

# The Economic Impact of HIV/AIDS on South Africa and its Implications for Governance



## A LITERATURE REVIEW



Compiled by the Centre for AIDS Development, Research and Evaluation (Cadre) on behalf of USAID through the Joint Center for Political and Economic Studies. November 2000.

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Written by

Warren Parker, Ulrike Kistner, Stephen Gelb, Kevin Kelly and Michael O'Donovan

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## Note

This document represents a companion document to a Bibliographic Review of the titles listed. Abstracts are a combination of author developed abstracts, where these have been available, and original abstracts by the authors of this Bibliographic Review. This data is available in Acrobat format and in Microsoft Excel (excluding abstracts). It is intended that this document be updated on a regular basis. Listed authors are welcome to forward abstracts where there are none, or to suggest alternative abstracts. Suggestions for inclusion of more recent research or omissions are also welcome. The Literature Review, Bibliographic Review and spreadsheet are also available on [www.cadre.org.za](http://www.cadre.org.za) (from December 2000)

## Contact information

The Centre for AIDS Development, Research and Evaluation (Cadre) is a South African non-profit organisation with offices in Johannesburg and Grahamstown, South Africa. Comments on or additions to this report can be sent to Warren Parker at [mediaids@icon.co.za](mailto:mediaids@icon.co.za).

# CONTENTS

Introduction .....	4
Objectives of the review .....	4
Methodology of the review .....	4
Development of the bibliography .....	7
Structure of the review .....	7
Implications for governance .....	8
Limitations of this study .....	9
The macroeconomic impact .....	10
1. Broomberg et al: The human capital approach .....	12
2. ING Barings: Macroeconomic model .....	13
3. The World Bank: Computable general equilibrium (CGE) model .....	16
Some directions for future research and analysis .....	19
The demographic impact of HIV/AIDS .....	21
Demographic foundations .....	21
Behaviour change assumptions .....	25
Other demographic foci .....	25
The economic impact on sectors .....	29
Priorities for future research .....	30
Impact on firms and workplaces .....	31
Modelling methods .....	31
Research studies of impact on firms .....	32
Research needs .....	33
The economic impact on households .....	34
Economic impact .....	34
Research needs and priorities .....	36
The response of government .....	38
Emerging trends .....	38
National government .....	38
Provincial and local government .....	41
Public vs private interventions .....	43
Treatment options, cost-benefit analysis and different levels of care .....	43
Responses at regional level .....	44
Areas and issues for further research .....	45
The response of sectors, firms and workplaces .....	47
Current research .....	48
Data and data collection .....	48
Sectoral responses .....	48
Industry and business responses .....	49
Guidelines for workplace policies .....	50
Areas and issues for further research .....	51
The response of non-governmental organisations, community-based institutions and communities .....	52
Household responses .....	52
Community responses .....	53
Support and mitigation .....	54
Child and orphan care .....	57
The response of treatment and care .....	60
Cost-effectiveness: primary care and prevention strategies .....	61
Volunteer counselling and testing .....	62
HIV and other STDs .....	62
Opportunistic infections and TB .....	62
Feasibility of anti-retroviral therapy for prevention of vertical transmission .....	63
MTCT and infant feeding .....	64
Example of effective prevention strategies within a comprehensive, co-ordinated health care delivery system .....	65
Response of private health sector .....	65
Vaccine development .....	65
Behavioural and social response .....	67
Behavioural and social response .....	67
Community mobilisation and development .....	69

# INTRODUCTION

This review was commissioned by USAID through the Joint Center for Political and Economic Studies and was undertaken by the Centre for AIDS Development, Research and Evaluation (Cadre) over a period of four weeks during October and November 2000.

## Objectives of the review

- ❑ To identify completed and ongoing research conducted on the economic impact of HIV/AIDS and its impact on governance in South Africa;
- ❑ To provide a comprehensive bibliography of literature in the area;
- ❑ To make a preliminary assessment of the quality of the existing research, to identify trends and gaps in the research, to identify priority areas for research, and especially to identify the types of research which could contribute significantly to improving the response to the epidemic;
- ❑ To identify problems associated with existing research and to identify how these might be addressed in future research;
- ❑ To identify key researchers, research programmes and research resources in the area.

## Methodology of the review

### Electronic search of literature data bases

The first stage of the research process was a comprehensive review of electronic databases. The databases reviewed included:

- ❑ SA Studies, which is a metadatabase linked to Sabinet and which in turn covers SACat, the South African National Bibliography, South African citations and the Union Catalogue of Theses and Dissertations. It contains extensive coverage of South African material although it omits recently completed theses (which take a few months to be incorporated);
- ❑ Nexus, which is the database maintained by the National Research Foundation (NRF) and which includes all NRF-funded Masters and PhD dissertations, completed and in progress. It also contains reference to funded research not necessarily conducted by universities;
- ❑ ECONbase, which is an economics database accessing 64 international economics journals;
- ❑ Humanities and Social Sciences index, which covers more than 350 journals in humanities and social sciences;
- ❑ Ebsco Online and Ebscohost, which includes United States databases which cover Humanities and Social Sciences indexes;
- ❑ Academic Search Elite, which provides the full text for 1 360 journals, and indexing and abstracts for 2 920 journals.;
- ❑ Popline, which is a database attached to the National Library of Medicine in the United States and is located at the National Institutes for Health. Formally known as Population Information, it is a bibliographic database with 251 000 citations accessing both biomedicine and social sciences from 1827 to the present;

- ❑ Medline, which includes PUBMED and Grateful Med, provides citations and author abstracts from 4 000 journals published in the United States and 70 other countries;
- ❑ AIDSline, which is a dedicated AIDS data base developed and maintained by the National Inquiry Services Corporation (NISC). AIDS line covers HIV/AIDS research from 1980 to the present by accessing and citing from MEDLINE, CANCERLIT, HealthSTAR, CATLINE, AVLINE and incorporating abstracts from the international AIDS conferences;
- ❑ Databases located at the University of South Africa (UNISA) were also reviewed.

Keywords used in the search included combinations of the following terms: HIV/AIDS, HIV, AIDS, South Africa, governance, economic policy, macroeconomic, impact, expenditure, productivity, assets, distribution, growth, fiscal, labour, firm, workplace, sectoral, poverty, social capital, livelihood, welfare, inequality, employment, savings, and investment. Emerging data was cleaned to exclude inappropriate texts.

#### On-line search

A large range of on-line data bases and websites were searched for relevant articles and references. Amongst these the most useful were the publications sections of:

- ❑ UNAIDS ([www.unaids.org](http://www.unaids.org))
- ❑ World Bank ([www.worldbank.org](http://www.worldbank.org))
- ❑ International AIDS Economics Network (IAEN) ([www.iaen.org](http://www.iaen.org))
- ❑ World Health Organisation ([www.who.org](http://www.who.org))
- ❑ United Nations Development Programme (UNDP) ([www.undp.org](http://www.undp.org))
- ❑ Food and Agriculture Organisation (FAO) ([www.fao.org](http://www.fao.org))
- ❑ Centres for Disease Control (CDC) ([www.cdc.org](http://www.cdc.org))
- ❑ USAID ([www.usaid.gov](http://www.usaid.gov))
- ❑ AEGIS ([www.aegis.com](http://www.aegis.com))
- ❑ Partnerships for Health Reform ([www.phrproject.com](http://www.phrproject.com))
- ❑ Harvard AIDS Institute ([www.hsph.harvard.edu](http://www.hsph.harvard.edu))
- ❑ Family Health International ([www.fhi.org](http://www.fhi.org))
- ❑ The Futures Group ([www.tfgi.com](http://www.tfgi.com))
- ❑ SafAIDS ([www.saf aids.org](http://www.saf aids.org))
- ❑ Metropolitan Life ([www.redribbon.co.za](http://www.redribbon.co.za))
- ❑ Healthlink ([www.healthlink.org.za](http://www.healthlink.org.za))
- ❑ HEARD (Health Economics and HIV/AIDS Research Division)
- ❑ Centre for Health Policy ([www.healthlink.org.za/chp](http://www.healthlink.org.za/chp))
- ❑ Health Systems Trust ([www.hst.org.za](http://www.hst.org.za))
- ❑ Department of Social Development ([www.welfare.gov.za](http://www.welfare.gov.za))
- ❑ Children in Distress ([www.togan.co.za/cindi](http://www.togan.co.za/cindi))
- ❑ The Actuarial Society of South Africa (ASSA) ([assa.org.za/committees/aids](http://assa.org.za/committees/aids))

#### Search of conference abstracts

Titles and abstracts of conference presentations have been incorporated, including a number of recent key conferences held in South Africa. These include the 13<sup>th</sup>

International AIDS Conference and the International AIDS Economics Network Conference, both held in Durban in July 2000, the Joint Population Conference entitled 'The demographic impact of HIV/AIDS in South Africa and its provinces,' held in Port Elizabeth in October 2000, and the Epidemiological Society of Southern Africa (ESSA) Conference entitled 'Poverty and Inequality: The challenges for public health in South Africa,' held in East London. As far as possible, presentations from these conferences were accessed via conference websites, CD-ROMs, and directly from authors. It must be noted however that in some instances abstracts of presentations are included in conference programmes and proceedings without necessarily being presented.

## References and bibliographies

In addition to the above search strategies, bibliographies and reference lists of articles collected were scanned to allow for further key articles to be included.

## Access to literature

A considerable proportion of the identified literature was available in the public domain on the Internet. This included full articles, summaries and abstracts, available via the home pages of referenced journals (eg. The Lancet at [www.thelancet.com](http://www.thelancet.com); British Medical Journal at [www.bmj.com](http://www.bmj.com)), as well as through the websites listed above. Additional literature was obtained from libraries and resource centres. Articles under preparation and not otherwise available were obtained directly from authors.

## Abstracts

Abstracts, where available, have been included in the bibliographic review. Additional abstracts were developed based on readings, and many of the references listed in the bibliographic review include abstracts.

## Interviews and email correspondence with key informants

Key South African oriented authors and researchers were identified and interviewed to gain an understanding of various issues including: views on the state of research in the area; evaluation of the state of knowledge in their specific areas of expertise; priority research areas; technical or methodological gaps and problems associated with conducting research in AIDS and economics, and ways of addressing these; and identification of key resources. The interview process was, however, limited by time constraints and geographic location of potential interviewees.

Key informants included Phil Compennolle, Department of Finance; Veloshnee Govender, Health Economics Research Unit, University of Cape Town; Lindiwe Makubalo, Department of Health; Nicoli Natrass, Department of Economics, University of Cape Town; Helen Schneider, Wits University Centre for Health Policy; Ben Smit, Bureau of Economic Research, University of Stellenbosch; Malcolm Steinberg, Abt Associates; Jacques van Zuydam, National Population Unit; Andrew Whiteford, Wefa; Chris Desmond, HEARD; Jeff Gow, HEARD; Jeff Lewis, World Bank. E-mail correspondence was also conducted with Alan Whiteside, HEARD; Sydney Rosen, Boston University; Kristina Quatteck, formerly of ING Barings; and Rob Dorrington (University of Cape Town).

## Development of the bibliography

There is a considerable body of secondary literature, and it has been necessary to be selective regarding the articles through applying specific criteria. The electronic search turned up more than one thousand separate listings and this was reduced to approximately 450 articles. It is also recognised however, that a bibliography of this nature is a living process that benefits from regular updates and analysis.

The following is a summary of key inclusion and exclusion criteria which were employed:

- The review focuses on articles which specifically incorporate an economic perspective or analysis;
- The review focuses on more in-depth research reports and articles related to original research with an emphasis on contemporary literature. Literature which referred to past trends or issues which are no longer of significance were not included;
- References to completed theses have been included. However it was not possible to obtain or analyse these texts within the timeframe of the review;
- Very little South Africa specific research and analysis was identified. However, analysis was made possible through inclusion of key international and developing country texts which provided expanded understanding of the South African context;
- Articles of a commentary nature in financial weeklies and journals have been omitted.

## Structure of the review

It was decided that impact and response should be regarded as distinct areas of analysis as this approach is consistent with the general approach to economic analysis, and is echoed in the categorisation of data in a number of referenced texts. It must be noted however, that there is a blurring of the lines between impact and response aspects. Furthermore, whilst much has been written about the economic impact of the epidemic, there is a trend towards emphasising research which will be useful in studying the costs associated with specific response options (for example, the costs associated with different models of orphan care, or the costs of AIDS management) and towards generating data which will be useful in planning and implementing integrated national level social responses. This latter emphasis is key to responding to HIV/AIDS, for it is only through strategic fast-track interventions that significant gains will be made.

Many of the key informants interviewed noted that there has been relatively little work in the area of economics of response (notwithstanding limited analyses in the area of impact), and that in the context of the rapidly moving HIV/AIDS epidemic, monitoring responses and analysing interventions is an appropriate area of emphasis.

The broad classification of the literature and bibliographic reviews are as follows:

- Macroeconomic impact;
- Demographic impact;
- Sectoral impact;
- Impact on firms and workplaces;
- Household impact;
- The response of government and related institutions;
- The response of sectors, firms and workplaces;

- ❑ The response of non-governmental organisations, community-based organisations and communities;
- ❑ The economics of interventions;
- ❑ Behavioural and social response.

The analysis of each area incorporates an overview of the range of literature available with an emphasis on issues and trends relevant to South Africa. Where clear trends, guidelines and indicators exist, these have been reviewed in detail. This is followed by a review of the South Africa specific data. Commentary and perspectives derived from interviews is woven into the text.

Gaps have been identified and insights applied with regard to areas that require further research (although, given the scant availability of South African literature, further research and analysis is required in every area of this review).

A reading of the bibliographic review provides further insight into the potentials for identifying areas of research, crafting of research methodologies, as well as of trends in findings.

## Implications for governance

The macroeconomic impact of HIV/AIDS has considerable implications for governance, for it is through governance that the epidemic must be addressed and its impacts contained.

Whilst the concept of governance implies government, it is best understood broadly to incorporate a triadic relationship between government, the private sector and civil society. The UNDP define governance as 'the exercise of political, economic and administrative authority in the management of a country's affairs at all levels. Governance comprises the complex mechanisms, processes and institutions through which citizens and groups articulate their interests, mediate their differences and exercise their legal rights and obligations.'<sup>1</sup>

Viewed positively, the purpose of governance is to advance human society through facilitating a political and legal environment (government), generating employment and income (private sector), and mobilising political and social response (civil society). Obviously these foci are not clear cut, nor are they always driven from the perspective of appropriate and sustainable human development, but they do remain interrelated.

Implicit in the concept of governance is engagement with economic aspects, political and policy aspects, and administrative aspects.

With regard to HIV/AIDS, of urgent concern is the promotion and fostering of an enabling environment that will minimise the impact of the disease, whilst at the same time maximising the potentials for human development within the context of a life compromising health exigency. Research is an integral part of such an enabling environment, but the relative lack of research is of concern. It is only through research that necessary insights can be provided towards planning policy and strategic interventions – and these lie at the core of governance towards social development.

It must be noted that the fact that there is so little research, makes it difficult to develop critical and comparative analyses, and thus some research data may be built upon (and may perpetuate) insufficiently sophisticated assumptions. Thus there is an urgent need for further research, particularly research into programmes which alleviate the economic impact of HIV/AIDS. In this respect this report points to the need for fast-tracking of solution-finding and problem-solving



models of research. Areas where there is a particularly stark need for data and research have been identified. At the moment there is really very little research support to guide policy development, spending priorities and allocation of resources in different sectors and contexts. Integrated plans are needed to deal with HIV/AIDS in a wide variety of contexts and there remains little clarity as to what should be done and how much it will cost.

#### Limitations of this study

This study was produced over a period of four weeks and involved the integration of a range of multi-authored texts and individual activities. The authors recognise the necessity for processes of reflection and commentary and that these may not have sufficiently been applied to this literature review. It is also recognised that such review type activities are constrained by access to sources of literature as well as to information from key informants.

Comments and suggestions related to this review and bibliography are welcome and can be sent via e-mail to [mediaids@icon.co.za](mailto:mediaids@icon.co.za). Where appropriate, comments will be integrated into forthcoming updates and revisions.

#### Footnote

1. UNDP (2000) Governance for sustainable human development, United Nations Development Programme (UNDP), Geneva

# THE MACROECONOMIC IMPACT

## Background

Reviewing research on the economic impact of HIV/AIDS in the early 1990s, Broomberg (1993) concluded that:

*'work on the overall economic development impact of HIV/AIDS in South Africa is scanty, superficial and speculative. It is generally argued the epidemic is likely to have devastating consequences for overall economic development in South Africa, and that these consequences are likely to be felt in the first decade of the next century, as the demographic impact of the disease begins to have an effect. ... these speculative analyses [are not] accompanied by any attempt at quantification. There has thus been no effort to link the disability and mortality impact of the disease to levels of unemployment, or to the distribution of skill levels in the economy.'*  
(emphasis added)

Seven years later, it would seem that not very much has changed. Research on the economic development impact of HIV/AIDS in South Africa remains scanty. There were three useful contributions in the same 1993 volume as Broomberg's review – by Cross, by Trotter and by Broomberg himself with colleagues.<sup>1</sup> Since then, it is really only in the past year that any serious attempt to quantify the projected impact has occurred, in the shape of analyses commissioned by ING Barings (2000) and by the World Bank (Arndt and Lewis, 2000).<sup>2</sup>

Most discussion of the epidemic's impact on South African development have tended to be superficial, and not based upon analytical models or quantitative research. It is noteworthy though that the tenor has moved towards cautious optimism about the macroeconomic and growth impact from the extreme pessimism summarised by Broomberg. Whiteside and Sunter, for example, label as 'Myth: The epidemic will cause economic growth to falter and possibly even decline' (2000, 86) while the Bureau for Economic Research points out that 'the human and sociological side of the epidemic is likely to be much more serious than the economic' (2000, 20). Similarly, the private investment bank Morgan Stanley Dean Witter suggests that 'in cold GDP terms, the impact may not be as great as a look at mortality rates suggests... the economic implications of this disaster are far from clear... In the end, we suspect that fears on the economic impact [in SA] of the epidemic may have been overdone' (2000, 2,5). Somewhat surprisingly, this view is echoed by the World Bank, which argues that 'AIDS has little net macroeconomic impact... the available evidence suggests that the impact of AIDS on [economic output and growth] will generally be small relative to other factors' (*Confronting AIDS*, 1998).<sup>3</sup>

There appears to be only a single quantitative analysis which supports the cautiously optimistic view – based on a cross-country regression involving 51 countries, it suggests that:

*'there is little support for the widespread claim that the AIDS epidemic will slow the growth rate of income per capita... after controlling for standard influences on growth... we find no evidence that the economies [where HIV/AIDS is quite advanced] grew at a significantly slower pace... than those of other countries where changes in the cumulative prevalence of AIDS was lower. (Bloom & Mahal, 1995, 21)*

The authors compare the impact of AIDS on real wages and output growth with those experienced during the Black Death and the influenza epidemic in India in 1918-19. The growth equation used in this model incorporates an AIDS variable, representing the number of full-blown AIDS cases projected from levels of HIV+ prevalence. The AIDS variable, in other words, reflects only the *demographic* impact of the epidemic. This variable 'is expected to capture the effect on growth of a smaller and possibly less productive work force and of the diversion of social resources to the care of people with AIDS and to the prevention of HIV transmission' (Bloom & Mahal, 11). But it is hard to see how the demographic variable can take adequate account of *economic* impact, given cross-country differences in the distribution of the impact across skill and income classes *within* the labour force, and in the level and distribution of per-case care and prevention expenditure.

