
<th>1996 Community Survey (%)</th>
<th>2001 Community Survey (%)</th>
<th>2007 Community Survey (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Housing type</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formal</td>
<td>64.4</td>
<td>68.5</td>
<td>70.5</td>
</tr>
<tr>
<td>Traditional</td>
<td>18.2</td>
<td>14.8</td>
<td>16.4</td>
</tr>
<tr>
<td>Informal</td>
<td>16.0</td>
<td>16.4</td>
<td>14.5</td>
</tr>
<tr>
<td><strong>Water</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piped water</td>
<td>81.2</td>
<td>84.5</td>
<td>88.6</td>
</tr>
<tr>
<td><strong>Toilet</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flush</td>
<td>*50.5</td>
<td>51.9</td>
<td>57.9</td>
</tr>
<tr>
<td>None</td>
<td>12.4</td>
<td>13.6</td>
<td>8.2</td>
</tr>
<tr>
<td><strong>Source of energy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electricity</td>
<td>57.6</td>
<td>69.7</td>
<td>80.0</td>
</tr>
</tbody>
</table>

**Food security and hunger**

Exposure to indoor air pollution is an important health hazard that is reduced by such developments. In 2000, an estimated 20% of South African households were exposed to indoor smoke from solid fuels, resulting in a considerable burden of disease. Almost 99% of this burden occurred in the African population living in rural and peri-urban areas.

**Table 1:** Trends in living conditions: housing, water, sanitation and electricity, 1996, 2001 and 2007

**Note:** * includes chemical toilet

Source: Statistics South Africa 1996;25 and 2007.26

Source: Statistics South Africa, 2007.26

**Figure 3: Percentage of households that have access to piped water and no toilet facility by province, 2001 and 2007**

**Source:** Statistics South Africa, 2007.26

Food security is an important dimension of our living conditions that has a profound impact on health. Food security incorporates several aspects: food availability; individual access to food; utilisation of food; and stability of food availability. Under-nourishment is a key impact indicator of food security and is defined as having an energy consumption that is continuously below a minimum dietary energy requirement for maintaining a healthy life and carrying out light physical activity. Methods and systems for the reliable measurement of the extent of under-nourishment in South Africa as well as experiencing hunger still need to be developed.
The Food and Agriculture Organization (FAO), using local data, assesses that <2.5% of the South African population are under-nourished and finds no indication of any trend.28 The General Household Surveys include simple questions about experiencing hunger. While there are concerns about the validity of such questions, the trend shows improvements since 2002 with the proportion of households reporting that they often, or always, went hungry dropping from 7% to 2.5% in 2006.29 In contrast, the 2005 National Food Consumption Survey – Fortification Baseline (NFCS-FB) measured household hunger using a series of questions, which were used to derive an index. Based on this more sensitive index, it was found that 52% of households experienced hunger and a further 28% were at risk of hunger.30

Any gains that have been achieved in reducing hunger are currently under threat and increasing food prices are high on the political agenda. These increases are considered to be connected to increasing oil prices, speculators and the role of international companies in the distribution of food. The Minister of Finance has identified two areas for public policy response: income support to the most vulnerable; and efforts to increase production.31 He argues that government could increase the coverage of school feeding schemes and increase support to soup kitchens and similar feeding schemes.

The height and weight of children are clearly important indicators of longer-term food security. The 2003 SADHS measured children under-5 years of age and found that 12% were underweight, but a much higher proportion of children were stunted (27%).32 The NFCS-FB found that the proportion of children one to nine years of age who were underweight had reduced to 9% in 2005, compared with 10% in 1999.30 However, the prevalence of stunting decreased from 22% in 1999 to 18% in 2005. While the prevalence has not changed in urban areas, the prevalence had dropped in rural areas from 27% to 20%. Malnutrition still features as both direct and indirect causes of mortality. It has been estimated that being underweight accounted for 12% of childhood deaths in 2000.33

Exclusive breastfeeding has been shown to have an important role in reducing child mortality. Although the large majority of South African babies are breastfed for at least some period (82%), only a small proportion of babies are exclusively breastfed to the age of six months (8%).31 Developing clear guidelines around breastfeeding in the context of HIV, and its transmission through breast milk has been challenging. The Department of Health (DoH) has recently issued a clear feeding policy for infants and young children, and has recommended exclusive breastfeeding for the first six months followed by sustained breastfeeding for two years or longer.34 HIV-infected women should receive counselling on the infant feeding options to enable them to make an informed decision. Mixed feeding has been shown to be the worst option. Exclusive breastfeeding should be recommended to HIV-positive women unless replacement feeding is acceptable, feasible, affordable, sustainable and safe. It is important for these guidelines to be disseminated among health workers and that a social marketing campaign be introduced so as to encourage more extensive breastfeeding.

