

# South Africa's Burden of Disease

*Evaluating South Africa's burden of disease is important for the analysis of the proposed NHI, since it will impact on resource allocation, demand forecasts, specific programme needs and the like. A heavier burden of disease will demand prudent financial planning, well-planned health interventions and proper structuring of the entire system to cater for specific needs unique to this country. This research note presents a high level overview of South Africa's disease burden and compares the findings with other developing countries, as well as a few developed countries. South Africa's one of a kind quadruple burden of disease is highlighted, while further considering what this may signify for a national health system in this country.*

## 1. Measuring the Burden of Disease

A country's burden of disease refers to the assessment of mortality, morbidity, injuries, disabilities and other risk factors specific to that country. Quantifying the disease burden in a way that is internationally comparable is not an easy task. A specific method of quantification was however standardised by the seminal international study in this field, the Global Burden of Disease (GBD) study<sup>1</sup>

which introduced a new metric for measuring the burden of disease in an area – it is called disability-adjusted life-years (DALYs). The DALY<sup>2</sup> is an incidence-based measure quantifying the health gap between a population's actual health status and a specified norm. "It measures the future stream of healthy years of life lost due to each incident case of disease or injury" by adding together "years of life lost (YLLs) due to premature mortality, and years of life lived with disability (YLDs) weighted according to the severity of the disability."<sup>3</sup>

With the lack of reliable data in South Africa, it was initially thought that calculating DALYs for South Africa would not be possible. However, as the need for such an estimate became crucial in terms of targeting health interventions and specifically measuring the burden of HIV/AIDS on South Africa, the gaps and inconsistencies in the underlying data simply had to be overcome. A first attempt at estimating DALYs for South Africa was published in 2003. The "Initial Burden of Disease Estimates for South Africa"<sup>4</sup> calculated DALYs

1. Murray, C.J. & Lopez, A.D., 1996. "The Global Burden of Disease: a Comprehensive Assessment of Mortality and Disability from Diseases, Injuries and Risk Factors in 1990 and Projected to 2020." Vol.1, *Global Burden of Diseases and Injury Series*. Boston: Harvard School of Public Health.
2. The DALY figures used in the rest of this note are all age-standardised and time discounted. For specific details on how this is done, see the SA NBD study referenced in footnote 3 below.
3. Bradshaw, D., Groenewald, P., Laubscher, R., Nannan, N., Nojilana, B., Norman, R., Pieterse, D. & Schneider, M., 2003. "Initial Burden of Disease Estimates for South Africa, 2000." Cape Town: South African Medical Research Council.
4. See footnote 3.

This research note forms part of a series of special National Health Insurance (NHI) notes which can be accessed on the Econex website [www.econex.co.za](http://www.econex.co.za). In the interest of constructively contributing to the NHI debate, the Hospital Association of South Africa (HASA) has commissioned a comprehensive costing and human resource research project with Econex. HASA has given Econex and its partners at Stellenbosch University academic independence with respect to this project. The results of the project will be placed in the public domain in order to foster constructive debate.

for the year 2000. This landmark document revealed interesting facts about South Africa's burden of disease, with the main findings being confirmed by a second study revising the first estimates.<sup>5</sup>

## 2. Quadruple Disease Burden

In order to determine the extent and severity of a country's burden of disease, the initial GBD study divided the various causes of death into three broad categories. Group I includes all pre-transitional causes, i.e. communicable diseases, maternal and perinatal conditions, as well as nutritional deficiencies. These causes of death are usually highly correlated with underdevelopment and poverty. Group II includes all non-communicable diseases, while Group III represents the injuries. HIV/AIDS is of course a communicable disease and falls in Group I, but for the South African National Burden of Disease (SA NBD) study<sup>6</sup> it was decided to assess the burden of this epidemic separately (as a fourth group) because of its unusually large burden on our society.

Each country's type of disease burden is then determined in accordance to the relative percentage of deaths falling in each group. For instance, a country where most people die from diseases in