The shift in mood away from pessimism is based to a considerable extent on the growth record to date. The fact is that, although South Africa's growth over the past decade has been sluggish at best, there has not been a steep *decline* in macro performance. Nor has growth in other African economies dropped for reasons clearly identifiable with HIV/AIDS. It should be noted though that, according to Broomberg, the consensus was that the most severe impact would be felt only after the turn of the century, just where we are today. And the co-author of the cross-country analysis discussed above, recently expressed a different view about Africa, and South Africa in particular:

*'The whole economy [in Africa] could unravel... what is about to come is 10 times worse. You are going to see a tidal wave of AIDS cases in South Africa, and the health care system is going to be hit hard.'* (Bloom, cited in Wehrwein, 1999-2000)

The choice between these two stances cannot at this stage be adjudicated by recourse to quantitative projections of the economic impact of AIDS – as already pointed out, the existing body of work is too small, even when supplemented by macro analysis of other African countries.<sup>4</sup> But in addition, macro analysis is still self-admittedly speculative, in that its authors are forced to make a myriad of assumptions, about the demographic impact on the labour force, and about the (economic) behavioural response of agents, household, firms and government. The need for such assumptions is in large measure due to the absence of adequate research at the micro level to underpin macro level analysis. Despite these difficulties, closer examination of existing macro analysis is worthwhile in pointing to future research questions and issues, at all levels of analysis.

The starting point for these analyses is precisely the differences between HIV/AIDS and other high-prevalence infectious diseases, which Bloom and Mahal downplay. These differences are, firstly, that AIDS is inevitably fatal and affects people who are sexually active, and therefore also part of the active labour force. This is in contrast to diseases like malaria. Thus the AIDS epidemic affects the size, growth rate and age and skill composition of the *future* labour force, which in turn feeds into the growth rates of potential output and of productivity. Secondly, unlike other killer diseases like bubonic plague, AIDS is slow-moving, both within society and also within the human body, so that the incubation period is extended and morbidity level high. As a result, society must bear costs of treatment and palliative care which are high relative to other killer diseases. This affects the level *and* composition of future consumption demand by both private and public agents, and thus also the levels of savings and of investment. The economics of HIV/AIDS is therefore quite distinct from other diseases with similar epidemiological and/or demographic characteristics (Ainsworth & Over, 1994).

Projections of economic impact in South Africa depend on how these impacts are transformed into quantitative assumptions for economic modelling exercises, as well as the specific economic assumptions underlying the models used. Three different approaches have been applied, and are discussed in turn:

1. the early 1990s work by Broomberg and colleagues and by Trotter makes use of a 'human capital' framework;
2. the ING Barings analysis rests on the WEFA macroeconometric (time-series) model; and
3. the Arndt & Lewis contribution adapts a standard computable general equilibrium (CGE) model of South Africa. Most of the work on African and other developing countries (involving Over or Cuddington, as well as Nicholls et al) is based on elaboration of a Solow growth model, which is similarly structured to the CGE approach in important respects .

### 1. Broomberg et al: The human capital approach

This approach is based on a methodology developed by Rice, and adapted to HIV/AIDS.<sup>5</sup> It makes use of what is essentially a cost-benefit framework in that it focuses on those directly affected by the epidemic and excludes from consideration the rest of society. The impact of the epidemic is understood to comprise the total annual costs of the disease to society, cumulated over a specified period. Costs are divided into direct and indirect, where direct costs include the costs of health services provided by public and private sectors to PWAs at all stages of the disease) as well as testing, prevention research and education. Indirect costs include estimates of the morbidity, disability and premature mortality as a result of HIV/AIDS per annum, by summing lost future earnings (discounted at an appropriate social discount rate) over all cases (structured by race, age and gender). This total is adjusted downwards to account for replacement of ill and deceased workers by unemployed workers, to give a proxy for lost production in the economy as a whole. All the unskilled workers and half of the semi-skilled are assumed to be replaceable once forced to leave the labour force due to illness or death.

Broomberg et al's 1991 analysis was based on demographic input from the 'Doyle model',<sup>6</sup> which suggested at the time that prevalence in South Africa would peak at about 30% of the adult population, leading to a reduction in population growth rates by 2005. Even with behaviour changes, prevalence would still reach about 18% before levelling off. The analysis combines this input with estimates of cost of care for PWAs and of wage rates, to calculate the various components of total costs. It then attempts to provide some perspective on costs by relating them to total health care expenditures and to GDP.

Broomberg et al start with a discussion of costs per AIDS case in which they cite costs between R15 000 and R20 160 per patient per year for 1988-90.<sup>7</sup> Unfortunately, though they criticise some of the studies they cite in this regard, for 'gross overestimates' of *total* AIDS direct costs, they do not indicate whether this is because the cost per case used is too high, or the caseload. The range of R15 000-R20 000 can be compared with 'the empirical regularity' that annual AIDS treatment costs per person average 2-4 times annual per capita income (Ainsworth & Over, 1994, 217). In 1991, South Africa's per capita income was R9 171, so that twice national income – R18 342 – is just within the range of costs cited above. This suggests that the individual cost levels cited by Broomberg have some credibility, but (again) unfortunately they do not indicate whether they have used these levels in making their own, more modest, estimates of total direct costs. They provide no 'price-quantity' decomposition of total direct costs, making it

impossible to update their data for use today. This is a great pity, as estimates of direct costs are particularly important for input into other work.

They suggest that total costs of the epidemic incurred in 2000 would be between 2.3% and 4% of GDP in that year, with the *direct* costs making up the majority of this total, between 1.8% and 3.6%. In 2005, the equivalent proportions would be 5.1%-9% for total costs, and 3.8%-8% for direct costs. It is similarly argued that direct AIDS-related costs would amount to between 19 and 40% of total (public plus private) health care expenditure in 2000. These numbers are very high, indeed too high to be credible, and suggest some problems in the underlying assumptions, as well as perhaps some of the difficulties in using the human capital methodology to generate estimates of aggregate economic impact.<sup>8</sup>

The human capital approach was extended by Trotter (1993) to look at a range of other issues, including lowered returns on educational investment due to HIV/AIDS, the sensitivity of mortality costs (loss of future earnings) to alternative distributions of age and skill amongst AIDS death, and the impact of higher recruitment and training costs for replacement workers. As with the discussion of patient treatment and care costs by Broomberg et al, this work has not been carried forward in the interim, even though it addresses issues which are essential inputs into studies of macroeconomic impact as well as health policy response and financing for both public authorities and private firms.

There are two main problems with the human capital approach. The first is that it does not examine how the direct costs of the epidemic are 'financed' in the macroeconomic sense, that is whether they replace other expenditure, either consumption or investment, or add to total expenditure by reducing domestic savings or drawing on foreign savings (capital inflows). All of these may well be used in some combination, but the impact on GDP and other macroeconomic variables is likely to be quite different, depending on the precise 'financing' combination, and how the economy is understood to adjust to the change. This problem is recognised to some degree by Broomberg et al. The approach furthermore does not recognise that a proportion of lost earnings (indirect costs) would have been saved and applied to investment, so that society's future productive capacity is lower as a result of the epidemic than it otherwise would have been, and a proportion of future earnings will not be accounted for. In addition, the assessment of lost future earnings, by focusing only on those directly affected, does not account for upward wage adjustment within scarce skill categories, especially in the skilled and semi-skilled classes, as well as possible adjustment by firms to more capital-intensive techniques. The epidemic in other words is likely to result in some redistribution within the surviving labour force, and the economy as a whole, of which the model cannot take account.

As Cuddington argues, 'the human capital approach is better suited to estimating the marginal benefit of preventing a single case of HIV infection', than assessing the aggregate income and growth impact (1993a, 188). Nonetheless, it does place useful emphasis on accurate estimation of the costs of health care, an issue over which there remains considerable confusion, but which is an essential input for more strictly macroeconomic methodologies (ING Barings, 2000: 16).

## 2. ING Barings: Macroeconometric model

As noted, this approach uses the WEFA time-series based macroeconomic model, which is a widely-used commercial forecasting model. Demographic input data is based on the ASSA600 model,<sup>9</sup> which in turn originated from the 'Doyle model' used by Broomberg et al. The key results are that the growth rate of GDP declines by 0.2%-0.3% up to 2005, and thereafter by 0.3%-0.4% (Figure 1). Since

population growth declines by more than this – 1.33% – up to 2005, per capita income will actually be higher until 2005, as compared with a ‘no AIDS’ situation, if the model’s projections are accurate. After 2005, the decline in population growth averages 0.12% per annum, which is less than the decline in the growth rate of GDP, so per capita income will be lower than without the epidemic. Notwithstanding the ‘dark cloud’ image in the title, the ING Barings study gives some support to the ‘cautiously optimistic’ view discussed above; indeed, the study makes explicit that it is presenting a ‘non-alarmist’ scenario.<sup>10</sup>

A number of assumptions are made to translate epidemiological data into economically meaningful labour force impacts, and some of these are worth discussion. The point is not so much to criticise the specific positions adopted by ING Barings/WEFA, as to underline some of the inherent difficulties involved in modelling work of this nature, in which large numbers of assumptions are necessary, which in turn should be earmarked as issues for further sectoral, labour market and policy research. Firstly, labour force mortality estimates are translated into ‘efficiency units’ using average wages as weights, a common procedure but one which perhaps underestimates the productivity contribution of experienced workers in lower skill categories, and the impact of replacing such workers with younger employees.<sup>11</sup> Secondly, although there is an attempt to take account of differential cost impacts across sectors of labour losses, it is not clear that this takes account of varying skill compositions in different sectors, and particularly the potential for high-skill capacity bottlenecks in some sectors, with consequent labour cost implications.

A third questionable assumption is the fixing of morbidity losses due to the onset of full-blown AIDS in HIV+ workers at 0.33 years per worker, with surprisingly no differentiation on the basis of skill class. This is motivated on the grounds that South Africa’s health care system is more sophisticated than elsewhere in Africa, where figures of closer to 2 are used, to take account of home-care providers also having to leave work (Cuddington, 1993a:179). While a parameter value of 2 might be somewhat high, 0.33 seems extremely low, even for skilled workers.<sup>12</sup> Semi-skilled and unskilled workers are expected to comprise the majority of AIDS deaths in South Africa, and for them more expensive medical treatment and hospitalisation is unlikely.<sup>13</sup> On the other hand, if a high proportion of unskilled and semi-skilled AIDS patients come from the unemployed, then a morbidity loss factor of 0.33 years per workers might be justified. However, the study does not make this possibility explicit.

The burden of rising private medical costs is arbitrarily distributed equally between firms, employees and consumers, with no apparent regard for differential bargaining power amongst these groups in different sectors. It would be interesting to have more detailed data by sector and skill category on this issue.

In looking at the impact on household demand, the argument is very complex, apparently suggesting that the drop in household demand due to lower labour incomes is offset to a considerable degree by rising income per capita within households due to the smaller population. This leads to a *smaller* decline in demand for durable goods and non-health services than the decline in demand for non-durables, such as food, for which the proportionate demand is inversely related to income (Figures 14 and 15). Though higher demand for health services due to the epidemic is taken account of, there seems to be no other behavioural adjustment to AIDS. Household savings drop less than demand for non-durables (Figure 17). This is at odds with research elsewhere which suggests that households cut back on durable consumption to maintain food intake, and under some circumstances will *raise* the level of precautionary savings to fund investments such as housing, on the expectation of AIDS-related deaths, to support surviving

family members (Ainsworth & Over, 1994:217). In addition, the study ignores the possibility of transfers across households, which is common within rural areas, and between urban and rural areas. It ignores also access to credit, which is widely used by all income classes in South Africa to maintain consumption levels under pressure.

Turning to look at government expenditure, the study takes this to be R3 000-R4 500 per annum per AIDS patient. This can be compared with the estimates cited by Broomberg et al, discussed above, of more than R15 000 in 1991 prices, equivalent to over R30 000 in 2000 prices, or with the Ainsworth/Over 'rule of thumb' of between two and four times per capita income, which in 1999 was equivalent to R37 214.<sup>14</sup> Both of these are nearly ten times the figure cited by ING Barings as a 'conservative official estimate'. The ING Barings study notes explicitly the lack of reliable data on the question of government spending levels at the individual and aggregate level.<sup>15</sup> It is not overstating the case to suggest that without greater clarity on this point, it is hardly worth undertaking further macroeconomic analysis – if spending levels on a per case basis are in fact ten times higher than the model assumes, then clearly model outputs at the macro level are fundamentally unreliable. On the other hand, if government is in fact spending the amounts used as inputs in the model, and this is only one-tenth the level required for adequate treatment and care, then the macroeconomic impacts are at best of secondary importance to the human and social issues at stake.

Acott (2000) develops a critique of the ING Barings use of the demographic projections from the ASSA600 model.<sup>16</sup> Part of this is an attempt to replicate the ING Barings 'map' linking the ASSA600 epidemiological data for the population as a whole, to the impact on the labour force, by skill and employment status. Acott makes two points criticising the ING Barings study's process in this respect – it ignores provincial data and it assumes that the race, age and gender profile of skills groups stays constant over time, even in the face of the AIDS epidemic. He adjusts for these issues in his replication.<sup>17</sup> His results depart from those of ING Barings in three important respects: his HIV+ prevalence rate is distributed more evenly across skill classes, which the rate for highly skilled workers significantly higher, and that for unskilled significantly lower; at a sectoral level, the prevalence within the public sector is significantly lower; and finally, the time profile is different, Acott's prevalence rates peaking much earlier at about 2000, as opposed to ING Barings' peak at around 2005, Acott thus supporting the contention of Rosen and others that the epidemic is more advanced, than had been believed based on earlier results from the ASSA600 model. In consequence, AIDS-related deaths in the years after 2010 are projected to be higher than ING Barings suggests, and the differences are particularly stark in the high-skilled group. (Acott, 2000, 4.4 and 5.2) Both of these factors can be expected to contribute to a substantially more negative macroeconomic outcome, as Acott points out. The scope of this study does not allow full evaluation of the ASSA600 model, or its use by ING Barings and Acott, but the difference of view underlines the sensitivity of the macroeconomic impact to the link between the population and labour force projections.

The ING Barings study also makes a number of strictly economic assumptions, which are important to the outcome. Firstly, it is noted that public expenditure switching is difficult to handle at the model's aggregate level, so that all AIDS-related public spending is deficit-financed. However, there is no theoretical difficulty in incorporating different components of public spending into models of this sort, and this has been done in similar models used in South Africa (not least by the Treasury). Given the importance of this issue in assessing the impact of HIV/AIDS, appropriately adapted models should preferably be used.

Secondly, investment in the model appears to respond in a fairly mechanistic

manner to capacity utilisation. In the AIDS scenario, utilisation rises due not to higher economic activity (the usual reason) but due to lower productive capacity and potential output, which drop as a result of the population and labour force decline. It seems perverse that *lower* potential output should boost investment, despite the epidemic leading to lower levels of demand, and probably also a confidence decline. The investment function could be adjusted, perhaps by lowering its intercept, notwithstanding the possible shift by firms to raise capital intensity to mitigate AIDS-related labour costs. The model's parameters are based on historical data, but these need to be intelligently adjusted to take account of the context in which it is being used.

Thirdly, the government deficit increases by more than the rise in health spending, due to a downward shift on the revenue side linked to lower activity levels in the economy as a whole. Together with lowered private savings, the higher deficit results, in the model, in higher interest rates. As with the effect on investment of utilisation rates, this outcome does not seem to take account of the probable reduced demand for capital from the private sector, so that overall capital market pressure may not be as severe as the higher deficit suggests (while some expenditure-switching may limit the deficit's increase). It is not clear that interest rates in the model are tied to total demand for capital, as opposed to only public sector demand.

Thus the model suggests that while both investment and domestic savings will decline, the investment drop will be more moderate, resulting in a larger savings gap which will have to be filled by foreign capital inflows. In fact, it is quite plausible *a priori* that there will be a larger collapse of investment, resulting in a shrinking of the savings gap and a capital *outflow*, tied also to the investor confidence issue. This is not in any way a happier outcome than that suggested by the model, but it will require a different policy response. The assumptions about exports and imports are also worth reflection.

In summary, the model used is highly aggregated, and ill-suited to model expenditure switching programmes, which are probably the key to management of health care costs in the face of AIDS. A number of assumptions are made regarding the impact of the HIV/AIDS epidemic and possible behavioural responses by economic agents, which point to future research directions for AIDS analysts from all disciplines. The investment function is autonomous from savings, which distinguishes this model from the others used thus far to study HIV/AIDS in South Africa. But investment responds somewhat mechanically to the factors which drive it, and the actual level of economic activity and, crucially, of confidence seem to have limited impact. But given its demand-driven, essentially Keynesian, structure, the impact of the higher deficit spending on investment is moderated, so that it is not surprising that the overall decline in GDP growth resulting from the epidemic is very modest.

### 3. The World Bank: Computable general equilibrium (CGE) model

Unlike the macroeconometric class of models discussed above, CGE models are based on a 'snapshot' picture of an economy contained in a social accounting matrix, which is in turn an elaboration of an input-output matrix. CGE models are rich in sectoral and income distributional data as compared with the time series-based and aggregated macroeconometric models, and are widely used to evaluate trade and fiscal policies affecting taxation and expenditure, since these commonly have differential impacts on productive sectors and income classes within the economy. These models are well suited therefore to evaluate the economy-wide impacts of the HIV/AIDS epidemic, and have been surprisingly under-utilised for



this purpose, not only in South Africa but elsewhere also.<sup>18</sup> The Solow-type models which have been more commonly used in the HIV/AIDS context can be seen as an aggregated (one-sector, one-class) version of the standard neo-classical CGE used by Arndt & Lewis and Kambou et al, in that it has the same macroeconomic structure, but obviously lacks the distributional richness of the CGE.<sup>19</sup>

The key aspect of this macroeconomic structure is that these models are *supply*-constrained, as opposed to the *demand*-driven WEFA model, so that declining production and incomes (and thus savings) tend to be magnified in their depressive effect on the economy. This helps to explain why the net macroeconomic impact from this exercise is much more pessimistic than the ING Barings study. Arndt & Lewis conclude that the reduction in GDP growth as a result of HIV/AIDS will be extremely large – the difference in GDP growth between the ‘no AIDS’ and ‘AIDS’ scenarios is 0.5% in the second year of their projection (already bigger than the maximum difference estimated by ING Barings), and then continues to widen until it reaches a maximum of 2.6% by year 11. The *average* difference over their 13-year horizon is 1.6%, more than five times as large as ING Barings. The per capita income projections are similarly devastating.