Micronutrient intakes are sub-optimal for many South Africans.35 The introduction of food fortification in 2003 can be expected to go some way to address some of the deficiencies, however, other approaches are also required. National guidelines recommend that all mothers should be taking iron and folic acid supplementation during pregnancy, and vitamin A shortly after giving birth. A national programme of vitamin A supplementation aimed at children six months to five years was introduced in 2002. However, the 2003 SADHS indicated that less than 40% of children received the supplementation and only 34% of mother’s received a dose of vitamin A.32 The survey also suggests that there is a need to improve communication to pregnant women concerning the type of supplementation they should receive. One third of the women interviewed could not identify whether they had received an iron supplement or not.

Employment status

The Commission on Social Determinants of Health has highlighted the importance of economic opportunity afforded through the labour market and the availability of work in determining living conditions.2 From Figure 4, it can be seen that unemployment levels in South Africa rose until about 2003, reaching levels of about 30% using the narrow definition (i.e. able and wanting to work and taking active job seeking steps in the four weeks prior to survey) and well over 40% using the broad definition (i.e. eligible to work but not being employed). Unemployment is particularly high among the young, the unskilled and Africans (see Figure 5). An economic review of human resources in South Africa describes that there is a current skills shortage in the economy and that concurrently, unemployment among the unskilled is high.36 Informal work provides little respite. Aside from income, unemployment has health consequences resulting from psycho-social factors, and high risk behaviours related to unemployment such as binge drinking and substance abuse.
Determinants of Health and their Trends

Working conditions

The lack of good data on the working environment means that it is difficult to assess whether issues in this area are improving or not. South Africa has legislation to protect workers from gross health hazards, but enforcement of occupational health and safety standards is poor. The number of inspectors is inadequate for the working population, making a system of proactive enforcement almost impossible.39 The Committee of Enquiry into a National Health and Safety Council in South Africa concluded in their report in 1997 that “existing legislation and administrative structures are unable to meet the challenges of technology, the expectations of employees, the requirements for enhanced productivity and competitiveness and the obligations of the state. Failure to do so will result in occupational accidents and work-related ill-health continuing to take an immense toll on human and economic resources”.40 According to Adams et al. there has been little progress towards harmonisation of legislation to date, and these authors point out that litigation will likely increase.39 In contrast to the improvements in mining fatalities and injuries, Adams et al. review of data suggest that working conditions have deteriorated. For example, the toll of ‘miner’s phthisis’ (i.e. silicosis and tuberculosis) continues to exist or is even worsening.

Social and community influences

Education

Education plays a fundamental role in health. Less than a third of the adult population has a matric or higher qualification. In 2007, 10% of the population aged 20 years and above had no education compared with 19% in 1996 (see Figure 6). This trend is probably a consequence of changes in access to the education system since 1994. According to the 2003 SADHS, about 95% of the younger adult population of South Africa is able to read, however, the proportion decreased with age.32

Early childhood development

In a series of articles in the Lancet, the International Child Development Steering Group outline the role that poor environments have on children not being able to reach their developmental potential.41,42 Both nutritional deficiencies and psycho-social deprivation affect brain development resulting in large numbers of children in developing countries being affected. The articles highlight the contribution that this plays in the intergenerational transmission of poverty and how it could affect the overall development of a country. The group reviewed interventions and concluded that successful programmes must provide direct learning experiences to children and families and be of longer duration, high quality and high intensity.43 Such support needs to be integrated with family support and connected to health, nutrition and educational systems and services.