Figure 1: Estimated Deaths by Broad Group for South Africa, 2000

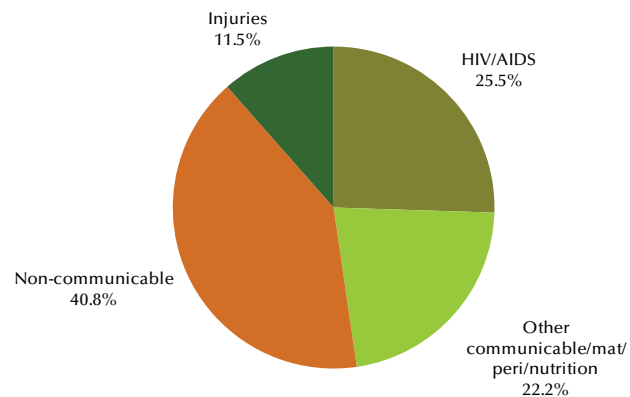
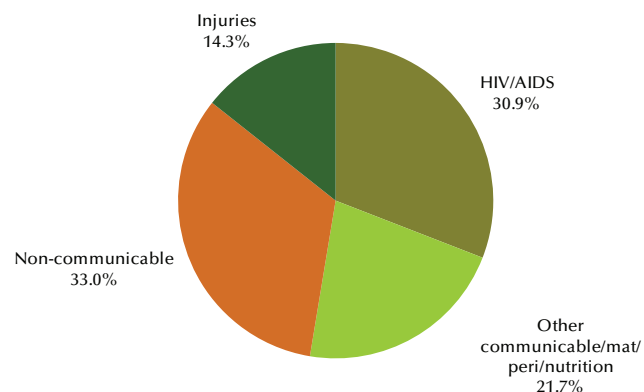


Figure 2: Estimated Disability-Adjusted Life-Years (DALYs) by Broad Group for South Africa, 2000



Group I and II, and relatively more so than from injuries in Group III, is said to have a "double" burden of disease. South Africa has a quadruple burden of disease – based on its mortality profile and DALYs' composition specifically.

The mortality profile for the South African population in 2000, according to the revised burden of disease estimates, is shown in Figure 1, while the revised DALY calculations are presented in Figure 2.

5. Norman, R., Bradshaw, D., Schneider, M., Pieterse, D. & Groenewald, P., 2006. "Revised Burden of Disease Estimates for the Comparative Risk Factor Assessment, South Africa 2000." Methodological Note. Cape Town: South African Medical Research Council.

6. See footnotes 3 and 5.

## About ECONEX

ECONEX is an economics consultancy that offers in-depth economic analysis covering competition economics, international trade, strategic analysis and regulatory work. The company was co-founded by Dr. Nicola Theron and Prof. Rachel Jafta in 2005. Both these economists have a wealth of consulting experience in the fields of competition- and trade economics. They also teach courses in competition economics and international trade at the University of Stellenbosch. Our newest director, Cobus Venter, who joined the company during 2008, is also a consultant economist at the Bureau for Economic Research (BER) in Stellenbosch. For more information on our services, as well as the economists and academic associates working at and with Econex, visit our website at [www.econex.co.za](http://www.econex.co.za).

This is quite a unique situation since the disease profile of more developed countries usually changes from one of “infectious diseases, high child mortality and malnutrition to a predominance of degenerative, chronic diseases. However, developing countries often experience a double burden, resulting from the simultaneous occurrence of these disease spectrums. In the case of South Africa, there is the added burden of injuries and HIV/AIDS.”<sup>7</sup>

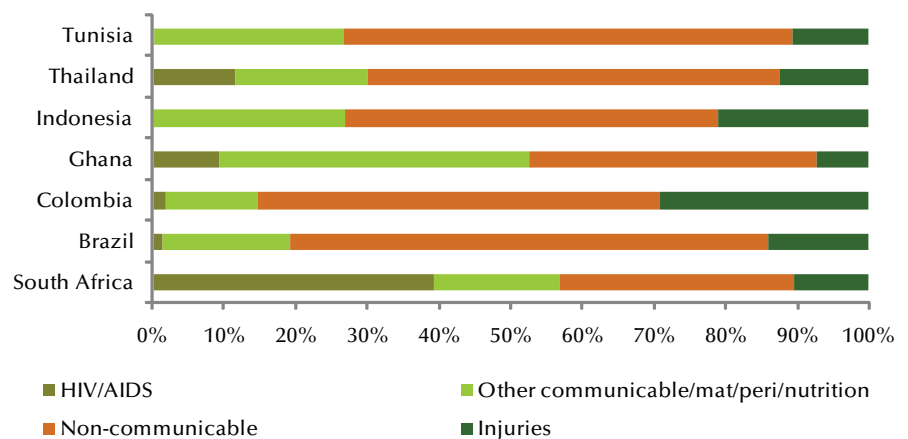
### 3. International Comparisons

In order to highlight the unique requirements of a national health insurance system in South Africa, we assess the burden of disease in other developing and developed countries.