Arndt & Lewis rely on many of the same epidemiological inputs and assumptions as the ING Barings study. But where they differ, they take a significantly more pessimistic view. Firstly, and most important, they introduce a decline in total factor productivity (TFP) as a result of the epidemic, over and above the loss of *labour* productivity, which increases the negative macroeconomic impact. Total factor productivity refers to efficiency improvements (or declines) which are not attributable solely to one or other of the two factor inputs (labour and capital), but rather to their combination in production. Arndt & Lewis justify the inclusion of this effect on the grounds that HIV/AIDS will reduce the productivity of management and of capital (due to increased downtime linked to absenteeism<sup>20</sup>), as well as lower morale amongst the workforce. This seems reasonable, but what is unclear is why they tie the reduction of TFP growth to *unskilled*, as opposed to skilled, labour, since it is the activities of the latter that are involved. Indeed, the incorporation of the TFP assumption might be seen as having a similar (depressive) effect on the outcome as Acott’s higher skilled labour prevalence rates.

Lewis & Arndt have a far simpler and more reasonable approach than ING Barings to the adjustment of household consumer demand, suggesting simply that AIDS-affected households do not save at all, and raise their share of health spending significantly, at the expense of *non-food* items. They do not indicate the net impact of these adjustments on household savings rates and levels, which would be useful to know. The possibility of debt-financing by households is not addressed here either.

They assume that public sector health expenditure will increase its *share* of total current spending by nearly 75% through 2010, with the increase going to HIV/AIDS costs. The source of this rate of increase is unclear, in particular whether it is linked to some estimate of AIDS case cost levels and incidence. The assumed rate of increase in real public health expenditure – 6.9% per annum from 1997 to 2010 – is compared with the average annual increase of 5.7% between 1992 and 1997. It is worth noting that though there was an increase of a total of 26% in real terms during the two years from 1997 to 1999, this seems to have been a once-off exercise to push spending to a new level. In the four fiscal years from 1999 through 2002, that is to the end of the current Medium Term Expenditure Framework (MTEF) envelope, real health expenditure is projected to grow a total of just over 4%, that is, only about 1% annually. In other words, Arndt and Lewis’ projections of health spending are much higher than is (currently) planned by the South African government (and higher also than the ING Barings assumption of

R4-billion additional spending by 2008), with severe consequences for the negative impact of HIV/AIDS on the economy. Once again, the need for consistent and consensus estimates of AIDS treatment costs is underlined.

There are two economic assumptions worth noting. The first is that, as in the ING Barings study, additional government spending due to HIV/AIDS involves deficit financing rather than expenditure-switching, and thus represents additional demand for goods and services by government. As already noted, the additional spending is taken to be larger here than in the ING Barings analysis, and exerts expansionary pressure on GDP. But this positive impact is tempered by the second assumption, that the economy is supply-constrained, or to put it differently, investment is determined by available savings, which are not supplemented by additional capital inflows, since foreign savings are assumed fixed. Thus, rather than crowding out other government consumption demand, the additional spending crowds out investment, and the cumulative effect over time is even more contractionary.

The result is the large differences between GDP growth rates in the 'no AIDS' and 'AIDS' scenarios, as indicated above, and the even larger disparities between per capita income growth rates. It is not clear to what extent the more pessimistic scenario here is due to the steady expansion of GDP in the base ('no AIDS') scenario, which is due in turn to the steady growth of labour and (importantly) capital inputs in the model as a consequence of investment being linked directly to savings, and thus income, growth. This stable expansionary path bears little resemblance to the faltering and volatile South African economy in reality.

This serves to emphasise the importance of the underlying economic growth rate in shaping the epidemic's macroeconomic impact. 'Some countries with severe AIDS epidemics, including Botswana, Thailand and Uganda, have been growing rapidly' (Confronting AIDS, chapter 1). Such rapid growth reflects robust investor confidence, which rather than being severely dented by the HIV/AIDS epidemic itself, instead results in firms (and government) acting decisively and strategically to manage the problem and limit the damage to themselves, and thus to the overall economy. Such a more 'active' response would be reflected, in the macroeconomic model, in a more modest decline in both TFP and labour productivity, and probably also in the maintenance of capital inflows which would help to mitigate the impact of the higher deficit.<sup>21</sup>

The importance of external flows to help finance AIDS costs, and of efforts to limit productivity 'stagnation' is underlined by the authors' decomposition of the epidemic's negative impact into component factors, an exercise which suggests that nearly half the difference between the 'no AIDS' and 'AIDS' scenarios is due to the rise on the fiscal deficit, and about a third to the TFP growth reductions. As they point out, it is the assumption of continuing capital inflows in the Botswana model (BIDPA, 2000) which accounts for the 'negligible' economic impact of AIDS in that country, notwithstanding its *social* impact being apparently equivalent to South Africa. Evidently, the difference in prospects for capital inflows between Botswana and South Africa is related not to the AIDS epidemic, but to broader economic and investor risk considerations, and addressing these would reduce the impact of the epidemic itself.

It is worth putting the Arndt and Lewis conclusions into perspective by noting that their average GDP growth difference between 'no AIDS' and 'AIDS' is about half again as big as the largest projection by Over (1992) in his analysis of growth impact in sub-Saharan Africa, for which he used a Solow-type model with a similar savings-driven macroeconomic structure. Over's is a careful analysis of the sensitivity of the growth outcome to different assumptions about the distribution of the epidemic across skill classes, and the proportion of AIDS-related expenditure

financed out of national savings, and hence reducing investment. The impact is at its greatest when skilled workers are most severely affected and expenditure is entirely financed by savings, leading to a reduction in the growth rate of just over 1% per annum. Over also takes account of the stage of the epidemic, making a separate calculation for the group of countries where it is most advanced, for whom the economic impact then worsens to about -1.5% per annum on average, about the same order of magnitude as the Arndt & Lewis result. This can be interpreted in two ways – either it illustrates the importance of the TFP assumption in the South Africa study, or it suggests that the epidemic in South Africa might be more advanced than has been thought, reinforcing the growing support recently for this view, noted earlier.

#### Some directions for future research and analysis

- The comparison just drawn with Over (1992) underlines the importance of analysts and modellers carrying out sensitivity analysis on their assumptions, which has not been done by any of the three modelling exercises discussed. This applies to both epidemiological and economic assumptions, the latter referring to both investment crowding-out and foreign capital inflow assumptions.
- Considerable work is needed to improve the demographic projections, as discussed elsewhere, but also the 'bridge' linking these to the economic analysis by making use of census skill and population categories.
- Arndt and Lewis themselves identify a number of issues which need to be taken up: further research on household and employer coping behaviour, in particular consumption and investment demand adjustment; dynamic TFP effects, such as the impact on future skills levels through lowered education spending; and the impact of behaviour change in response to policy and organisational interventions to limit the epidemic's spread.
- It was noted above that the strength of CGE analysis lay in its capacity to differentiate amongst sectors and income classes, to produce a richer picture of income distribution and output composition impact. This has not yet been done. Also largely undeveloped thus far are the implications of the analysis for foreign trade, which is important given the spread of globalisation and the increasing openness of the South African economy.

#### Footnotes

1. Broomberg, Steinberg, Masobe & Behr (1993), which is a revised and shortened version of the 1991 piece by the same authors.
2. The ING Barings study contains research commissioned by ING Barings from WEFA. Acott (2000) is an extended critique of ING Barings.
3. A variant of this approach, still far more optimistic than the dominant view a decade ago, is the agnosticism expressed by Bollinger & Stover, who argue that the 'macroeconomic impact of AIDS is difficult to assess' (1999, 11). This position is repeated by Whiteside & Barnett (*Conceptual Guidelines*).
4. See Over (1992); Ainsworth & Over (1994); Kambou, Devarajan & Over (1994); Cuddington (1993a & b); BIDPA (2000); Nicholls et al (2000).
5. See AA Scitovsky & DP Rice, 'Estimates of the direct and indirect costs of AIDS in the United States', *Public Health Reports*, volume 102 (1), 1987.
6. Doyle, P. 'The impact of AIDS on the South African population', in Centre for Health Policy, 1991.

7. These data are for treatment without AZT. The costs cited *cum* AZT are more than double.
8. According to the authors, real health care expenditure, *excluding* additional AIDS expenditures, would grow from R15 billion to R35 billion (1991 Rands) between 1991 and 2005, an average growth rate of over 9.5% per annum. This may have reflected wild optimism on their part, but in fact, *including* all AIDS expenditures, real *public* health spending average growth will be just under 6.3% per annum between 1991 and 2002, the end of the current Medium Term Expenditure Framework, if government's spending projections for the next two years are adhered to. In 2002, public sector health expenditure is projected to reach R16.1 billion (1991 Rands), whereas Broomberg et al's projection of total health expenditure in 2002 is approximately R30-billion.
9. ASSA600 has since been updated to the ASSA2000 model. See Dorrington, 2000.
10. BER (2000) underlines the cautious optimism approach in its summary on ING Barings, while Acott (2000) is a critique of ING Barings motivated by what is seen to be its excessive optimism. The point made about the scenario being 'non-alarmist' does make one wonder whether some other, more depressing, scenario was calculated, but not presented.
11. See Cuddington, 1993a, page 179.
12. This view is also expressed by Acott (2000).
13. Limited hospitalisation and drug treatment for low-skill workers is in fact pointed out elsewhere in the ING Barings study, suggesting some inconsistency in the assumptions.
14. Per capita income in 1999 was R18 607, according to the SA Reserve Bank *Quarterly Bulletin*.
15. As well as the need to take account of changing public expenditure patterns.
16. This critique was developed under the supervision of Rob Dorrington, author of the ASSA600 model.
17. Lack of information also forces him to make some assumptions which might be different from the ING Barings study.
18. The only other CGE-based HIV/AIDS impact study known to these authors is Kambou et al (1992), on Cameroon. The model used there is an 'ancestor' of the standard CGE of South Africa used by Arndt and Lewis (2000).
19. Cuddington (1993b) presents a two-sector, rural/urban, version of this model.
20. They omit to mention downtime due to large numbers of workers attending funerals of colleagues and their families, which has been identified as a growing issue in several African countries.
21. Implicit in the argument in this paragraph is the view that investment is not savings-constrained.

# THE DEMOGRAPHIC IMPACT OF HIV/AIDS

## Background

In South Africa, demographic research into the impact of HIV/AIDS was initially led by the needs of the life insurance industry with a view to generating reliable estimates of changes in life expectancy over the projected development of the epidemic. This has remained a prominent focus of the larger scale demographic research. The body of work includes, most notably, the projections commissioned by Metropolitan Life (including Doyle in the early 1990s) and the Actuarial Society of South Africa (ASSA) which centres on the work of Dorrington. The literature reflects an ever-increasing sophistication of projection techniques and an improving reliability of prediction.

Efforts to meet actuarial needs dominate the South African demographic literature to the extent that the primary focus of the demographic contribution to the HIV/AIDS debate appears to be on estimating current and future HIV prevalence rates. The benefit of such projections goes well beyond the needs of the insurance industry and provides data which is of value to planners and policy makers alike. This includes estimates of probability of infection and term to death. However, as is discussed below, it appears that the projections themselves may prove inadequate to the challenge of identifying and targeting the most vulnerable groups, and also to measuring the efficacy of interventions.

The pronounced emphasis on projections in the local demographic literature is matched by a paucity of research in other areas of demography. Population projections are necessarily based on concepts of fertility, mortality and migration<sup>1</sup> and in these areas the data on which projections are based will need to be augmented by further research and systematisation of data collection.

The field of demography encompasses other issues which are important in understanding and managing the HIV/AIDS epidemic. These include trends in marriage, divorce, household and family formation, employment, ageing and migration. Similarly, family systems and structures, the role of women, the value of children and the social, cultural and institutional context of demographic change are issues which fall within the scope of demographic analysis. The scant attention demographers pay to these issues vis-à-vis HIV/AIDS is of deep concern.

There appears to have been limited use of demographic data on the part of those responsible for developing and managing intervention programmes. This suggests that the dialogue between demographers and those responsible for developing intervention and care programmes needs to be developed, arguably from both sides, but certainly from the demographic side by shifting research priorities to examine issues which are the direct concerns of those working in HIV/AIDS intervention and care.

## Demographic foundations

Clearly the larger part of demographic research in South Africa is based on a limited bedrock of data – the HIV prevalence rates among pregnant women attending public sector antenatal clinics. This is partly due to the absence of reliable, systematic data regarding death from AIDS, and a lack of sero-prevalence data which is population-based, geographically based, or sector-based.

Observations of AIDS-related mortality rates reveal that a sustained decline in

mortality rates was reversed in the early 1990s. From then, mortality rates increase for both infants and adults. While the increase is almost certainly due to AIDS, attributing these trends solely to that disease is somewhat more problematic. This has nevertheless been assumed as a working hypothesis in some of the literature. For example, on the assumption that the increase in mortality rate is solely attributable to AIDS, the Medical Research Council (MRC) concluded that half the deaths of people in the age groups 15 to 49 are attributable to AIDS related conditions. The MRC deduced that over the next 10 years between 5 and 7 million people will die from AIDS. The extent to which the increase can be attributed to AIDS bears further investigation, perhaps through an examination of other causal aspects of death including for example crime and accident related deaths.

The most recent literature suggests that, demographically speaking, 1999 was a defining moment for the AIDS epidemic. In that year there was the first appearance, from the data available, of indications that HIV had reached its maximum prevalence (or was showing signs of reaching that maximum). This levelling off of prevalence rates is now seen in a number of the demographic models.<sup>2</sup> These models also indicate that – barring significant changes in treatment, prevention and behaviour – the condition will maintain this level of *prevalence*. However, it must be noted that there is currently no data available that effectively plots or analyses *incidence*, and this aspect bears further analysis.

The end of the last decade marks a maturation of HIV/AIDS modelling procedures. Demographers' models have become increasingly sophisticated and literature is increasingly oriented around the same methods (Metropolitan and ASSA).<sup>3</sup> Until recently, simulations of the path of the disease relied on the presentation of scenarios of varying combinations of birth, death and migration rates. These invite users to adopt a scenario most in keeping with their own expectations – a situation not conducive to developing greater certainty about expectations as to the course of the epidemic. The subsequent refinement of demographic modelling has resulted in the appearance of greater consensus as to the future course of the epidemic. Alternatively the consensus in models can be seen as a consequence of reliance on a particular method.

The currently prevailing model is that of the Actuarial Society of South Africa (ASSA). This model has been termed a 'third kind' as it is neither a 'macro' or 'micro' model, but rather depends on the integration of behaviour with over-riding trends. The model is built on the foundations of the Doyle (Metropolitan) model developed in the early 1990s but the ASSA model is better calibrated as it includes access to data from the 1996 census, the 1998 Demographic and Health Survey, and the annual October Household Surveys. In the ASSA model, estimates of median term to death of those infected and estimates of sexual activity (and thus of infection) are used to project the demographic trends. The model is 'calibrated' to coincide with empirical observations. In essence, calibration is a way of according inputs into the model according to the weights that best ensure that observed trends are replicated.

Prior to 1999, much of the literature rested heavily on estimates and projections made by foreign and international agencies. The most prominent among these were UNAIDS, the U.S. Bureau of the Census, Abt Associates and the World Bank.<sup>4</sup> Various reports offer overviews and critiques of the different projections.

Despite the apparent success of the models in meeting the needs of the life insurance industry, their utility in informing activists and policy makers is less clear. A contrast between local and foreign demographic literature can be seen in the emphasis placed on predicting prevalence trends *versus* identifying risk groups. The international literature focuses on the need to identify groups at risk and measure the impact of intervention strategies.<sup>5</sup> Groups so identified can be

effectively targeted for intervention. It is here that the value of the local demographic modelling is most questionable, as assumed risks remain an important *input* into their models. The identification of groups most at risk has to be derived from other sources. The models thus offer little in the way of informing programme managers how successful interventions are, what groups they should emphasise, or where they should take place.

In many senses the most articulate model for predicting prevalence rates is the ASSA600 model which takes into account the vulnerability of four populations distinguished by their level of risk. All the projections rely ultimately on estimates of the prevalence of the disease among women attending public sector clinics (i.e. sexually active pregnant women) and it is this source of information that provides the most widely cited estimates of prevalence (22.4%)<sup>6</sup>. Not only does the literature tend to treat this figure as *the* prevalence rate, but those who use it often fail to indicate what it applies to. Of concern is the prominent role these prevalence figures play in the literature it is necessary to briefly review their validity as predictors of the true trajectory of the epidemic in the population.

The limitations of the antenatal clinic prevalence data centre on the representivity of the tests and the ability to extrapolate them to the wider population. These problems can be placed into two main groups 1) representivity of the test results and 2) the representivity of the population tested.

- 1) The test results are based on anonymous unlinked testing of a *sample* of women at selected<sup>7</sup> public sector antenatal clinics. This means that the results cannot be traced back to the patient and only the most rudimentary personal information can be linked to the data. This typically only includes the date of testing, age of the patient and the clinic from which the sample is taken. It takes little imagination to understand how useful additional linked data might be – for example marital and/or partner status, number of partners, contraceptive practices, social and economic context, HIV/AIDS awareness, and the like – all of which could be gathered in a context of confidentiality and which would considerably inform analysis of the data. Parallel socio-behavioural studies of communities where the antenatal services are located would also be of benefit.

The antenatal clinic data collection method results in possible reliability problems arising from sampling error in clinic and patient selection. In the literature, few prevalence estimates reflect uncertainty arising from sampling and almost none of the literature emphasises confidence intervals which are necessary to take into consideration given the methodology.<sup>8</sup> Additionally it is simply assumed that the clinics selected were randomly chosen. Due to the lack of transparency in the selection process the possibility that the sites were selected on any other basis (like optimising the number of cases found) cannot be excluded. If the sites were not selected on a random basis, then a bias has probably been introduced into the results. This factor is not commented on in any of the literature.