In terms of nutritional deficiencies, poor development has been associated with stunting, iodine deficiency and iron deficiency anemia. In South Africa, about one in five children are stunted, and iron deficiency anaemia is a recognised health problem that needs attention.29,44 The DoH planned for an Integrated Nutrition Programme (INP) that was comprehensive and community-based, nevertheless, the programme was never fully implemented.45 The school feeding programme, however, has been more successful and by 2006/07 the programme reached about six million learners in 18 039 schools with a midday meal.15
A recent review by Biersteker and Dawes shows that early childhood development is on the policy agenda but that access to services is skewed by age, geography and race. Previous neglect in providing services for early childhood development and practitioner training has resulted in the most disadvantaged communities having access to the poorest services. While progress has been made with the introduction of Grade R classes, it is not clear what is being done from birth to four years of age.

**Social cohesion**

The importance of social cohesion is increasingly being recognised. Using data from the World Values Surveys, the mid-term report indicates that South Africa compares favourably with other comparable countries in terms of belonging to volunteer organisations, with about half the population belonging to churches or religious organisations.

A review of social determinants of health by Rispel et al. observed that the South African discourse on health determinants focuses on poverty, marginalisation and disadvantage. The review explored marginalisation, which results from social exclusion for a variety of characteristics. They pointed out that disease itself can result in exclusion, and illustrated it with cases of people with HIV or AIDS who have been excluded by their own family.

The mid-term report noted that according to survey data, Africans seem the least networked, when compared to other population groups. The report highlights the fact that although it is often assumed that Africans have a better sense of community, they belong to networks of meagre resources.

According to the review of macro-social trends, crime can be considered both a cause and an effect of social cohesion. While official crime statistics may under-report the true extent of crime, they reflect interesting trends since 1994. From Figure 7 it can be seen that murder rates have declined since 1994. In contrast, robbery rates increased for the first eight years and only started to decline in 2002/03, and rape rates have remained more or less constant throughout the period. Figure 7 also shows provincial variations for the latest statistics. Limpopo is consistently lower than the other provinces in terms of these crimes. The Western Cape and Gauteng have the highest robbery rates while the Western Cape, Eastern Cape and KwaZulu-Natal have the highest murder rates.

![Figure 6: Highest level of education amongst population aged 20 years and above, 1996, 2001 and 2007](image-url)
Figure 7: Annual murder, robbery and rape rates per 100 000 population and per province, 1994-2008

Note: * Data not available due to change in legislation and case definition

Source: South African Police Service, 2008.43
Urbanisation and migration

In spite of efforts to control the movement of people during the apartheid era and restrict Africans to selected rural areas, by 1994 more than half of the population was urbanised. Continued growth of the urban population has placed extensive pressure on the need for housing and services and has created enormous challenges for local and provincial government. Migration has been bound up with urbanisation and the splitting of families has been a part of the South African way of life. For example, children have been left in the care of rural grandparents while the parents seek employment in urban areas. This is not conducive to building the social supports needed for raising children in a secure environment. It is also clear that migration must have contributed to the rapid spread of HIV in South Africa. Legislation restricting movement has been removed but the economic drivers remain. Job opportunities are greater in the urban areas but there are still family ties to a home in the rural area.

Individual lifestyle factors

The comparative risk assessment for South Africa quantified the burden of disease, which was attributed to 17 selected risk factors that were considered modifiable. The three leading risk factors were unsafe sex, interpersonal violence and alcohol use, each accounting for significant burden of disease. The social behaviours underlying these risk factors, as well as instilling values on life, need to be addressed. The comparative risk assessment also identified a cluster of lifestyles and risk factors that result in considerable chronic disease burden, including cardiovascular and respiratory diseases as well as cancers. These include tobacco use, lack of physical activity and the inability to balance dietary intake and energy expenditure so as to maintain a healthy weight. Table 2 shows the prevalence of individual behaviours and risk factors based on data collected in the 1998 and 2003 SADHS.

Trends in health status

The availability of population health statistics has improved considerably since 1994, but the quality and scope of such statistics still needs attention and leaves a degree of uncertainty on the exact levels and rates of disease and mortality. For example, it is estimated that adult death registration has improved from about 50% coverage to more than 85%. However, the quality of cause of death certification needs to be improved if we are to get reliable information on the underlying causes. Similarly, several national household surveys have been mounted to provide