#### 3.1 Developing Countries

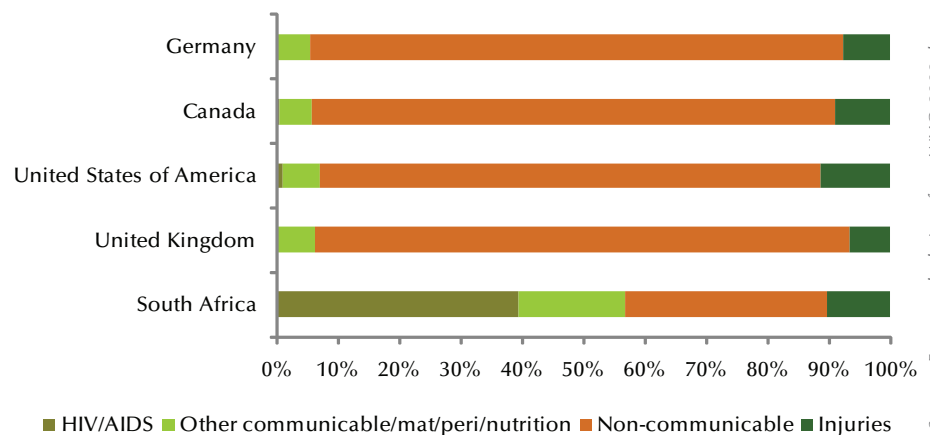
Figure 3 compares South Africa’s disease burden with that of six analogous developing countries. The graph is based on DALY figures from the World Health Organization (WHO) for each country in 2004 – the most recent year for which this type of data exists. South Africa’s quadruple burden of disease arising from the grave HIV/AIDS burden is clearly visible in that graph. One might notice that the South African numbers are somewhat different from those in Figure 2, specifically because this is for a different year and because the WHO uses the UNAIDS model (as opposed to the ASSA2002 model), as well as other data sources than the SA NBD study.

Figure 3: Disability-Adjusted Life-Years (DALYs) by Broad Group for Developing Countries, 2004



Source: Econex calculations from WHO 2009 data<sup>8</sup>

Figure 4: Disability-Adjusted Life-Years (DALYs) by Broad Group for Developed Countries, 2004



Source: Econex calculations from WHO 2009 data

What is also strikingly evident from Figure 3 is the well-known double and, in some cases, triple burden of disease which developing countries are most often plagued with. Important to remember, is the fact that HIV/AIDS is usually included with Group I and only singled out here to emphasise a point and draw attention to South Africa’s unique situation. When

the first two categories for each country in Figure 3 are then viewed together as Group I, the double burden of disease is most clearly depicted in the case of Ghana, Thailand and Tunisia. The graph shows a triple disease burden for Indonesia, and also for Colombia and Brazil, albeit to a lesser extent.

7. See footnote 5; p.1

8. World Health Organization, 2009. “Mortality and Burden of Disease Estimates for WHO Member States in 2004.” Available at: [http://www.who.int/healthinfo/global\\_burden\\_disease/estimates\\_country/en/index.html](http://www.who.int/healthinfo/global_burden_disease/estimates_country/en/index.html)

### 3.2 Developed Countries

As countries develop further, the burden of disease is known to change from one with many different facets, spread across the three groups, to a single disease burden, usually concentrated in Group II (non-communicable diseases such as cancers, cardiovascular diseases, diabetes and other chronic diseases). In Figure 4 South Africa's disease burden is compared to that of developed countries such as Germany, Canada, the USA and the UK.

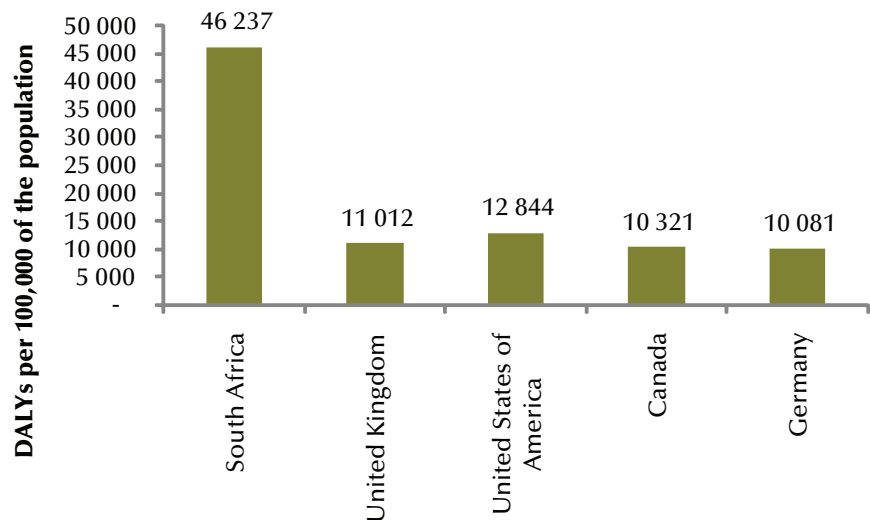
A clear picture emerges – Group II causes of death comprise between 80% and 90% of the disease burden in the developed countries examined here; with South Africa's one of a kind quadruple burden of disease once again accentuated.