One partial exception to this lack of statistical rigour in the literature is provided by the Department of Health. In their annual summary they present HIV prevalence figures at antenatal clinics at 95% confidence levels.<sup>9</sup> However, they don't take the design effect into consideration and report the levels as if the sites were selected randomly.

- 2) Despite the use of anonymous unlinked testing, women are required to give their permission for the test.<sup>10</sup> The literature at hand does not reveal the extent and nature of refusals. If there are a significant number of refusals and if the refusals are concentrated in either the HIV positive or negative groups the results will be further biased.

None of the literature reviewed acknowledges these limitations as being of particular importance and most assume that the antenatal prevalence rate can be taken as given. Some of the research questions the weighting used by the Department and re-weight it accordingly.

Those who attend antenatal clinics constitute a small fraction of the total population at risk and an even smaller fraction of the total population. Despite this, the course of the disease in this population, it is assumed that this indicator constitutes a reliable indicator trends in the population as a whole. Obviously the extrapolation of trends from this population to the wider adult population is problematic as it excludes men and those women who are not sexually active, amongst other limitations.

Even within the sub-population of sexually active women, certain groups are either underrepresented or excluded entirely. These groups include women who are using contraception (including those who may be using condoms to prevent HIV transmission), those who are infertile or not of child-bearing age, those who use private health care facilities and those who are unable (or unwilling) to use state health facilities. There is an assumption of commonality of risk across these categories. This is a problematic assumption – for example people in mutually faithful relationships, those who consistently use condoms, those not sexually active, amongst others, are exposed to considerably lower risk levels than those of pregnant antenatal clinic attendees. Research amongst youth in six contexts in South Africa by Kelly, for example, demonstrates considerable differences between populations in the practice of risk prevention behaviours and very high levels in particular populations.<sup>11</sup> There is also the matter of reduced fertility amongst HIV positive women which needs to be taken into account.

Each of the above factors are not necessarily problematic if enough is known about the size and extent of the deviation from the observed patterns.<sup>12</sup> For example, if it is known how many women use non public sector antenatal services and what their HIV prevalence is, a reliable estimate can be made for pregnant women as a whole. However, the lack of data from such facilities regarding HIV status, and the use of HIV testing unlinked to basic demographic and social data by the antenatal study, forces demographers to make assumption regarding prevalence and generalisability.

To estimate the prevalence of HIV in the wider population substantial additional information is required – specifically information pertaining to the population outside of the antenatal clinic frame of reference. These populations are described at some length in the local and international literature. They also form the basis of the four risk groups used by the Metropolitan and ASSA models.<sup>13</sup> These groups are typically defined according to their risk of infection and the probable mode of infection.<sup>14</sup> They include the population categories listed below. Besides knowing the population of every group it would be helpful if the other information commented on also becomes available. None of the literature goes much beyond defining the groups and suggesting risk levels from case studies.

- *The sexually active population other than pregnant women.* Adequate modelling of the prevalence in this population requires estimates of condom use, current abstinence and monogamy. Some effect is given to this dimension by categorising the population according to risk. Risk categories include men living in single sex accommodation or otherwise staying away from home for lengthy periods. This group includes soldiers, migrant labourers, mineworkers etc. Obviously the conditions under which these groups live also demonstrate substantial variance.
- *Infants:* Without prophylactic treatment infants may contract the disease from



their mothers at birth or contract it at a latter stage from breastfeeding. This requires knowledge of the use of prophylactic treatment and the extent (and timing) of breastfeeding.

- ❑ *Men who have sex with men.* This dimension can only be modelled if the number of men who have sex with men is known.<sup>15</sup> A refinement would include an aggregation of the degree of risk of the sexual acts in question in terms of type and frequency. Also required would be some estimate of bisexuality in that population.
- ❑ *Commercial sex.*<sup>16</sup> This risk category includes the sale of sex (by commercial sex workers, rent boys or those who are forced into 'survival sex' coupled to the extent of condom use. Knowledge of their clients in terms numbers and social background is also desirable.

To overcome the dearth of information modellers, are usually forced to resort to assumptions. To some extent, the success of the estimates/projections now being made reflect the adequacy of their assumptions. However the literature seems to suggest that demographers end up modelling their assumptions rather than verifying the adequacy of those assumptions. Further research is needed into these assumptions and it should be noted that very little of the local demographic literature offers a substantial critique of these models.

### Behaviour change assumptions

The ASSA modelling instrument has been calibrated using behavioural data from the 1998 Demographic Health Survey and the instrument has been developed so that behavioural data can be added to the underlying assumptions. Given that there is a paucity of behaviour change data to work with, ASSA models contain assumptions of no behaviour change, and no significant change in societal response. In the context of there being actual behaviour change amongst the antenatal population, the model will prove to be inaccurate without inclusion of such data. However, ASSA has proven accurate in predicting the next year's antenatal statistics and this suggests a lack of significant behaviour change in the antenatal clinic population. However, considering that the most widely promoted prevention intervention has been condom use, and pregnant women are by definition not regular condom users, the antenatal statistics sample out those who have responded positively to the intervention.

It can be expected that as the epidemic progresses and as behaviour change begins to be a more significant epidemiological factor there will be an even greater need, for purposes of understanding and modelling the epidemic, to build these changes into modelling efforts. Behavioural surveillance particularly, assists in explaining trends within and between data sets and data derived from behavioural surveillance would be an important supplement to the existing antenatal clinic based HIV surveillance systems. Unfortunately behavioural and social research is scant and there is very little national data behavioural prevention data available. The need for such data is particularly urgent in the mature stages of the epidemic, where vectors of infection are more diffuse and where the boundaries between high and low transmission populations become less distinct.

### Other demographic foci

As indicated above, local demographers have been largely concerned with the impact of HIV/AIDS on the size and shape (age) of the population as well as its effect on life expectancy. The estimates have nevertheless also formed the basis for the estimation of the economic cost of HIV/AIDS. The nexus between the two foci

is the age-specific life expectancy tables produced by the ASSA and other models. The cost of the premature death of the population belonging to the economically active age cohort forms the basis for estimates like those made by ING Barings.

ING Barings<sup>16</sup> indicate that numerically the burden of the disease will be borne by unskilled labour. However they indicate that much of the economic cost will stem from the premature death of more highly skilled labour. The actuarial models are linked to the skill and employment distribution of the labour force by use of a 'map' derived from the 1996 Census. This then makes it possible to use the demographic data as the basis for cost estimates. However, the assumptions underlying this 'map' based on the census need further interrogation and examination. Some of the literature, for example the work Stillwaggon, suggests that social status, poverty, inequality, amongst other factors, impact directly on susceptibility to infection and to the term to death.

Stillwaggon and other writers suggest that vulnerability to HIV/AIDS is heightened by poverty and relative deprivation. Ignorance of HIV/AIDS and the lack of education in general is touted as a primary determinant of vulnerability in much of the literature, yet in South Africa, both the Demographic Health Survey and the Sentinel Site Surveillance Study of the Beyond Awareness Campaign conclude that there are high levels of awareness, as well as uptake of key prevention strategies. Clearly the relationships between awareness and sexual risk practices are not well understood by many demographic researchers.

Despite the indication that the management of HIV/AIDS could benefit enormously from knowing the relationship between poverty and HIV/AIDS, demographers have largely limited their contribution to projections and to occasional forays into issues like estimating the number of children likely to be orphaned by the disease. To clarify the relationship between poverty and HIV/AIDS a team at the Health Economics and HIV/AIDS Research Division are currently involved in a project looking closely at the relationship between poverty and HIV prevalence and are working on developing a non-linear model of the relationship between these variables.<sup>17</sup>

Some other questions that have not been covered in the existing literature and which fall primarily within the ambit of demographers are:

- ❑ *Actual HIV rate:* Prevalence rates in all categories other than pregnant antenatal clinic attendees who are not lower to middle class are still required. Without this, a reliable national estimate will not be possible – nor will the targeting of vulnerable populations.
- ❑ *AIDS rate:* As the epidemic matures, deaths from AIDS will increase. Knowing the proportion of the population with AIDS then becomes increasingly important for monitoring progress and measuring the efficacy of interventions. This cannot be deduced from the term to death and HIV rates without knowing when HIV was contracted. The term to death used in the simulation models is also somewhat questionable.
- ❑ *Term to death:* The literature usually assumes a ten (or eleven) year term between infection and death. However it appears that this is based on early US studies which involve both a different HIV strain and dramatically different socio-economic context, given poverty and other factors. The term to death in South Africa may be significantly lower (eg. 6-8 years) and urgently needs to be reviewed. This review may throw further light on the effect of poverty and the delivery of essential services.
- ❑ *The impact of poverty:* While the literature suggests that poverty increases susceptibility to HIV/AIDS, the relationship between these dimensions in the South African context could bear empirical scrutiny. Intrinsic to such study

would be changing household structures, the impact of declining opportunities for labour migration and improved delivery of essential services.

- *Migration*: Migrants have long been known to be a high risk group. However an examination of the social capital of the contexts within which they relocate themselves may help explain how the disease can be contained regionally.
- *Impact amongst the elite*: The economic literature suggests that the greatest economic cost stems from the premature death of skilled labour. The literature fails to speak to how vulnerable the South African elite is to AIDS and how this vulnerability will impact on governance and the economy. It appears that in South Africa the elite is less vulnerable, yet in countries such as Botswana, the elite has been dramatically affected. These proportions and relative numbers need to be clearly understood.
- *Vulnerability of labour*: There is insufficient knowledge of the relative risks in various labour categories and sectoral contexts, which makes broader demographic and macroeconomic impact analysis difficult, and constrains appropriate intervention and strategy development.
- *Orphaning*: Various estimates indicate that the impact of orphaning may be pronounced and prolonged. Questions arise as to the ability (and inclination) of the extended household to absorb new orphans. However these questions erroneously assume that there is an adequate understanding of existing familial arrangement in a rapidly changing socio-political environment. The demographic literature in South Africa appears fundamentally unable to anticipate how the household will change and whether or not orphans will be forced to resort to the streets.
- *Household structure*: With the depletion of the economically active population and the increasing burden being placed on the extended family and the elderly by orphans, the relations of production in rural areas are already starting to change. Subsistence farmers appear to be moving from field production to other crops that require less labour, or labour that can be performed closer to the homestead. Typically the latter may include garden production (perennial crops close to the homestead) or, as can be seen in Zambia and parts of Mpumalanga, the production of cassava and other rooting crops. This change has obvious implications for household nutrition and somewhat less immediate implications for household structure. Stover and Bollinger argue that any reduction in food production may have serious implications in areas where food security is in question.

## Conclusion

In South Africa the demographic literature on AIDS/HIV points to various lacunae. Many fundamental questions have yet to be addressed, and this has serious implications for policymaking and for understanding the economic impact of HIV/AIDS. Nevertheless, demography is central to measuring the impact of HIV/AIDS and also to pointing out viable interventions. An expanded and rigorous approach is thus urgently required.

## Footnotes

1. Simulations tend to deal with deviations from the expected trends in mortality etc. that can be attributed to HIV/AIDS.
2. Stover, J. (1996) The future demographic impact of AIDS: What do we know, The Futures Group International, Washington, p. 7.

3. The scenario modelling is also used by the U.S. census Bureau, see Stover, J. (1996)
4. Stover, J. (1996)
5. UNAIDS (2000) Guidelines for second generation HIV surveillance, UNAIDS, Geneva, p. 4
6. Department of Health (1999) National HIV seroprevalence survey of women attending public antenatal clinics in South Africa, p. 7
7. See Department of Health (1999) p. 3 (487 participating clinics)
8. See Department of Health (1999) p. 6
9. See Department of Health (1999) p. 15
10. See Department of Health (1999) p. 5
11. Kelly, K. (2000) Communicating for Action: A contextual evaluation of youth response to HIV/AIDS, Beyond Awareness Campaign, Department of Health, South Africa
12. For an overview of one type of adjustment see Matabeni, Z. (2000) Has South Africa turned the corner? Reassessing the recent HIV prevalence rates, Joint Population Conference, Port Elizabeth
13. The four groups which are used by Doyle and Dorrington are (in order of decreasing risk) are PRO, STD, RSK and NOT. The categories respectively represent the high risk category of sex workers and their clients, the population with sexually transmitted infections, the population otherwise at risk of contracting the disease and, lastly, the population not at risk (i.e. who have negligible risk of infection).
14. Stover, J. and Bollinger, L. (1999) The economic impact of AIDS, The Futures Group, Washington
15. ING Barings (2000) Economic Impact of AIDS in South Africa: A dark cloud on the horizon, ING Barings, Johannesburg
16. See ING Barings (2000) where such extrapolations are made relying on unpublished internal reports
17. Kelly, K., November 2000. Interview with Chris Desmond and Jeff Gow, HEARD, Durban.

## THE ECONOMIC IMPACT ON SECTORS

The literature on sectoral impact can be divided into two. The first group, which is very much the larger, consists of short action-oriented pieces directed at stakeholders and practitioners within specific sectors, intended to inform them about the issues and encourage them to make interventions to mitigate firm and sectoral level impact. The bibliography includes entries for these items, and as can be seen, most sectors in South Africa are covered to a greater or lesser degree. The major contributor has been HEARD at the University of Natal, through its *AIDS Briefs*, and its publication *AIDS Analysis Africa*. These pieces have served an extremely useful purpose, but strictly speaking they are not 'research', and are thus not evaluated as such.

The second set of work is research-based material concerned with measuring and evaluating the impact of the HIV/AIDS epidemic on individual sectors or across sectors. This set is very small. It comprises two volumes dealing in some depth with the mining sector,<sup>1</sup> one of which is an in-depth study of a mining community, and the other a survey of the dimensions of the impact of AIDS on the mining sector. Mining is certainly the sector of the South African economy which was studied earliest and has been subjected to the most in-depth analysis. The reasons are well-known: in particular, the migrant labour system which separated workers from their families for long periods, and encouraged sexual contact with multiple partners, led to much higher HIV incidence rates. For similar reasons, that is, high levels of worker mobility, the trucking sub-sector within transport was an early focus of attention and remains a high-risk sector.<sup>2</sup> In both mining and transport, the trade union played an important role in raising the profile of HIV/AIDS as an issue and in educating workers regarding the risks. Risks of infection are also higher than average for workers in the hospitality industry.

In all of these industries, it is generally the semi- and unskilled workers who are at risk. In some service sectors, such as finance and information technology, the risk is not that the prevalence rate will rise, but that the costs of replacing highly skilled workers will be prohibitive. Risks seem to be lowest in manufacturing sectors.

Within the public sector, the health and education sub-sectors, which are amongst the largest employers, face particular risks. Health care workers face higher risks of infection from non-sexual activity, as they have extensive contact with HIV positive individuals in their line of work. In addition, the overloading and underfunding of the health system as a result of the epidemic raises the stress levels for health care workers. Similarly, for teachers, the risk is not simply of infection, but also higher stress in the job as children from households with PWAs are forced to drop out of school, or attend sporadically, due to greater responsibilities within the home, lack of funds or being orphaned.<sup>3</sup> Abt Associates is undertaking work for the responsible national government departments in these two sub-sectors.

A set of reports to be released very shortly and which promises to be interesting are Goyer and Gow's study of HIV/AIDS within the prison system.<sup>4</sup> Like the mine compounds, both the prisons and the military<sup>5</sup> are 'total institutions' in which people are housed in massed, single-sex and authoritarian conditions, which encourages high risk sexual activity.

## Priorities for future research

There is very little focussed sector-level analysis so that it could be argued that any work of this type should be prioritised. However, it may be possible to make choices between sectors, by using sectoral outcomes of economy-wide modelling exercises. The ING Barings study includes an attempt at sectoral risk ranking (outside the context of the macroeconometric model), but this is by their own admission fairly crude and preliminary. As noted in the macroeconomic impact discussion, it is disappointing that the CGE modelling work has not thus far yielded any sectoral level results which would allow some differentiation of the impact upon sectors. The CGE approach is well suited to addressing this issue, because of the underlying input-output framework, which makes it possible to take account not only of sectors where labour is at high risk, but also sectors where the risk from the epidemic lies in demand shifts (either up or down). Preliminary results from such modeling exercises may help to identify sectors where focussed research would pay off.

The National Population Unit has indicated that it will in future be collecting and presenting sectoral data to enable more focussed research. This initiative is to be encouraged.

## Footnotes

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3. Badcock-Walters, P. and Whiteside, A. (1998) HIV/AIDS and Development in the Education Sector, HEARD, Durban
4. Goyer, K.C. and Gow, J. (2000) The role of prison conditions in governing policies in increasing HIV/AIDS infection in South African Prisoners, HEARD, Durban; Goyer, K.C. and Gow, J. (2000) Contributing factors to increased levels of HIV transmission in South African prisoners, HEARD, Durban; Goyer, K.C. and Gow, J. (2000) Alternatives to current HIV/AIDS policies and practices in South African prisons, HEARD, Durban
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# IMPACT ON FIRMS AND WORKPLACES

## Background

Literature documenting research on the impact of HIV/AIDS on South African firms is scarce and uneven. Two studies have attained prominence within this body of literature: the ING Barings Report on the economic impact of AIDS in South Africa and Bollinger and Stover's report on the economic impact of AIDS.<sup>1</sup>

The economic impacts are listed in terms of the following effects:

- ❑ AIDS-related illnesses and deaths of employees affect a firm by both increasing expenditures and reducing revenue;
- ❑ expenditures are increased for health care costs, burial fees, and training and recruitment of replacement employees;
- ❑ revenues may be decreased because of absenteeism due to illness or attendance at funerals and time spent on training. This is the case not only for the individual person with HIV/AIDS, but also for others who will give up their labour time to care for persons with HIV/AIDS;
- ❑ labour turnover can lead to a smaller and/or less experienced workforce that is less productive;
- ❑ increased labour turnover will lead to loss of skills, loss of tacit knowledge, and declining morale;
- ❑ labour replacement and other direct and indirect costs will result in higher production costs;
- ❑ an increased demand for benefits would add 15% to remuneration costs of an average manufacturing company by 2005;
- ❑ benefit packages will have to include adequate insurance cover, retirement funds, health and safety provisions, medical assistance, testing and counselling, and funeral costs;
- ❑ all of these factors would result in the reduction of operating profits for firms.
- ❑ enterprises would be likely to invest in more capital-intensive technology/production.

## Modeling methods

The methods of econometric modeling in the ING Barings Report are based on the ASSA demographic model, adding infection and mortality profiles by skills levels and for selected sectors. No changes were assumed for the calculations on the second cycle (2000-2015). The impact of the counterbalancing effects of the AIDS epidemic were explored with Wefa's annual macroeconomic modeling framework (long-term forecasts being trend forecasts, excluding considerations of business cycles; based on a full supply-demand econometric model).