<table>
<thead>
<tr>
<th>Individual behaviours</th>
<th>1998</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td>Sexual activity: % of men 15-59 and women 15-49 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Had higher-risk sex in last 12 months</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Condom use: % of sexually active men and women</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condom use at last higher-risk sex</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Victim of violence: % of adults 15+ years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>At least one physical attack in past 12 months</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Abstinence of alcohol intake: % of adults 15+ years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never consumed alcohol</td>
<td>42</td>
<td>74</td>
</tr>
<tr>
<td>Smoking prevalence: % of adults 15+ years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Currently smoking</td>
<td>42</td>
<td>11</td>
</tr>
<tr>
<td>Overweight and obesity: % of adults 15+ years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overweight</td>
<td>20</td>
<td>27</td>
</tr>
<tr>
<td>Obesity</td>
<td>7</td>
<td>29</td>
</tr>
<tr>
<td>Physical inactivity: % of adults 15+years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insufficiently active</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Department of Health, 2002; and 2007.
crucial information about health and health programmes, but the quality and dissemination of the results of such surveys needs to be enhanced.

There are insufficient quality data to track the changes in health status since 1994, however, death statistics have reflected the rapid change experienced in South Africa. The number of deaths by age and sex reported by StatsSA are presented in Figure 8. These show a relentless increase in the young adult and child deaths during the period 1997-2005. The increase in young adult deaths is particularly pronounced in young women with the numbers in the 30-34 year age group being four times higher in 2005 than in 1997.

**Figure 8: Trend in number of death notifications, 1997-2005**

Source: Author’s calculations from Statistics South Africa data.
Further analysis of the reported deaths shows a change in the profile of causes over this period (see Figure 9). Injuries have declined from 17% of total deaths in 1997 to 9% in 2005 and are no longer the leading category of death. However, the actual number of injury deaths has remained fairly constant from year to year, indicating that the drop in proportion is related to an increase in the natural causes rather than a drop in injuries. Infectious diseases, particularly tuberculosis (TB), increased the proportion of the deaths due to infectious and parasitic causes from 13.1% to 25.5%, and pneumonia has increased the proportion of deaths due to respiratory diseases from 4.8% to 8.7%. Despite the fact that HIV was certified as the underlying cause for only about 2% of the deaths across the period, given the distinct age and cause pattern of the increase, it is clear that the major increase has resulted from AIDS. Similar trends have been observed in the two rural health and demographic surveillance sites, one in KwaZulu-Natal, the other on the border of Limpopo and Mpumalanga.55,56

Discerning the actual trends in death rates by cause from the StatsSA data alone is difficult, as both the under-registration of deaths and the mis-classification need to be taken into account. However, it is clear that life expectancy has dropped and detailed analysis of the available data together with appropriate disease models, paints a picture of a ‘quadruple burden of disease’. This arises from diseases associated with under-development such as diarrhoea and malnutrition (Type I causes) as well as chronic diseases such as diabetes and stroke (Type II causes). The coexistence of these profiles is often found in middle income countries, but in the case of South Africa, the disease profile is compounded by a high injury burden (Type III causes) and the HIV and AIDS epidemic.57-59 Burden of disease estimates, for the year 2000, have made adjustments for the data inadequacies and indicate that the health of South Africans is poor.60 Comprehensive estimates of the health loss due to disability and premature mortality have been estimated for 2000 using disability adjusted life years (DALYs).61 HIV and AIDS and TB as well as interpersonal violence and road traffic accidents are the four leading causes of health loss. The inclusion of non-fatal outcomes in the measurement of the burden results in mental health problems, such as unipolar depression and alcohol dependence, and in disabilities, such as adult-onset hearing loss and cataract-related blindness featuring among the leading single causes of health loss. While the National Burden of Disease Study highlights the need for the provision of a wide range of health services, it brings into sharp focus the need to promote health and prevent disease.

Figure 9: Trend in proportions of leading categories of causes of death, 1997-2005

![Figure 9: Trend in proportions of leading categories of causes of death, 1997-2005](image)

Source: Author’s calculations from Statistics South Africa data.

b Disability adjusted life years (DALYs) are calculated by adding the years of life lost due to premature mortality with the number of years of life lived with disability or illness, weighted according to the severity.
Considerable analysis of the newly available mortality data is underway in preparation of a National Burden of Disease Study for 2005. The ASSA2003 model (default options) for a preliminary projection of the overall number of deaths suggests that there was an increase from 530 000 deaths in 2000 to 730 000 in 2005. The ASSA2003 model is a spreadsheet simulation model of the demographic impact of the heterosexual HIV and AIDS pandemic in South Africa. The model has been calibrated to various relevant data sources. The default scenario allows for realistic trends in five HIV and AIDS interventions: social marketing; improved treatment for sexually transmitted diseases; voluntary counselling and testing; prevention of mother-to-child transmission; and antiretroviral treatment. The model is available at http://www.actuarialsociety.org.za/