### 3.3 Severity of the Burden

The severity of South Africa's disease burden can be assessed by comparing the absolute number of DALYs for the selected countries. Figures 5 and 6 present the same underlying data used in the foregoing analysis, but illustrates the gravity of the various disease burdens, rather than its composition.

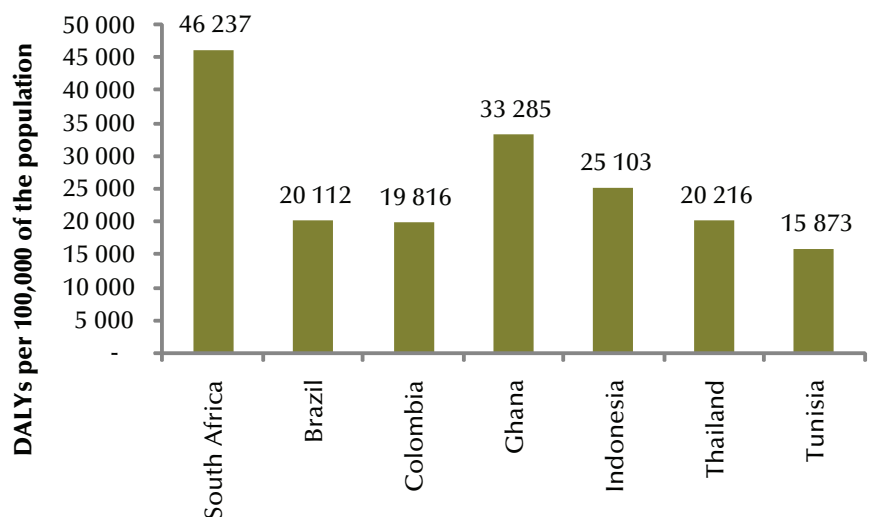
In addition to the unique composition of South Africa's burden of disease, these two graphs emphasise the fact that this country has substantially higher quantities of sick people who are also sicker than those in other countries (especially compared with the ill in developed countries).

Figure 5: Absolute Burden of Disease compared with Developed Countries, 2004



Source: Econex calculations from WHO 2009 data

Figure 6: Absolute Burden of Disease compared with Developing Countries, 2004



Source: Econex calculations from WHO 2009 data

South Africa's burden of disease is on average four times larger than that of developed countries, and in most instances almost double that of developing countries. It is reasonable then to expect

also a larger burden on finances, facilities and human resources in this country, compared to these requirements in other countries. As stated in the introduction to this note, these graphs underscore the fact

### More Information

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that much thought and careful planning is needed for the design of a national health system addressing South Africa's severe, complex burden of disease.

#### 4. Policy Implications

While the comparative analyses presented here, clearly emphasise the need for some type of national health insurance system in South Africa, it also implies that a South African NHI will have to take into account the specific quadruple burden of disease which South Africa faces. Any expectation that a national health insurance scheme, similar to e.g. the NHS of the UK or other advanced

economies' national health systems, could be introduced within a short time frame is probably overoptimistic. Specifically, the resource requirements and rationing systems of a national health insurance system in South Africa would be unique, given the specific burden of disease that was described in this note. Although the quadruple burden of disease has very distinct implications for the *supply* of healthcare, this also implies that the *demand* for healthcare looks completely different here, than elsewhere in the world. The type of in- and out-patient treatment, medication, primary and other care needed in South Africa, are not like that of other countries. One implication is, for instance, that more hospital beds, and therefore

medical as well as other staff, will be required in a country where there is such a high prevalence of HIV/AIDS, communicable diseases and also injuries. The financial and costing demands will of course then also be different from say, a country with a single burden of disease and where the severity thereof is less than a quarter of South Africa's.

It is important at this stage of the debate to understand what the demand side looks like and also what the current supply constraints are and how these can be addressed. This will foster a better understanding of the optimal design of a South African NHI. The next two research notes will deal with these issues specifically.