While the methods of econometric modeling are clearly spelt out, and detailed data on sectoral impact are provided, the calculations and projections of the Report have come under critical scrutiny, primarily on the basis of the problematic calculations of seroprevalence rates and the overlay of various sets of data whose links can be described as tenuous at best.

It has been pointed out that virtually all work on the costs of HIV to companies to date has estimated the annual costs of prevalent infections in the year in which

the costs are incurred. On the basis of the fact that companies incur responsibility for future costs in the year in which the employee is infected, it is to be regarded as an incident rather than a prevalent infection. This suggests an alternative methodology. It is incidence rather than prevalence that should be the basis for estimating the costs of HIV/AIDS to a company. 'It thus makes sense, from an investment appraisal perspective, to estimate HIV costs as a present value, discounted at the rate the company applies to its other potential investments'.<sup>2</sup> On the basis of this incidence-approach, it can be said that the long-run costs of the epidemic in its early stages when incidence is high but mortality and morbidity are low, are understated; and the costs in the later stages, when there is a great deal of morbidity and mortality but relatively fewer new infections, are overstated. Company AIDS policies would have to bear in mind the relationship between prevalence and incidence: 'A company looking only at prevalence-based estimates might... be led to invest too little in HIV prevention and management early in the epidemic, when such investments are likely to have the greatest impact, and to invest more than is necessary as the epidemic winds down'.<sup>3</sup>

What would be required, moreover, would be detailed demographic projections of the workforce in particular enterprises, because HIV infection rates tend to vary considerably with age, sex, race, geographical location, job level and risk environment. While the incidence-based approach can and does take account of this, this approach has not yet been brought to bear on firm and sectoral impact studies. Regional studies have shown, however, that impacts cannot be uniformly projected.

#### Regional studies of impact on firms

A study examining several firms in Botswana and Kenya documented that the most significant factors in increasing labour costs were absenteeism due to HIV or AIDS, followed by increased burial costs.<sup>4</sup>

By contrast, a study in Zimbabwe found that the major expense was health care costs. A transport company in this study employs 11 500 workers. The company offers significant health benefits to its employees causing the cost of AIDS to be even higher than for other companies that do not provide similar benefits. The total costs of AIDS to the company in 1996 were estimated at Z\$39 million, equal to 20% of profits. More than half of this amount resulted from increased health care costs. The report speculates that HIV/AIDS will worsen employee morale, create greater labour-management tensions and cause a labour shortage in skilled positions.

A study in South Africa examined the expected impact of AIDS on employee benefits, and thus on corporate profits. It found that at current levels of benefits per employee, the total costs of benefits would rise from 7% of salaries in 1995 to 19% by 2005. Since these additional costs will have to be paid at the same time that productivity is declining due to HIV/AIDS, the net impact on profits could be significant.<sup>5</sup>

A case study of the economic impact of HIV infection in a cohort of male sugar mill workers from the perspective of the industry<sup>6</sup> provides specific projections of costs to the company based on tracking of six years and using well-triangulated data.



## Research needs

The economic impact of HIV/AIDS on South African private sector companies has been understudied (although it is well known that many studies have been conducted, but that these remain outside of the public domain). The few studies reported in the available literature are small in scale and tend to concentrate only on primary impact in terms of direct costs, such as reduction of productivity, loss of revenue and the like. Secondary costs, for example low employee morale or decreasing competitiveness in the global economy are not considered, let alone quantified.

A new model for assessing the costs of HIV/AIDS in workforces, however, could create positive effects both in terms of more differentiated and sectorally specific data, and in terms of workplace and company policy interventions.

In consequence, 'the incidence-based approach allows companies to treat HIV prevention and management as an investment, rather than simply as a cost. Using this approach, the returns or benefits to the company of investments that prevent a new infection or extend an infected employee's working life are equal to the costs that would have been incurred if the company would not have made the investment.'<sup>7</sup> This approach has the added advantage of making results comparable from one company to another. However, this model awaits application and testing.

## Footnotes

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# THE ECONOMIC IMPACT ON HOUSEHOLDS

## Background

Research interest in the socioeconomic impact of HIV/AIDS in sub-Saharan Africa is intense and growing fast, but studies that focus on the South African conditions and household impact are infrequent. It would seem that the health and medical aspects of the pandemic in South Africa have overshadowed the social and economic implications, and thus there is a tendency for research and analysis to focus on the former. Nevertheless, lessons learned in other developing countries, particularly in Africa, are useful in determining both the research needed within the South African context, and possible efficacious responses.

Themes covered in the available literature include the following:

- ❑ micro studies of impact on (predominantly rural) households affected by HIV/AIDS;
- ❑ impact of HIV/AIDS on the lives of children;
- ❑ AIDS orphans;
- ❑ generational aspects - impoverished grandmothers supporting orphans;
- ❑ poverty and emiseration as result of HIV, promoting the spread of HIV in turn;
- ❑ social conditions that act as barriers to preventive responses;
- ❑ gender perspectives;
- ❑ social support and familial coping mechanisms;
- ❑ impact of HIV/AIDS on low-cost housing.

A great deal of research has been done on the impact of HIV/AIDS on households in developing countries – with particular emphasis on regions in East Africa. However, these impact studies tend to be specific to particular locations, communities, and faith orientations resulting in findings that are not readily generalisable to the country as a whole or even to other regions. The studies are nonetheless useful because they independently establish certain commonalities that distinguish households that have encountered the disease.

## Economic impact

Stover and Bollinger<sup>1</sup> give a fairly representative overview of the economic impacts likely to be experienced by households that encounter HIV/AIDS. Household impacts take hold as soon as a member of the household starts to suffer from HIV-related illnesses. They manifest themselves in:

- ❑ loss of income, from less labour-time, or from lower remittances of the person with HIV/AIDS (who is frequently the main breadwinner);
- ❑ increase in household expenditures for medical expenses;
- ❑ decrease in household savings;
- ❑ other members of the household, usually daughters and wives, may miss school or work in order to take care of the sick person;
- ❑ death resulting in permanent loss of an income, funeral and mourning costs, and the removal of children from school in order to save on educational expenses and increase household labour capacity, with the effect of a severe loss of future earning potential.

Few of these potential household impacts and impinging social costs have been

quantified. A study conducted in Thailand found that with the illness and death of economically active household members from AIDS-related causes, the total income per capita and total consumption per capita decreased dramatically.<sup>2</sup>

Studies focusing on the economic impact on firms, businesses and sectors tend to exclude social impacts as a context for economic impacts. The degree of social resources (conceptualised in terms of social capital, and expressed in activities in civil society, in mobilisation of community organisations, and reliance on extended household networks) as potential mitigating factors falls out of their ambit. Among them are practices of re-allocation of labour as well as relying on extended family in terms of care, labour, and borrowing. However, there are limits to the reliance on these networks and on household reciprocity to provide resources and care in resource-poor settings.

Apart from a biomedical and social survey in the Carletonville mining community,<sup>3</sup> there are very few studies examining the link between household and sectoral impacts. Household studies of the impact of HIV/AIDS could serve to amplify, supplement and possibly modify some of the sectoral impact studies. This is indicated especially in studies on agricultural systems, where household subsistence (especially household food security and labour mobilisation) is tied up with agricultural production systems. This is possibly the reason why most household impact studies to date are being conducted for particular rural settings, with only limited generalisability. Nevertheless, there is a call for more research into the location-specific agricultural impact of HIV/AIDS.<sup>4</sup>

Studies emerging in the last two years on population and poverty, and on poverty and HIV/AIDS paint a vastly more complex picture than the one usually assumed in descriptions of the link between poverty and disease. This is borne out by studies conducted by the Population and Poverty Studies Programme at the University of Natal/Durban. A forthcoming book entitled *Economic mobility and poverty dynamics in developing countries*<sup>5</sup> will carry an article by Julian May on 'Social Capital and Development in South Africa', which is informed by a current research project on local communities, social capital, and the dynamics of income distribution and poverty. At same university, research work is being undertaken under the auspices of the Health Economics and HIV/AIDS Research Division, to investigate the non-linear relationship between HIV and poverty. Chris Desmond is studying the impact of HIV/AIDS on livelihood at the household level, through field work in a particular community in Bergville.

Complex socio-economic processes are at work in household and community coping strategies.<sup>6</sup> The household should not be regarded as a static and homogeneous unit. The very definition of a household would have to be refined, and specified for particular local contexts. Household and community structures, geographic and ethnic factors, religion, gender, age and marital status have been found to influence patterns and impact of the spread of HIV/AIDS. Thus, it has been argued, district-specific interventions are required that can take these specificities into account in designing interventions and planning for impacts.<sup>7</sup>

What also requires specification is the differential impact of HIV/AIDS in terms of the status of the household member infected with HIV. It was found, for instance, that the death of adult women tend to have a stronger negative effect on consumption than the death of adult men. Demographic changes in household structure, for example, the increasing percentage of older people in households affected by AIDS-deaths – is likely to entail cultural and socio-economic changes across households.<sup>8</sup>

There is broad consensus about the finding that the burden of the socioeconomic impact of HIV/AIDS is disproportionately affecting rural women, especially AIDS

widows and their dependent children in patrilineal systems, who become particularly vulnerable as they lose access to land, labour, and credit. Where this is compounded by stigmatisation and discrimination, members of the household affected by the illness or death of a person infected with HIV are likely to lose the support of their extended social networks.<sup>9</sup>

Children left destitute by families living with HIV/AIDS in resource-poor settings are of particular concern in many of the household studies cited. Their well-being contrasts very unfavourably with that of their non-orphaned counterparts. Children left hungry, exploited, and abused become more vulnerable to HIV infection in turn. The growing number of AIDS orphans and the phenomenon of children bringing up children raises the need for urgent responses, interventions, and research. A rapid appraisal of children living with AIDS in South Africa has been done by Rose Smart (1999) under the aegis of 'Save the Children'. Smart's documentation of the issue and of approaches for alleviation is a good resource that covers the level and extent of programmes and foci for interventions.<sup>10</sup> HEARD at the University of Natal is currently quantifying the costs of orphan care, with six models of orphan care at different levels of quality of care. The need to strengthen extended family resources is seen to be critical to stemming the abandonment of children and the associated social problems.<sup>11</sup>

Studies depicting the situation of AIDS-afflicted urban households are rare. The literature does, however, strongly suggest that HIV/AIDS affects urban and rural households differently and moreover that the burden on rural households is disproportionately compounded and high.

The quality of research about the impact of HIV/AIDS on households is uneven. Most studies are qualitative and rely on small samples. While calling for more detailed accounts that can register the complexity of household and community structures, the reported research has demonstrated that poverty promotes the transmission of HIV/AIDS and that development goals cannot be reached without addressing the containment and management of the epidemic on all fronts. The lack of research on household impacts and coping strategies, on integration of household and community initiatives with broader campaigns and supportive interventions and planning, is seen as the chief barrier to successful response at all levels.

## Research needs and priorities

For an appropriate response to address and support the needs of AIDS-affected households in South Africa more research is needed to establish the specific impacts in urban as well as rural settings. Cities and towns of different sizes and locations must be included for study to determine commonalties and differences. Although some rural impact studies have been done in South Africa (KwaZulu-Natal), what is needed is a rural database that would be directly comparable with urban data. What is needed is a methodologically sophisticated controlled study of chosen rural and urban populations to generate data that are internally and externally comparable and that can be triangulated by other sources (ie. clinic records, death statistics, etc). Such a study should also examine and quantify the social costs to households who encounter HIV/AIDS. More specific research requirements include the following:

- development of key economically related HIV/AIDS indicators in defining household and community impacts;
- monitoring and analysis of including that of indicators;
- microstudies of the relationship between HIV/AIDS and poverty.

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# THE RESPONSE OF GOVERNMENT

## Policy and interventions, fiscal and financial issues

### Background

In the context of a rapidly escalating HIV/AIDS epidemic, there is a desperate need for clear political leadership and vision on the part of national government. The cases of Uganda and Senegal demonstrate that a leadership committed to a definite and well-articulated policy can have a significant impact on the course of the epidemic. The policy in South Africa has been characterised by detours, side-shows, and cul-de-sacs including, for example, Sarafina, Virodene, examination of the links between HIV/AIDS, amongst others. Astonishingly little is heard of the progress and achievements of what were intended to be key national government interventions such as the 'Partnership on AIDS', and the National AIDS Council, let alone the more pragmatic aspects of the response to the epidemic.

### Emerging trends

There is a growing trend within national, provincial and local government, to mainstream the issue of HIV/AIDS, and in many instances there is evidence of collaboration and co-ordination between government departments. Yet the wider communication and collaboration with actors in the NGO sector, research institutions, and with organisations of people living with HIV/AIDS is far from satisfactory.

This review is based on data from national government departments, adduced research findings from health systems analysts (Partnerships for Health Reform; Abt Associates; Centre for Health Policy, University of the Witwatersrand; Health Economics Research Unit, University of Cape Town) and international organisations (primarily WHO, UNDP and UNAIDS) to attain a comparative perspective and a sense of how the effectiveness of the government responses can be assessed.

### National government

In the recently released World Health Organisation Report for the year 2000, South Africa ranks 57<sup>th</sup> when it comes to the availability of funding and resources for health, yet in terms of the efficiency of health care delivery, South Africa takes 175<sup>th</sup> place.

South Africa is living with a legacy of inequalities and poor health status and social development indicators. This is despite a relatively high level of health care expenditure of 8.5% of GDP in 1995; and 10.5% of total government expenditure in 1995/96).<sup>1</sup> Health care expenditure as a percentage of total government expenditure rose to around 16% from 1997.

The social and economic impact of HIV/AIDS threatens to compromise other economic, social, and political goals, and the developmental gains of recent decades. But it is not just the absolute impact that raises alarm. Responses are hampered by the structure of the health services, and by the impact of global economic forces engendered by structural adjustment programmes and fiscal

discipline written into macroeconomic frameworks. In 1996 the World Health Organisation noted growing gaps in health status and health care around the world, including socioeconomic status, between geographical groups, by gender, race, ethnicity and age groups.<sup>2</sup>

To challenge some of the global economic forces that provide the setting for local social services, campaigns for debt relief programmes have been launched in many African, Asian and Latin American countries. Freeing up funding through debt relief could benefit the HIV/AIDS prevention and mitigation strategies in line with UNAIDS advocacy of debt relief for developing more comprehensive responses to the HIV/AIDS epidemic.<sup>3</sup>

Whilst the national government refers to the development strategies of GEAR as a response to socio-politically conditioned poverty and ill health, the aims of limiting state expenditure on social needs have been identified by others as being counterproductive in dealing with the socioeconomic impact of HIV/AIDS:

*'... the notion of health as a cornerstone of economic growth, as a multiplier of human resources, and most importantly as a primary objective of such growth, has been replaced ... by an opposing notion. Public health services and health care for all are now perceived as an obstacle ... threatening public finance and the wealth of nations; reduction in health expenditure (...) has become one of the top priorities for ... governments'.<sup>4</sup>*

This contradiction has been played out in part in the backtracking on health care financing policy changes formulated between 1994 and 1997. This is despite a significant increase in the health budget allocation from 1994 onwards, and more especially between 1997 and 1999. From 1994 onwards, a series of policy actions were initiated to create a health sector re-allocation formula, among them the removal of fees for maternal and child health care, and general primary care. However, the process of the implementation of a social health insurance that included private insurance regulation proposals, was stalled. This translated into the failure to find an extra-budgetary source of funds and a mechanism to achieve greater cross-subsidisation between the private and the public health sectors.

Presently, the provinces receive unconditional block grants. The provincial health departments determine how this grant is to be divided between local authorities, and between the different types and levels of health services in the respective provinces. Some health systems analysts are critical of this mechanism, pointing out that it will prevent health budget re-allocations, resulting in poor productivity of expenditure. What is required, they point out, is the establishment of 'norms and standards' for health care provision to influence future resource allocation patterns.<sup>5</sup>

The credibility of the national department of health in budget allocations to provincial government has been called into question with revelations (in the Medium Term Budget Policy Statement released at the beginning of November 2000) about underspending during this financial year. For example, a considerable proportion of monies allocated for the rehabilitation of hospitals around the country has not been spent for the second year running.<sup>6</sup> There are also indications that underspend has occurred across a range of key areas including HIV/AIDS specific activities.

There is a call from both government ministries/departments and business, to generate sectorally specific and differentiated responses to the impact of HIV/AIDS which are only recently being factored into the impact analysis. To date, the projections of the impact of HIV/AIDS by sector have been based largely on assumptions, as there were insufficient data for projections. The collection of

sector-specific data, and sectorally specific monitoring of trends, is to be facilitated by the National Population Unit, with its next Report on the *State of South Africa's Population* (to be published in August/September 2001). Together with that new approach, the Unit will facilitate situation analysis and indicator development research.

At the same time, sectoral intervention must be based on integration and co-ordination. In this context, medium-term planning in public health responses has proved to be limited in organising a national response. Planning cycles should span a minimum of five years, with adjustments and revisions of basic assumptions and conclusions after two to three years, and encompass the activities of all layers of government (both central and local), the private sector, international and national non-governmental organisations as well as community-based organisations.

The Department of Health reports close collaboration with the South African Institute for Medical Research (SAIMR) in STD surveillance and management, and cites evidence of reduction in the incidence and prevalence of STDs in Gauteng (there is no co-ordinated national programme of STD surveillance and management). In co-ordinating the Demographic and Health Survey, the Department works together closely with the Medical Research Council (MRC) and a number of academic institutions. New information is being compiled on the age of sexual activity, and condom use.

The Department of Social Development draws attention to new initiatives and resource allocations in response to the impact of HIV/AIDS. Over 10 000 secondary school teachers have been trained as HIV/AIDS educators, and life skills programmes have been launched across the country. Counselling services, the Department claims, have been strengthened. An inter-ministerial and inter-departmental committee has been established to generate a united government response to HIV/AIDS and to provide financial and technical support to national government departments to initiate work-place programmes.<sup>7</sup> A National Strategic Framework focusing on the rights and needs of children affected and infected by AIDS has also been formulated. In this strategy, the government commits itself to intersectoral collaboration and integrated institutional arrangements at provincial, regional and local levels.<sup>8</sup>

Public Works departments, taking cognisance of the fact that they create only short-term employment opportunities, are beginning to add a human resource/training component to the jobs for which they hire employees, so as to facilitate greater capacity on the part of these employees for mobility on the labour market. This, it is hoped, will mitigate the economic impact of HIV/AIDS faced by enterprises as workers fall ill and die from HIV/AIDS-related conditions, and have to be replaced.