In the same period, the model projects that AIDS deaths increased from 130 000 to 340 000. Crude estimates for the other causes were derived using the cause of death profile for the broad groups based on the StatsSA death data, after adjusting for the misclassification of AIDS deaths. The numbers based on this profile and the ASSA2003 model are shown in Figure 10. These estimates indicate that the period has been dominated by the profound increase in AIDS deaths. Changes in the other groups are completely masked. The increase in the number of deaths due to diabetes, cardiovascular disease and cancers, for example, are very much smaller. Initial estimates of national mortality rates, as well as data from a demographic surveillance site, suggest real increases in the rates of these conditions in the younger adult ages.

Further analysis of these data are needed to clarify the trends for single causes of death.

Figure 10: Trend in estimated number of deaths by broad cause group, 2000 and 2005

![Graph showing trend in estimated number of deaths by broad cause group, 2000 and 2005](https://example.com/graph10.png)

The uncertainty around the current levels of child mortality, a key indicator of health status, remains a challenge. Data do, however, show that by the early 1990s the previous decline in child mortality rates had reversed. Model estimates of the under-5 mortality rate are shown in Figure 11 against the Millennium Development Goals (MDGs) target. These indicate that South Africa is not on track to meet the MDGs related to child mortality. In order to meet the target to reduce the under-5 mortality rate to about 20 per 1 000 by 2015, the under-5 mortality rate should be at a level of about 31 per 1 000 in the year 2005. The observed upward trend in under-5 mortality largely matches the unfolding of the HIV and AIDS epidemic without an effective prevention programme, and by 2000 it was estimated that more than a third of deaths of children under 5 years were due to AIDS. Approximately a third of the deaths were due to neonatal causes while the remaining third were due to childhood infections, injuries and other conditions. The health facility based audits of perinatal and child mortality report many gaps in the quality of health care indicating scope to improve.

Inequalities in health status

It is striking how little South African data or analyses are available on the variations in health status by levels of wealth. Although it is not possible to fully describe inequalities in health status in South Africa, some illustrative examples can be used to highlight the variations in health status between areas, by population group and by wealth. Table 3 shows differences in the under-5 mortality rate between the highest and lowest categories using the 1998 SADHS.

Table 3: Under-5 mortality rate (per 1 000 live birth) and ratios by selected characteristics, 1998

<table>
<thead>
<tr>
<th>Population group</th>
<th>2000</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>African</td>
<td>63.6</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>15.3</td>
<td></td>
</tr>
<tr>
<td>African-white ratio</td>
<td>4.1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Residence</th>
<th>2000</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>71.2</td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>43.2</td>
<td></td>
</tr>
<tr>
<td>Urban-rural ratio</td>
<td>1.6</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mother's education</th>
<th>2000</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>83.8</td>
<td></td>
</tr>
<tr>
<td>Post-matric</td>
<td>29.3</td>
<td></td>
</tr>
<tr>
<td>Highest-lowest ratio</td>
<td>2.9</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wealth quintile</th>
<th>2000</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest</td>
<td>87.4</td>
<td></td>
</tr>
<tr>
<td>Highest</td>
<td>21.9</td>
<td></td>
</tr>
<tr>
<td>Highest-lowest ratio</td>
<td>1.8</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Province</th>
<th>2000</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Cape</td>
<td>80.5</td>
<td></td>
</tr>
<tr>
<td>Western Cape</td>
<td>39.0</td>
<td></td>
</tr>
<tr>
<td>EC-WC ratio</td>
<td>2.1</td>
<td></td>
</tr>
</tbody>
</table>

Insight into provincial variations can be obtained from the provincial estimates of mortality, which were derived for the year 2000 as part of the National Burden of Disease Study. Age-standardised mortality rates per 100,000 population shows that the Western Cape and Northern Cape have relatively lower mortality, while KwaZulu-Natal and Mpumalanga have much higher mortality (Figure 12). The geographic variations are strongly influenced by the variations in the prevalence of HIV by province. The pre-transitional Type I causes of death were more pronounced in the poorer and more rural provinces. In contrast, the overall level of non-communicable disease mortality was similar across all provinces, but the causes differed. For example, ischaemic heart disease and lung cancer had high death rates in the more developed province of Western Cape, while hypertensive heart disease and inflammatory heart disease had high rates in Limpopo. A recent analysis of the 1996 cause of death data has illustrated that non-communicable diseases significantly contribute to the mortality experienced in the poor magisterial areas of South Africa.