Whilst there is thus evidence of closer integration and co-ordination between government departments and sectors, analysts and policy planners in the academic, consultancy and NGO fields point out that there is a discrepancy between government departments' policy planning and research-cum-activism at other levels. Specifically, there is a perceived lack of formal mechanisms of collaboration and communication.

This failure of collaboration and communication must be viewed all the more seriously, as the broader determinants of health cannot be compartmentalised. Social capital as the bedrock conditioning behavioural responses 'is produced by features of the organisation of our societies and communities which facilitate coordination, cooperation, and reciprocity'.<sup>9</sup> Such social networks provide an informal structure upon which formal citizenship and civic engagement are based.



'The relevance of social capital in... alliances and partnerships for health promotion lies in the fact that one important aspect of the foundation for building social capital is the existence of networks for communication – such networks are fundamental to alliance and partnership building'.<sup>10</sup> Interventions aimed at increasing social support and social cohesion have been found to be cost-effective in lessening the burden of ill health and disease the world over.

## Provincial and local government

Some strong arguments in favour of decentralisation have been made by health systems researchers both locally and internationally. In the case of HIV/AIDS, more specifically, local government has a central role to play. However, the dilemma in South Africa lies in the fact that while local government has constitutional and legal obligations to promote social and economic development and service-provision, the economic and social impact of HIV/AIDS (among other things) has made this an elusive goal. Only very few local authorities have taken up the challenge of HIV/AIDS. They are operating within severe capacity and resource constraints and to some extent depend on national government to take the lead. As a result, they are reluctant to take on functions requiring substantial funding or significant re-allocation of resources or re-deployment of staff. In many cases, they are at a loss when it comes to addressing the epidemic in the day-to-day functions of local government.<sup>11</sup>

Local governments should be equipped to develop or at least identify local AIDS plans, to convene a multisectoral network, and to co-ordinate their efforts with other municipalities, and provincial and national government.<sup>12</sup> Through improved co-ordination, national campaigns could be taken further by local governments, and vice versa. An initiative is currently being explored to develop a toolkit for local government, with accompanying training for councillors and officials (which includes guidelines on data collection, planning, and advocacy).<sup>13</sup>

The breakdown of data between national and provincial level is perceived by researchers and planners as being satisfactory. However, the same cannot be said of the relationship between national, provincial, and city, town, community and household levels, for which no breakdown is currently available.

An area requiring urgent attention is that of the study of the social capital resources and coping mechanisms of households and local groups and communities. It would be important to investigate these at both rural and urban levels. Local government could play a role in integrating HIV prevention and care activities into all its services, and to strengthen socially integrative community responses.

The disparities in the distribution of resources across geographical areas are noted by organisations in developing countries generally. While most programmes providing care to people living with HIV/AIDS have been initiated at local level, they are overwhelmed by the growing need for care. In South Africa, according to estimates from 1992/1993, non-hospital primary care services are largely provided through fixed and mobile clinics, and community health centres. On average, there are about 10 756 people to one clinic. Primary care services nationally employ only 10% of general doctors, 17% of nurses, and 11% of pharmacists.

In the absence of or in the face of under-resourcing of primary health care at local level, many HIV patients are being referred to tertiary health care institutions, thus overburdening the tertiary sector. People with AIDS-related infections tend to come to hospital for treatment in the advanced stages of illness, when they could have been diagnosed and proactively treated at earlier stages, at primary care and

local levels. In addition to individual benefit, primary and local level care could also lessen the burden on the health system. But to create the conditions for the optimal mix of primary, secondary and tertiary care, more research and resources are needed for primary level care. Primary care could be made a more accessible and attractive option through AIDS awareness campaigns. Presently, discrimination against, and stigmatisation of, people living with HIV/AIDS have often had the effect of making people seeking care bypass the local facility to obtain care in another facility where they will not be recognised.

It has been proposed that one way of dealing with this problem is to integrate locally initiated programmes into the systems that deliver other types of health services and decentralise them in order to adequately distribute resources and avoid the situation where tertiary health facilities are over-utilised and local facilities are under-utilised, under-funded and understaffed.

At primary and local level, the surveillance and management of HIV/AIDS-related conditions could be integrated with that of STDs. At the moment, this is beginning to happen in Gauteng Province, but has not yet been implemented in other provinces. The Department of Health is planning to develop an STD programme that will cover the entire country in a co-ordinated way. Research and experience has shown that programmes for the prevention and treatment of STDs could reduce HIV infection rates. This was shown for the early stages of the HIV epidemic by a study in the Mwanza district of Tanzania, where improvements in the quality of STD services contributed to reducing new cases of HIV infection by as much as 40%. A South African study based on an STD prevention programme in the mining sector has shown that even during the rapid growth phase of the HIV epidemic, STD prevention and treatment is highly cost-efficient in relation to HIV/AIDS as well.<sup>14</sup>

For HIV/AIDS-related conditions, local health services potentially offer better follow-up care, home care, and counselling for household members. But their geographical distribution is uneven.<sup>15</sup>

Research on the cost-benefit relation of home-based care and on household impact and household coping mechanisms has been identified as a priority across the spectrum of organisations and government departments surveyed.<sup>16</sup> This is a difficult area to investigate and to target for specific interventions, though. Even before the impact of AIDS made itself felt, historians and social researchers have pointed out that the legacy of colonialism, apartheid, rural impoverishment and migrant labour, has left extended family and community networks weak in comparison to many other African countries. This means that local government structures cannot rely on existing household and community networks for the care of people living with HIV/AIDS. In most cases, the establishment of such networks would have to be encouraged, and where they have emerged through independent initiatives, they would have to be supported. Mindful of the level of social disruption and disintegration, activist researchers point out that home-based care is not an alternative to or substitute for public health care. Home-based care has to be seen as one of several options within a health system, offered in response to specific needs at specific stages and conditions of HIV/AIDS. Without this qualification, there is a danger to pass the entire burden of care onto families already overburdened by poverty, unemployment, and ill health, and onto women and girl-children in particular. Home-based care requires supportive input from the public health, welfare, and education systems. At the moment, the capacity of that support is limited.

Limited also is the expansion of preventive programmes outside of educational, health, and workplace facilities that target specific groups. It has been pointed out that in later phases of the HIV epidemic, risk groups are not narrowly defined

because prevalence levels are too high and too dispersed. Furthermore, concentrating preventive and health-promotive campaigns in existing health and educational institutions only is likely to miss out substantial portions of the population whose lives and social networks are being formed outside of the recognised mechanisms of civil society and the state. Targeting learners at secondary schools, for instance, will miss out those excluded by high failure and drop-out rates. Targeting workers through workplace programmes will miss out those who are unemployed or have become casual workers. Facilities would have to be established where people have access to early HIV diagnoses through voluntary counselling and testing, with intensive education and support.

### Public versus private interventions

It is often assumed that the risk of contracting AIDS is incurred through specific acts or omissions. Nevertheless, there is a case for public intervention in the AIDS epidemic, as a growing proportion of people cannot calculate and voluntarily control their risk of infection (for example, rape survivors, minors, newborns). Equally, within many contexts, choices of sexual activity and practice are largely defined by complex contextual factors that lend themselves to infections occurring. These include poverty, migrancy, lack of availability of resources such as condoms, lack of education, gender relations, amongst others. Over and above the need to integrate analysis of contexts into prevention-related responses, there is also the issue of service and resource provision in the area of treatment and care. It has been pointed out that any rationale against public subsidy fails, as HIV/AIDS, in contrast to other STDs, is not curable and prevention interventions are markedly more cost-effective than the complex consequences of treatment and care provision. In South Africa, with the added fiscal and structural constraints, there are considerable lacunae in public sector response. Instead, it is largely in the private sector that, through the 'managed care' package of medical schemes since 1998, the 'reasonable benefits' of antiretroviral therapy, for example, have been made available.

These provisions mirror and perpetuate the differences in access to health and social services between different social groups. In, 1992/93, 61% of health care was funded from private sources, and nearly 39% of health care expenditure from public sources. Yet, according to a 1994 estimate, the private sector serves only about 23% (maximally) of the population.<sup>17</sup>

### Treatment options, cost-benefit analysis at different levels of care

South African health systems analysts point to the likelihood that a high proportion of episodes of illness could have been treated at primary care facilities if they were accessible and perceived to be of high quality.<sup>18</sup>

While it is generally agreed that the quality of care at the primary care level has to be improved, the complex treatment regimens of HIV/AIDS-related conditions complicate the picture of the ideal relationship of different levels of health care. This relates to the need to research the HIV disease spectrum, morbidity and mortality and related costs. Little is known about patterns of complications, of opportunistic infections and of different stages of HIV/AIDS. Little is also known about the case mix in hospitals. While generalists can provide symptomatic and palliative treatment, relatively few of them have been trained in treating opportunistic infections. Furthermore, the inaccessibility to treatment is not confined to the administering of anti-retroviral drugs; even treatment or prophylaxis for opportunistic infections is in many cases not available.<sup>19</sup>

This underscores the requirement for improved and more sophisticated data collection from a variety of sources. Some research is being conducted on the relative cost involved in providing anti-retroviral therapy, as opposed to treating opportunistic infections, and other treatment options. However, there are not sufficient research data to inform treatment policy and protocols in terms of cost-benefit. Baseline studies as prerequisites of any intervention, and data to calculate the costs of care have been identified by analysts in government and university departments, consulting agencies, and NGOs as a priority. A range of these organisations are presently involved in the analysis of expenditure on the provision of care at different levels and at different stages of HIV/AIDS and different types of HIV/AIDS-related conditions (for example, the Department of Economics, University of Cape Town; Health Economics Research Unit, University of Cape Town; Centre for Health Policy, University of the Witwatersrand; HEARD, University of Natal, Durban; Abt Associates; and the National Treasury). It is agreed that more resources and research need to be dedicated to primary level care, in order to take the burden of more expensive in-patient treatment off the hospitals. Moreover, what is required are drugs for prophylaxis to reduce the impact of opportunistic infections, and to allow people living with HIV to get on with their everyday lives.

A number of studies conducted by the above mentioned organisations focus on the cost-effectiveness of strategies to prevent mother-to-child transmission of HIV.

#### Responses at regional level

Labour migration and other forms of induced migrations are likely to increase with globalisation and labour market flexibilisation, with promotion of regional free trade, and with political conflict and ecological catastrophes. Women migrants are particularly at risk, as they are often employed without protection under social legislation, and experience a lack of autonomy in relation to their employment situation and their intimate relationships. Instability of migrants' social networks, lack of civil and social rights and lack of access to health care are major factors contributing to the risk of the transmission of HIV and other communicable diseases, such as STDs and tuberculosis. Restriction of migrants' access to health and social services in their host countries may ultimately increase their vulnerability to HIV by undermining trust, increasing hostility, and discouraging individuals from seeking counselling and support.<sup>20</sup> Activist researchers note with concern that very little attention has been paid to the economic dangers of ignoring the health needs of these workers, who are currently not included in or covered by public health initiatives, interventions, and monitoring. This highlights the need for regional integration of health services, including preventive and promotive health campaigns, and health monitoring activities.

Mobile populations which have not until recently come under the purview of national or local government health departments and initiatives, include workers in the transport sector – a high risk environment. While infrastructural development brings economic and social benefits, it also potentially facilitates the spread of communicable diseases. Two South African researchers have developed a toolkit for considering HIV/AIDS in development assistance, in which a response for the transport sector is included.<sup>21</sup>

As poles of industrial and infrastructural development recruit labour from within a region, the benefits of greater economic integration will predictably be offset by the costs of increased HIV infection rates in the population.<sup>22</sup> Regional integration is imperative in limiting the risks posed to populations by induced labour migration.

## Areas and issues for further research

From the survey of literature on the government responses to HIV/AIDS presented above, the following areas and issues for research can be identified:

- ❑ development of key HIV/AIDS indicators in relation to government and related institutional response (including, for example, spatial analyses; the role of funding and donor agencies; and the relationship between public and private interventions);
- ❑ monitoring and analysis of the policies and strategies of government vis-a-vis their performance against identified key indicators;
- ❑ economic research on health systems that would optimise the public-private and primary-tertiary mix;
- ❑ economic policy research on social health insurance systems and their implementation within a health system;
- ❑ economic research on ways of strengthening the cost-effectiveness of health interventions and systems as they pertain to a response to HIV/AIDS;
- ❑ studies on cost-effectiveness and feasibility of different available treatment regimens for different HIV/AIDS-related conditions.

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# THE RESPONSE OF SECTORS, FIRMS AND WORKPLACES

## Background

There is not a great deal of literature on the response of firms and sectors to the impact of HIV/AIDS in South Africa. Within the literature that was identified, topics include the following:

- ❑ workplace initiatives in developing countries;
- ❑ corporate planning including legal perspectives, management of occupational exposure;
- ❑ management guidelines and codes;
- ❑ sectorally specific explorations of vulnerability and responses;
- ❑ multisectoral partnerships;
- ❑ partnerships between the private sector and non-governmental organisations;
- ❑ information for companies and employees and trade unions including benefits and social security;
- ❑ planning and policy on HIV/AIDS in the workplace;
- ❑ sectoral studies with a particular emphasis on mining.

A large proportion of the studies covering these issues emanates from international conferences on HIV/AIDS. Other major contributors are UNAIDS, the Department of Health, researchers based in university departments and research institutes. Two journals that are prominent in making contributions to this field are *AIDS Bulletin* and *AIDS Analysis Africa*. Both of these contain short summaries of research work undertaken, or descriptive articles aimed at firms and practitioners, rather than detailed analyses.

Conspicuous by its absence in the South African literature is the response from corporate business, and from business sectors (with the exception of the mining industry, which has been a focus of sociological, epidemiological, and demographic researchers). With the exception of the insurance group, Metropolitan, no contributions on responses from the insurance sector were forthcoming. Such research on the impact and implications of HIV/AIDS that does get commissioned by the business sector, and to some extent by government departments, frequently does not enter the public domain; the products remain company-owned.

Withholding such research has serious drawbacks for the achievement of the goal of an informed public, upon which so much of the success of the campaign to prevent and plan for the impacts of HIV/AIDS depends. A further disadvantage of this trend is that it limits a critical and/or comparative analysis of findings, and furthermore, that in this cloistered world outside of the public domain, planning may be premised on relatively narrow viewpoints.

Research falling into the latter category is presently commissioned and undertaken with much more frequency and rigor, as companies need to include HIV/AIDS projections into their planning and reporting, calculations on productivity, cost of benefits, unit labour costs and into management strategies. As constitutional and legal provisions become actionable, they have to devise business plans, policy and protocol in response to HIV/AIDS. Contributions to, and schedules of benefit schemes, group life and disability premiums, and medical aid schemes are likely to be revisited and revised in line with modeled projections.

## Current research

Such work is presently being undertaken in a general framework by major insurance and investment companies. On the interface between themselves and their clients, shareholders and/or employees, Abt Associates are presently conducting various research projects. Whilst these studies are not undertaken specifically in response to HIV/AIDS, it is clear that the impact of the epidemic has sparked a great deal of restructuring, rescheduling, and reallocation in investment and insurance fields. The studies currently undertaken by Abt Associates include an assessment of the business case for privatising a state run pharmacy benefit management programme; assistance to a private health insurer to develop an internal benchmarking and external reimbursement mechanism; assistance of health insurers to adapt to new minimum benefit regulations; assistance to a large health insurer to understand key cost drivers and to incorporate this information into strategic management.

It appears that health insurers have taken the initiative in strategic planning, followed by Anglo American and Eskom.

## Data and data collection

Specific sectors, especially those which have been shown to be vulnerable to the impact of HIV/AIDS – for example, construction, mining, education, health, public service and administration – are presently initiating, deliberating, and/or embarking on studies, projections and strategic planning. However, this is no simple undertaking. The demographic and econometric models cover only specific sets of data, and to overlay other sets of data on them is extremely problematic. Data collection to date remains insufficiently differentiated and specific. To generate forecasts for specific sectors, the data need to be differentiated between and within sectors, according to certain criteria and indicators. Such research can only be conducted through establishing partnerships between industry/business/government department and several research organisations.

Recognising these shortcomings in data collection, the National Population Unit is to change the format of its annual report on *The State of South Africa's Population*. Researchers with sectoral expertise will be commissioned to submit sectorally specific data whose trends will be monitored over time, with the same set of indicators.

## Sectoral responses

One of the sectors that has been identified as highly vulnerable is transport. Recognising that infrastructural development, while bringing economic and social benefits, can act to facilitate the spread of communicable diseases, the transport sector has been targeted by international organisations as an urgent site for interventions at local, national, regional, and international levels. There is a call to target construction and infrastructure workers on railroads, roads, airlines, shipping; the transport management sector; and passengers. The aim is to reduce mobile groups' and individuals' exposure to risk environments through education, condom distribution, STD treatment, provision of controlled rest areas, reduction of time spent waiting at border posts; and through provision of frequent leave, family accompaniment, and employment of local labour.<sup>1</sup>

The impact of HIV/AIDS has made itself felt in a major way also in the education sector, in terms of the demand for education, the education process, a reduced net inflow into the school system, the increasing number of orphans and young



people out of school, the infection of significant numbers of school graduates and teachers, the reduction in the performance and number of educators, the limited life-expectancy of tertiary graduates.<sup>2</sup> The Health Economics and HIV/AIDS Research Division (HEARD) convened and facilitated a workshop on HIV/AIDS in Education. Plans and strategies that emerged from this workshop included HIV/AIDS awareness-raising in schools, assertiveness training for girls, peer education and counselling, intersectoral collaboration, partnerships in the education sector, co-ordination at all levels – from strategic planning to monitoring and evaluation, planning for loss of teachers and learners, multi-skilling of teachers, action for youth out-of-school, developing an HIV/AIDS manual for education managers, and creating a Southern African database and website.

There is ongoing research at HEARD on the impact of AIDS on education, with special concern for education planning. Methodologies are being developed for educational planning in the HIV/AIDS context. This should inform government about issues such as the number of teachers which should be trained. Another research topic in education pursued by HEARD is the development of early warning systems and indicators.

For rural development, interventions have been called for that would assist vulnerable groups (through, for example, improving women's income earning opportunities, and provision of labour/time saving devices), and provide HIV/AIDS education, and distribution of condoms. Existing rural development programmes would have to be re-oriented, so as to take account of the impact of HIV/AIDS.<sup>3</sup>

## Industry and business responses

UNAIDS has published a report with guidelines for a business response to AIDS, based on what is known about the impact and the lessons learnt. Some of the spin-offs of global systems of production include greater interdependence between larger and smaller businesses and it is argued that these could be used for strategic planning to address the impact of HIV/AIDS. They provide an opportunity for cross-sector collaboration. More concretely, the following measures are outlined that could become part of strategic planning:

- establishment of non-discriminatory practices;
- provision of counselling services;
- education and condom distribution;
- company-provision of HIV/AIDS care programmes, with access to retroviral drugs, regular tests, treatment of opportunistic infections, referral to specialists and treatment centres or hospitals;
- partnerships with governmental organisations and NGO's;
- incorporation of health, social and economic issues for a more strategic and responsive approach;
- assessment of factors at the workplace that could influence HIV transmission: analysis of workplace demographics and workplace demands;
- monitoring of programmes and medical data.

The report lists profiles of business activities in response to HIV/AIDS, among them those of Anglo Coal and Eskom. Eskom has conducted an education, prevention, and monitoring programme over a number of years, and has been widely recognised as a 'best practice' initiative.

There is an interesting trend towards identifying business and workplace initiatives as 'best practices', which carries with it an implicit assumption that 'best practice'

is a clearly defined set of interventions that is applied within a constant framework. It may be that this concept perpetuates an uncritical analysis of the complexity of HIV/AIDS issues in the workplace; it is not necessarily supported by consistent monitoring or analysis. This is illustrated by a recent article on Eskom activities in the *South African Labour Bulletin* which documents the negating effects of conflicts between unions and management (beyond the HIV/AIDS framework) that impinge on the success of such 'best practices'.<sup>4</sup> In addition, there is little research in the public domain that clearly defines, in cost-benefit terms (for example), the usefulness and appropriateness of interventions undertaken. Furthermore, there is a tendency for corporate communications goals (public relations) to subsume open and frank analyses of corporate initiatives. Thus, while company activities in response to HIV/AIDS would have to be encouraged, they would have to be critically assessed and monitored, along with structural constraints and the faultlines of potential conflict and segmentations in the workplace.

Anglo Coal has launched multi-pronged education, prevention and care programmes, providing for treatment of opportunistic infections, counselling for employees and their partners, distribution of condoms, education and life skills development, as well as small business initiatives. The Kriel project is being run in partnership with the University of Zimbabwe, with local authorities, and in conjunction with another mining company.<sup>5</sup>

Other business-initiated projects and programmes actively responding to HIV/AIDS in the workplace in terms of 'best practices' have been documented by the Health Economics and HIV/AIDS Research Division (HEARD) at the University of Natal/Durban. Mondi Kraft, a paper and pulp manufacturing company in KwaZulu-Natal, for instance, launched a training and information campaign. Harmony Gold Mine developed and implemented an STD prevention programme in collaboration with the Department of Health, and two other mining companies. This latter programme provides prophylactic treatment of STDs in commercial sex workers, outreach education, and access to free monthly examinations in a mobile clinic. A reduction of the prevalence of STDs in women, from 50%-15% has been reported. A decrease in STD rates is also noted among the primary partners of the women using the service. Overall, the activities of the project contributed to a 46% decrease in STDs in women and miners and has been assessed as representing a cost saving of R6.8-million to the company.<sup>6</sup>

The rationale for these programmes relies upon, among others, a simple cost-benefit analysis: Early investments in education, prevention campaigns and health care provision, while initially costly, have long term cost-benefits, ie. 3.5-7.5 times more beneficial than the cost of the intervention.<sup>7</sup>

## Guidelines for workplace policies

Some of the internationally developed 'best practices' and other guidelines have been taken further and adapted by local health systems analysts looking at specific sectors of business and industry. They point to the importance of an integrated, co-ordinated approach to HIV-AIDS in the workplace, and to the importance of retaining employees in workplaces as their health condition allows.

South African labour legislation (Employment Equity Act; Labour Relations Act; Occupational Health and Safety Act; Compensation for Occupational Injuries and Diseases Act; Mines Health and Safety Act; and Basic Conditions of Employment Act), legislation pertaining to medical insurance and benefits (Medical Schemes Act), international agreements and codes (International Labour Organisation Convention 111 on Discrimination in Employment and Occupation; SADC Code

on AIDS and Employment), and the Bill of Rights in the Constitution, offer important guidelines on the management of HIV/AIDS in the workplace.<sup>8</sup> A useful resource is the '*Guidelines for developing a workplace policy and programme on HIV/AIDS*' issued by the Department of Health, which translates some of the principles underlying the codes and laws into practical situations at the workplace, with the aim of developing a business policy.

#### Areas and issues for further research

In the survey of the response to the impact of HIV/AIDS on the part of sectors, firms and workplaces, the following research needs could be identified:

- ❑ development of key HIV/AIDS indicators in relation to the response of sectors, firms and workplaces for monitoring and assessment, for the development of policy guidelines, and for co-ordination;
- ❑ monitoring and analysis of the policies and strategies of sectors, firms and workplaces vis-a-vis their performance against identified key indicators;
- ❑ critical economic conceptualisation of 'best practice' approaches and development of techniques to monitor and assess sectoral and workplace practices in relation to HIV/AIDS in the workplace;
- ❑ cost benefit analyses of responses by firms, sectors and workplaces.

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# THE RESPONSE OF NON GOVERNMENTAL ORGANISATIONS, COMMUNITY-BASED ORGANISATIONS AND COMMUNITIES

## Background

HIV/AIDS impacts dramatically on poorer communities, where the social conditions of poverty increase vulnerability to infection, whilst also sapping meagre resources of households engaged in responding to care of the ill and death of productive family members.

The literature in this area includes explorations and appraisals of household and community responses to HIV/AIDS care and support, as well as analyses of external interventions that can mitigate HIV/AIDS impacts.

## Household responses

The economic impact of HIV/AIDS is long term, impacting through the family network and considerably affecting orphaned children. Internal household economies are strained when a person is ill with AIDS, or when a family member dies. The most immediate response is to seek assistance from a 'safety net' of extended family, friends, neighbours, community level organisations and services. Households also mobilise internally to mitigate threats to income generation by making changes to mechanisms for income generation.

At issue is the development of an understanding of general household and community responses to HIV/AIDS, with a view to guiding the development of policies, strategies and interventions that can mitigate impacts at individual, household, community, and consequently regional and country level.

Household strategies for reducing economic risk are outlined by Donahue<sup>1</sup> and include:

- Choosing income-generating activities that are low risk;
- Diversifying crop production and income-generating activities;
- Building up insurance mechanisms including savings, assets, and preserving extended family and community ties.

Household stability can be negatively impacted in cases of severe loss, where productive assets may have to be sold, or children withdraw from schooling to manage aspects of the household.

UNAIDS<sup>2</sup> categorise a number of household coping strategies including:

- Substituting cheaper commodities;
- Reducing consumption;
- Sending children to live with relatives;
- Replacing food items with indigenous vegetables;
- Begging.

At a further level these strategies extend to income diversification, migration in search of new jobs, loans, sale of assets, and use of savings. Loss of labour is alleviated by intra-household labour reallocation, removing children from school, expanding access to labour and diversifying income sources. It is suggested that these adaptations are often experimental, and may be nuanced in households which repeatedly deal with illness and death. The worst-case scenario is

destitution, where households depend on charity, or break up or household members migrate.

Such responses at household level, whilst relevant and related to HIV/AIDS, are also generally typical in response to other 'shocks', including, for example, natural shocks such as crop failure, drought or flooding; health related shocks such as illness or disability; or macro level phenomena such as land expropriation or war.

Although various authors have explicitly identified these issues, few research studies clearly identify the direct HIV/AIDS-related causal aspects of income loss. At best, Caldwell, et al,<sup>3</sup> identify loss of labour, loss of urban remittances, additional expenditure on medicines (both modern and traditional), whilst other authors refer to funeral and burial costs.

In terms of interventions, it is suggested that planners focus on building the economic resources of households and on supporting the creation of community level safety nets. 'When families who are poor (but not destitute) are given economic support before they are hit with the worst effects of HIV/AIDS, they are often able to slow their economic descent and buy themselves enough time to devise adequate coping strategies'.<sup>4</sup>

UNAIDS<sup>5</sup> suggest that policy options include increased support to agricultural production, expanding income generation opportunities, reducing demands on women's labour, and improving the welfare of children, amongst other conventional poverty alleviation mechanisms.

The international and developing country literature is extremely limited with regard to urban and peri-urban contexts, and industrial settings, focusing largely instead on rural communities and rural economic activities. In South Africa in particular, a high proportion of urban contexts prevail, and these are distinctly different in terms of economic circumstances, resources and community contexts.

South African literature related to economic responses of South African households to HIV/AIDS could not be identified. However, a useful overview of general health responses is provided by Goudge and Govender<sup>6</sup> who review experiences of household abilities to cope with the resource demands of ill health and healthcare utilisation. They also note limitations in HIV/AIDS specific literature and affirm that articles tend to be 'mostly descriptive, quantifying or outlining the impacts, with little analysis'.<sup>7</sup> In general there was very little international literature that reported direct research on HIV/AIDS related specifically studied household responses.

It is important to note that given the relatively poor access to voluntary counselling and testing (VCT) programmes in South Africa, the vast proportion of individuals infected with HIV do not know they are infected. This affects forward planning by families, who may not readily accept that an ill family member has a terminal illness, and many households may misdirect health care expenditure in the light of this. Studies that relate to understanding community levels of HIV infection, as well as the availability and relative integration of VCT programmes should be seen as a starting point to understanding household response and this aspect is therefore an urgent research need.

## Community responses

Community responses relate largely to provision of support in mitigating household impacts. Interestingly, the UNAIDS<sup>8</sup> review concludes that family and community groups such as savings clubs and burial societies account for 90% of support provided, with only 10% being provided by NGOs and other agencies.

Community responses are located in three main areas:<sup>9</sup>

- ❑ Support and mitigation – including social support groups, self-help groups, savings clubs, microfinance activities and income generation projects;
- ❑ Treatment and care – including patient care, psychological support and child care;
- ❑ Cultural responses – including protection of property rights, shortening of mourning periods, changing funeral practices, gender roles and HIV risk related sexual and traditional practices.

## Support and mitigation

### **Social support and self-help groups**

In Côte d'Ivoire, for example, self help groups were created in 1994 to provide for mutual support between people living with HIV/AIDS (PWAs), providing assistance in family dialogue, promoting HIV prevention, supplementing health care workers, and lobbying. The emergence of such groups is contingent on individuals being able to assess their own HIV status, and incorporates activities at community level that promote destigmatisation and openness.

Internationally there are various networks of PWAs including the National Association of People Living with HIV/AIDS (NAPWA) in South Africa. Of research interest in South Africa would be cost effectiveness analyses of support provision to community level activities, analysis of provincial and national formations that incorporate PWA membership and those that provide support to PWAs. Of particular interest is the upscaling of such initiatives.

### **Savings clubs**

Savings clubs and schemes can help households that have unstable income patterns and are thus unsuited to credit schemes. Helping such households build savings allows for reduction of economic risks, and for coping in times of crisis. Grassroots social security systems are a widespread phenomenon and include social support groups such as burial societies, grain savings schemes and labour sharing clubs, as well as savings clubs which involve rotating savings and credit. UNAIDS<sup>10</sup> cites various examples of spontaneous development of AIDS foci within conventional savings clubs. These include Tanzanian savings clubs which specifically targeted HIV/AIDS costs though assisting with money, food, fuel, labour and other items to assist those who were ill, assisting with burial costs and supporting subsequent income-generation activities. Similarly, in Zimbabwe, women's groups have been active in taking care of children.

In general, however, little research has been conducted into the existence or potentials of savings clubs that are specifically associated with responding to HIV/AIDS.

### **Microfinance activities**

Various authors explore microfinance programmes as a strategy for building household resources. Overviews are provided by UNICEF,<sup>11</sup> Donahue,<sup>12</sup> and Parker.<sup>12</sup> UNICEF<sup>14</sup> describe the linking of microcredit systems to basic social service provision, whereby health and nutrition, school enrolment, and safe water and sanitation use is broadened. Microcredit can also be linked to savings and group-based lending schemes. 'Experience with microcredit has shown that the poor can be disciplined borrowers and savers, able to repay loans on time and to

save. If poor families are able to pull themselves out of poverty, they need access to the successive loans that microcredit programmes provide'.<sup>15</sup> Microcredit programmes can be funded by donors, United Nations agencies, financial institutions and governments and can be managed by non-governmental organisations and socially inclined financial institutions.

Donahue and Parker both argue for the targeting of microfinance clients from an HIV/AIDS perspective, although not necessarily explicitly. The rationale against explicit targeting relates to stigmatisation of clients, and in many contexts knowledge of HIV status by those affected and infected is not a given. Formations may, however, exist that are explicitly linked to HIV/AIDS, such as PWA organisations or support groups, and these could be explicitly targeted. Donahue suggests that targeting could be oriented contextually – ie. in areas of high HIV and AIDS incidence.

Microfinance approaches include a 'built-in mandate to scale up operations in order to achieve self-sufficiency',<sup>16</sup> with potentials for longer term sustainability and growth. It is suggested that innovations and services supportive to HIV/AIDS could include smaller short-term loans, health insurance, partnering with health institutions, and more direct assistance in terms of financial advice. In essence, the points made relate to microfinance institutions being HIV/AIDS aware, and proactive with regard to assisting household matters related to illness of a productive family member. This discussion is expanded by Parker<sup>17</sup> who suggests innovations such as allowing other well adults in a household to replace a sick microfinance client, creating small loan programmes for families, developing pre-paid medical products to offset future costs, and providing insurance for burial costs or other debts. Non-financial services such as developing orphan care programmes, health care provision, legal advice and assistance, and rights training are also suggested.

Donahue<sup>18</sup> suggests that programmes targetting households should incorporate microcredit, savings mobilisation and improvements in market linkages with a view to mitigating HIV/AIDS. Specifically:

- Maintaining or increasing income flows to poor households, which improve food security;
- Providing households with an opportunity to acquire secure, stable savings;
- Enabling households to avoid irreversible coping strategies (ie. those that lead to destitution); and
- Enabling households to share resources at community level.

No South Africa specific literature that linked microfinance and HIV/AIDS was identified and potentials thus exist in South Africa for review of potential roles that microfinance institutions and group-based savings schemes could play in regard to HIV/AIDS. Additionally, pilot interventions could be developed and evaluated in communities with high incidence levels.

### **Income-generation projects**

Income generation projects have tended to emerge as part of broader poverty relief strategies, although there are a number of examples of HIV/AIDS orientations. These tend to involve small-scale microenterprise activities including manufacturing, agriculture, service provision and petty trading, and may incorporate credit and savings schemes. Broader activities can include building market linkages, both in terms of sale of products, and in terms of accessing raw materials more economically. These can take place at individual or at community level.

There was very little data available that provided deeper insight into community-level programmes. A few small scale initiatives are described in papers delivered at the 12<sup>th</sup> and 13<sup>th</sup> International AIDS Conferences, including, for example, projects focusing on HIV positive women in Kenya, work with widows in Kenya, and hospital-based projects in Jakarta.

In South Africa there are clear implications for policy and strategy development in this area, as well as an urgent need for further research to inform specific directed activities.

### **Treatment and home-based care programmes**

Home-based care programmes are rapidly emerging in communities where there are high incidences of HIV/AIDS. This growth has also been particularly apparent in central and southern African countries in communities where illness and death rates are high. The first response related to HIV/AIDS care is at the level of health service provision, which generally devolves to home-based visits by conventionally trained health workers, and then to community-based initiatives. Programmes include 'medical and nursing care, material assistance, as well as emotional, spiritual and social support'.<sup>19</sup> Key literature in this area includes good overviews by UNAIDS and Sanei.<sup>20</sup> A number of studies were described and reviewed at the 13<sup>th</sup> International AIDS Conference in Durban, and there are a number of relevant South African texts. These include descriptions of interventions in Carletonville, Kalafong Hospital in Pretoria, and a rapid appraisal of community-based HIV/AIDS care and support programmes by Health Systems Trust (HST). HST has also published an overview of policy issues related to Community Health Workers (CHWs), and also an economic analysis of CHW programmes in the Western Cape.

In their rapid appraisal of HIV/AIDS care and support programmes in South Africa, Russell and Schneider identified benefits to households and the health service. These include:<sup>21</sup>

- Reduced incidence of hospitalisation and hospital stay;
- Reduced burden on primary health care as a result of improved awareness of minor illnesses, nutrition and general wellness advice;
- Increased support to family members, and better disease management;
- Reduced costs to the family;
- Increased awareness, leading to acceptance and risk behaviour reduction;
- Decreased isolation of the PWA family;
- Increased drug compliance; and
- Potential for monitoring through links between the hospital and home.

They point to contradictory information about relative costs between hospital initiated and community-initiated home-based care programmes, and there is clearly a need for better understanding of cost-benefits of each approach. Programmes that reduce hospital and clinical care requirements do, however, also have the benefit of ensuring that these services are not overwhelmed by HIV/AIDS cases, to the detriment of other health problems.

Their rapid appraisal was not able to provide an overall indication of the availability of home-based care programmes throughout South Africa, but they were able to categorise types of programmes. These included:

- Funding, technical assistance and support programmes;
- Advocacy and community mobilisation programmes;



- ❑ Drop-in centres and support programmes with support groups and income-generation components;
- ❑ Community-based programmes with some home visit component; and
- ❑ Comprehensive home-based care programmes that typically include nursing care.

In general, emerging research and implementation requirements include provision of technical assistance and capacity building; definition of the role of government; promotion of networking; and, developing guidelines and evaluation systems.

Another aspect of care provision is that of formalised approaches through CHWs. Health Systems Trust has published two key South African texts on CHWs – an overview of CHWs in South Africa, and an economic analysis of CHW programmes in the Western Cape. CHWs are community members who serve and respond to health needs in communities. They provide an important complementary role to often inadequate conventional health services in poor communities, and given their integration into the community, have potential to address causal aspects of health as well. CHWs link community members to resources and services, promote health awareness, assist in identifying and treating minor illnesses, and refer and/or service chronic illnesses.

In the context of increasing needs for palliative care related to HIV/AIDS, the funding of expanded CHW programmes is imperative. Funding sources are typically through government or NGOs, and incorporate provision for training, equipment, and recurrent costs. Some programmes incorporate voluntarism, but this is often difficult to sustain in already poor communities.

Current research indicates that there are varying models for CHW implementation. Further research, is however required in terms of developing standardised guidelines and funding models for a rapid, nationally co-ordinated response. Of particular importance would be a review of potentials for linking CHW programmes into existing formal health infrastructures and systems, and also, of focusing CHW programmes specifically on HIV/AIDS and related aspects such as sexually transmitted disease and tuberculosis treatment. CHWs can also be involved in identifying needs related to child and orphan care.