Figure 11: Estimates of trend in the under-5 mortality rate for South Africa, 1980-2005

Figure 12: Provincial estimates of age-standardised death rates per 100,000 population by broad cause group, 2000
The inequalities in health status seen between the provinces can also be seen at a local level. The City of Cape Town has established a mortality surveillance system that allows the causes of death to be tracked at sub-district level (Figure 13). The data for 2006 demonstrates a two-fold variation between sub-districts and highlights the differences between township areas of the city and the middle class suburbs. This shows that even though the Western Cape is the province with the lowest mortality rates, the Khayelitsha sub-district has mortality rates that are comparable to the worst provinces in 2000.

Figure 13: Age-standardised death rates per 100 000 population by broad cause group for the sub-districts of Cape Town, 2006

Source: Groenewald et al., 2008.

Conclusion

Despite uncertainty about the exact levels of mortality and the causes, it is clear that the health of the South African population has worsened. South Africa can be considered to have a quadruple burden of disease including, diseases and conditions related to poverty and under-development, chronic diseases, injuries and HIV and AIDS. Over the past 15 years, the spread of HIV has been extremely rapid and the impact of AIDS on health and premature mortality has been extensive. Inequalities in health status have not been well documented, but nonetheless differentials have been observed between population groups, wealth groups, urban-rural and education levels. Small area statistics are largely missing, but where available indicate large mortality differentials.

This brief overview of trends in the broad determinants of health indicates that national economic and social policies have resulted in economic growth, and some improvement in living conditions, through access to basic services such as water, sanitation and electricity. Despite increased provision of social grants, the extreme wealth inequalities and high levels of unemployment probably play an important role in the poor health outcomes. Management of the environment needs more attention, including the identification of alternative informal sector activities that are more environmentally sustainable. Cultural and macro-social trends are difficult to capture and quantify, but of obvious concern to health are the culture of violence and the lower social status afforded to women. While high levels...
of school attendance have largely been maintained, there is little information about the quality of education and there is much scope for efforts to enhance early childhood development.

The theoretical understanding of health and its determinants is by no means well formed, and would be a fruitful area of research that might reveal ‘inflection points’ where public health practitioners could best intervene. The Commission on Social Determinants of Health argues that there is enough evidence for governments to take action. It has highlighted three principles of action. The first principle is to improve the conditions of daily life (i.e. the circumstances in which people are born, grow, live, work, and age). While some progress has been made in certain domains, it is essential that actions are taken by the South African government and society to build social cohesion. The second principle is to tackle the inequitable distribution of power, money, and resources, the structural drivers of those conditions of daily life. Local efforts need to be linked to national and global efforts. The review by Friedman and Bhengu has identified the need to intensify anti-poverty efforts and the need for an overarching poverty policy to underpin and guarantee the human rights of the poor. The structure of the economy, and establishing robust methods of social insurance, would be important longer-term goals to maintain a redistributive element of the economy and ensure sustainability. The third principle of action is to measure the problem, evaluate action, expand the knowledge base, develop a workforce that is trained in the social determinants of health, and raise public awareness about the social determinants of health. In South Africa, the efforts to continue improving the health information system and population health data must continue, as it is essential to be able to monitor progress and inequities. Institutional capacity to collect, analyse and utilise health data at national, provincial and local levels needs to be strengthened, so that programmes and policies can be responsive to the changing burden of disease profile. Public health observatories appear to be particularly useful for making a wide range of information to the many stakeholders and have an important role for provinces and districts. There is also a need for research to better understand the determinants of population health and the effectiveness of interventions.

The Alma Ata Declaration continues to remain an aspirational charter as highlighted by a recent Lancet series revitalising Alma Ata. Not only is there a need for PHC services that provide both curative and preventive care comprising evidence-based integrated packages, there is a need for intersectoral action linking health and development, including that for better water, sanitation, nutrition, food security and HIV control. It is essential to build a wide understanding that health requires a multisectoral approach.
References


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