Schapink et al, provide interesting developmental viewpoints in their 'Strategy to involve rural workers in the fight against HIV/AIDS through community mobilisation programmes'.<sup>22</sup> This approach argues for *integration* of all prevention and mitigation activities at community level through a review of *cost-benefits* and *upscaling* potential.

## Child and orphan care

A long-term legacy of HIV/AIDS is growth in the number of children who lose one or more parents or caregivers to AIDS. This loss has dire consequences including psychological impacts, malnutrition, reduced health care, withdrawal from schooling, child labour, homelessness, vagrancy and crime. Communities do tend to mobilise around the AIDS orphan issue, but strategic interventions are required to ensure appropriate, sustainable response. Hunter and Williamson<sup>23</sup> identify five basic interventions:

- ❑ Strengthening the capacity of families to cope;
- ❑ Stimulating and strengthening community-based responses;
- ❑ Ensuring that governments protect the most vulnerable children;
- ❑ Building the capacities of children to support themselves; and

- ❑ Creating an enabling environment for the development of appropriate responses.

UNICEF and UNAIDS<sup>24</sup> provide an overview of national interventions. These include policy review of child laws, development of social services models, provision of orphan care services, establishment of orphan trusts, specific emphasis on younger children, strengthening community responses, and emphasising education and lifeskills. A general trend has been to utilise existing and emerging formations and infrastructure, and institutionalised facilities such as orphanages are considered inappropriate within these contexts. Williamson<sup>25</sup> notes that 'child development specialists have recognised for decades that institutional care generally fails to meet many of children's developmental needs, such as those for attachment, social integration and acculturation'.

Williamson, provides a useful conceptual overview and makes reference to the FOCUS programme in Zimbabwe, the Orphans and Vulnerable Children's (OVC) committees in Zambia, and the COPE programme in Malawi.

Numerous presentations related to HIV/AIDS orphan care were made at the 13<sup>th</sup> and previous international AIDS conferences, although few focus on economic or governance aspects of the response. A conference on 'Raising the Orphan Generation', held in Pietermaritzburg in 1998, also provided insights into Southern African perspectives, and there are growing numbers of non governmental and community based organisations emerging in South Africa that integrate orphans into their activities, or that focus on orphans specifically. Networks include the Children's HIV/AIDS Network (CHAiN) in the Western Cape and Children in Distress (CINDI), in KwaZulu-Natal.

There are a complex of activities that assist and support children orphaned by HIV/AIDS. Given that children are most vulnerable and least empowered in the context of HIV/AIDS, responses at this level require fast-track, cost-effective strategic interventions. Over and above activities identified in previous sections related to household and community support, orphan specific activities include, amongst others:

- ❑ Enumerating orphans and assessing needs;
- ❑ Monitoring vulnerable children and families;
- ❑ Providing direct assistance to affected orphans;
- ❑ Changing requirements for school fees and health facility costs;
- ❑ Training teachers, health workers, community members and other service providers in key aspects of orphan monitoring and care; and
- ❑ Providing training and support to elder children who support their siblings, and/or who head households;

Appropriate and fast-track policy making is of particular import. This includes:

- ❑ Clearly identifying priorities;
- ❑ Explicitly providing economic support to orphan programmes;
- ❑ Noting and addressing issues of gender inequality and the disproportionate burdens placed on women;
- ❑ Entrenching property and inheritance rights, and ensuring that gender discrimination is not enshrined in statutory law or practice; and
- ❑ Monitoring and aggressively mobilising against child labour.

The response to HIV/AIDS orphans is intertwined with responses at household and community level. However, it is also the issue most needy of fast-track strategic intervention and policy-making. HEARD at Natal University is conducting research into costs involved in six discrete models of orphan care, including analysis of the

quality of care provided in examples of each of the care models. In general, however, there is little South African research that examines the issue of HIV/AIDS orphans, nor the economic aspects of responses to orphans.

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# THE RESPONSE OF TREATMENT AND CARE

## Background

The South African National Government's Department of Health has made it clear that antiretroviral (ARV) therapy is not available in the public sector, and that prevention of vertical (mother to child) infection will not be carried out until further research results on the antiviral drug nevirapine are available. Likewise, 'access to more sophisticated diagnostic tests (such as CD4+ lymphocyte counts) will generally not be available at primary care clinic level. ... The CD4+ T-cell count is a measure of the extent to which HIV-induced immune damage has already occurred. Although CD4+ T-cell counts are helpful, they are not required to be able to manage people living with HIV/AIDS at the primary health care level. Laboratory tests that measure plasma HIV RNA levels (viral loads) indicate the magnitude of HIV replication. Higher levels of circulating virus lead to more rapid CD4+ T-cell destruction. Viral load tests are expensive and are not required unless a patient has access to antiretroviral therapy'.<sup>1</sup>

These decisions by the Department of Health have sparked a great deal of controversy, and are being contested by the Treatment Action Campaign. The decision to withhold Nevirapine in the treatment of MTCT has caused an outcry amongst AIDS activists, medical practitioners, people living with HIV/AIDS, the media, and NGO's dealing with the impact of HIV/AIDS. Doctors at various primary health care clinics and other treatment centres in the Western Cape have defied the ban on antiretroviral treatment of HIV-infected pregnant mothers.

More recently, the government responded cautiously to a deal brokered by five multinational pharmaceutical companies and several UN agencies that would offer cheaper drugs to treat HIV/AIDS in developing countries. The minister of health has stated that she was continuing to explore the possibility of compulsory licensing and parallel imports of medicines to make cheaper antiretroviral drugs available in South Africa. This is theoretically possible under South African legislation and under World Trade Organisation agreements: interested parties can apply to court to allow manufacturers of generic medicines to have the respective drugs licensed. Research conducted under the auspices of UNAIDS has shown that where generic competition has been allowed, drug prices have fallen by an average of 80%. Where there is no such competition, prices have dropped by less than 20%. Moreover, parallel imports would allow the importation of cheaper drugs from elsewhere in the world.

However, recent calculations by the Centre for Health Policy at the University of the Witwatersrand have shown that even if the costs of triple combination antiretroviral therapy were reduced to one quarter of current levels, this would still require a more than 50% real increase in the public health budget by 2010. Budget constraints would not allow the state health care system to shoulder any more than marginal extra costs. Given the fact that low income earners have to rely on public health services, the reduction of prices for antiretroviral drugs would make little difference to most poor people.<sup>2</sup>

One of the reasons for government's cautious attitude lies in the fact that the price of drugs is only one factor in the cost of treatment. Treatment, in addition requires testing, counselling and monitoring. However, the national government's reasons do not rest solely with cost concerns; the pronouncements of the minister of health and the state president express doubts about the safety and efficacy of antiretroviral drugs. Thus, it has been pointed out that 'the government is

probably right about the secondary importance of antiretrovirals, but for the wrong reasons'.<sup>3</sup>

The national health department's policy not to make ARV therapy available in public health services, has shaped the current research priorities. The priorities in the research as it pertains to conditions of high seroprevalence, a high degree of inequality in relation to affordability and accessibility of health care, and great differentials in resource allocation in South Africa have been set in line with the objectives including:

- ❑ to reach sufficiently reliable and conclusive results to justify the use of nevirapine in HIV-infected pregnant women;
- ❑ to urgently study the results of mother to child transmission of HIV (MTCT) through breastfeeding, so as to be able to advise mothers on infant feeding options;
- ❑ to step up interventions in the prevention and treatment of opportunistic infections;
- ❑ to reduce the prevalence of sexually transmitted diseases as an intervention directly influencing the transmission rate of HIV;
- ❑ to prevent and control the incidence of tuberculosis in HIV positive persons as a way of curbing the incidence of TB in the general population (TB still being a major killer in South Africa);
- ❑ to develop cost-effective programmes and interventions to guide budget re-allocations to address the imbalances in public and private health care provision, in the relation between primary and tertiary care
- ❑ to equip primary health care providers with knowledge, resources, and additional personnel to be able to provide for the majority of HIV-related conditions at primary level.

#### Cost-effectiveness: primary care and prevention strategies

Cost-effectiveness analysis can be used to identify efficient strategies and methods of implementation by comparing costs and consequences of alternative activities. Cost-effectiveness analysis can provide answers to questions as to which type or combination of services provide the best value from the budget available, and guide resource allocation within the competing needs of AIDS programmes.<sup>4</sup> In relation to HIV/AIDS specifically, cost-effectiveness analyses would have to take account of:<sup>5</sup>

- ❑ level of health sector expenditures related to AIDS, and how they are divided up by use of funds (prevention, treatment, mitigation) and source of financing (public, private, donor);
- ❑ relation of AIDS expenditures to overall health expenditures by use and source of funds;
- ❑ determinants of level and pattern of expenditures and financing.

In South Africa, with huge imbalances in resource allocation and in different levels of health care provision, this could be an important tool in health care reform, especially with regard to dealing with the impact of HIV/AIDS.

The Department of Health considers primary care as the most convenient and cost-effective level of care for the individual and the family concerned. Guidelines have been developed for the treatment of TB, opportunistic infections, pneumonia, viral, fungal and bacterial infections and other HIV-related conditions in a primary setting.

More cost-effective, but in some cases difficult to measure in terms of outcomes, are prevention strategies, including the following:

- testing
- use of mass media
- AIDS education in schools
- social marketing of condoms
- treatment of STDs
- commercial sex worker peer education
- voluntary counselling and testing
- prevention activities among injecting drug users
- prevention of mother-to-child transmission

### Voluntary counselling and testing

The benefits of voluntary counselling and testing (VCT) are controversial and fear and stigmatisation are still big factors. Because of the emphasis on personal counselling, it is said, VCT is very expensive. It has been suggested that those who come forward for VCT may be a special group, who could possibly be reached by other, less costly means. There are mixed results for the impact of VCT on risky behaviour. On the other side, studies from Rwanda and from the AIDS Information Centre in Uganda showed increases in reported condom use, associated with VCT. In Uganda, widespread low-cost VCT provision with high-quality post-test support services is thought to have contributed to the stabilisation of HIV-1 prevalence. Studies conducted in Kenya and Tanzania have conclusively shown the high degree of cost-effectiveness of VCT in reducing HIV transmission in those countries, especially in urban settings.<sup>6</sup>

At the moment, rapid tests are being developed (one of which is currently being tested by the Department of Health) that could replace the widely used ELISA. This means that people tested and counselled can obtain their results on the same day. While not obviating the requirement of counselling, this may increase the effectiveness of VCT (UNAIDS: Costing Guidelines for AIDS Prevention Strategies). Early detection of HIV allows for better planning, and possibly for informing of partners. It may also improve medical and psycho-social support for HIV-infected individuals.

In South Africa, an added benefit of establishing more VCT centres would be the possibility of expanding the data and the set of indicators, which at present are too limited to allow for projections and targeted interventions.

### HIV and other STDs

STDs can facilitate the transmission of HIV, particularly in the case of infections where there is genital ulceration. Treatment of STDs should be a high priority as a means of reducing the risk of HIV transmission, as well as curing the STDs themselves and preventing their further transmission. A study in the Mwanza district of Tanzania has shown that improved STD services could reduce new cases of HIV infection by 40%.

### Opportunistic infections and TB

The spectrum of opportunistic infections (OIs) varies among regions of the world; different OIs seem to be prevalent in different parts of the world. Research is

needed to determine the spectrum of OIs and the efficacy of various prevention measures in resource-poor countries.

TB is the most common serious OI in sub-Saharan Africa. In South Africa, the Western Cape Province has a very high prevalence rate. Prevention of TB in HIV-infected persons can be expected to reduce the impact of TB in non-HIV infected populations as well.

A basic standard of care for TB in HIV-infected persons in developing countries could involve relatively inexpensive interventions, such as TMP/SMX, INH, and pneumococcal vaccinations.<sup>7</sup> However, caution is necessary with vaccination. Children especially are at great risk of contracting TB. There is concern that TB infection might be missed and management jeopardised if prophylactic therapy is used.

### Feasibility of anti-retroviral therapy for prevention of vertical transmission

While the South African national government's health department has ruled the provision of ARV therapy in public sector health services as unjustified by standards of cost-benefit and cost-effectiveness, the same argument cannot be adduced for the prevention of MTCT by means of antiretroviral therapy. With Nevirapine in particular, a recent studies show that a short course regimen of a single 200mg oral dose given to women at onset of labour and a 2mg/kg dose given to neonates within 72 hours of birth, reduced the transmission rate by at least 47%, from 28% to 13.1%. Key issues affecting costs are the price of drugs, HIV prevalence (as this has a high impact on unit cost, thus on cost effectiveness), acceptability of treatment and hence compliance, and secondary effects (if any), as well as subsequent compliance with infant feeding guidelines. In South Africa, it has been shown that the most cost-effective option (among ARV treatments, and as compared to the cost of 'doing nothing') is Nevirapine. A study quantifying the cost of each HIV positive child to the state in terms of 'unrecoverable' cost is on average R17 158. This cost is compared to saving that child using a number of interventions:

- AZT (Zidovudine: CDC two week regimen);
- AZT 012 (Zidovudine: CDC two week regimen) and formula feeding;
- Nevirapine and appropriate infant feeding.

In all cases, the study found that it was less expensive to intervene than not to intervene. Among the women in the programme, the perinatal transmission rate is said to be likely to drop from between 31.6% and 25% to between 18% and 16.5%.

The basic total cost of caring for all HIV positive children likely to be born in South Africa without intervention is estimated at 0.49% of total government health expenditure for 2000/2001. This is contrasted with the total cost of a Nevirapine MTCT programme that would amount to 0.28% of total government health expenditure for 2000/2001. Another South African study confirms that a short course of AZT/3TC or a short course of CDC are most cost-effective.<sup>8</sup> This in turn is confirmed by the Thai study in which a short course of ARV therapy reduced vertical transmission by 50% among non-breastfed babies.

These figures rely on an important assumption: namely that all the interventions suggested can be implemented within the existing health structure.<sup>9</sup> This is independently confirmed by a study on the feasibility of using ARV treatment to prevent vertical transmission in Cambodia. This study does not recommend to enlarge the ARV treatment programme to areas where initial investment in training and equipment of testing for HIV has not yet taken place, as this would be very costly. Where this investment has been made, however, running pilot

projects in selected locations is feasible.<sup>10</sup> Another study on cost-effectiveness of prevention of mother to child HIV transmission in Kerala, India points out that an effective policy of prevention of vertical transmission can only be carried out where it can be integrated into existing health systems, so that only incremental costs are incurred.<sup>11</sup>

The feasibility and safety of the use of Nevirapine to prevent vertical transmission is increasingly receiving support from scientists, managers of national AIDS control programmes, HIV-positive mothers, NGO's, and United Nations agencies. A convention comprising participants from these groups was recently held under the auspices of UNAIDS/UNICEF/UNFPA/WHO Interagency Task Team on the prevention of Mother-to-Child transmission of HIV in mid-October 2000. The technical consultation took note of the fact that the safety of preventive treatments including Zidovudine alone, Zidovudine and Lamivudine, and Nevirapine, has been studied extensively for breastfeeding and non-breastfeeding populations worldwide. These treatments decrease the viral load in the mother, and act prophylactically in the case of the infant during and after exposure to the virus. The consultation set about revisiting and revising an earlier recommendation issued in March 2000. This recommendation had stated that because of possible concerns about rapid development of Nevirapine-resistant virus in women making use of this treatment, nevirapine should be used within the context of pilot and research projects only. This was also the position taken by the South African Medicines Control Council.

This position is now challenged by new guidelines. Virus resistant to antiretroviral drug regimens that do not fully suppress viral replication (such as those including Lamivudine and Nevirapine), may develop quickly and virus may remain present in an individual in very low levels, which could reduce the effectiveness of future antiretroviral treatment for the mother. However, the technical consultation concluded that the benefit of decreasing MTCT with these antiretroviral drug prophylaxis regimens greatly outweighs any theoretical concerns related to development of drug resistance. These theoretical concerns, it was decided, can no longer dictate policy in the face of the fact that every year, more than 600 000 infants worldwide become infected with HIV, most of them in developing countries. MTCT is responsible for more than 90% of infections of children with HIV. According to the technical consultation, the prevention of MTCT of HIV should be included in the minimum standard package of care for HIV positive women and their children. It concluded that there is no justification to restrict the use of any of these regimens to pilot projects or research settings.<sup>12</sup>

## MTCT and infant feeding

The success of any possible ARV treatment to prevent vertical transmission is secondarily conditioned by infant feeding practices. To date, there are different research results. The earlier results show that breastfeeding, while the best source of nutrition for the infant, poses additional risk of HIV infection of the baby of an infected mother. More recent research findings modify this result. It was found, on the basis of a more differentiated research design, that exclusively breastfed babies are less likely to be infected at three months than those receiving mixed feeding or those never breastfed.<sup>13</sup> This indicates the possibility that the virus acquired during delivery could have been neutralised by immune factors present in breastmilk but not in formula feeds.<sup>14</sup> From this, some new guidelines are emerging. If breastfeeding is advised, then it should be done only for the first three months of the infant's life, and without any supplements. Early and abrupt weaning is advised at the end of the first three months. Further research is urgently required to confirm or elucidate these findings. It is premature to base public health



guidelines on the results of this one study. In addition, the role of breast health, mastitis, cracked nipples infant attachment and other variables need to be investigated, as does the infant's susceptibility to infection.<sup>15</sup>

#### Example of effective prevention strategies within a comprehensive, co-ordinated health care delivery system

A good example of the emphasis on preventive strategies within a comprehensive co-ordinated health system are provided by Thailand, where almost 75% of public funds are devoted to prevention. This portion is mostly from domestic, i.e. public sources, indicating a high political commitment to prevention – preventive services are recognised as public goods with positive externalities. Treatment expenditure is comparatively low because of the effect of preventive strategies. At the same time, ARV treatment is being made available to pregnant women, AIDS patients are admitted to infectious diseases hospitals. The policy is one of the rational use of AVR therapy. ARV treatment regimens have been institutionalised in guidelines that are reviewed two or three times a year.

In the northern provinces, community and family-based health care is now an extension of the primary health care system. Home-based care is similar in size to the cost of inpatient care in care facilities. Day care wards are required to be linked with community-based care facilities. They all receive government funding.<sup>16</sup>

#### Response of private health sector

In South Africa, the private/public sector mix in health care needs to be restructured. A number of organisations are working on health policy and the financing of health care, including the Health Economics Research Unit at the University of Cape Town, and the Centre for Health Policy at Wits University.

On the whole, however, there is little research support to guide government allocation of resources in different areas and sectors.

Medical aid schemes have responded to the impact of HIV/AIDS with new managed access to reasonable benefits for doctors treating and patients suffering from AIDS-related conditions. However, this applies only to the private sector. The new provisions mean that ARV therapy and prophylactic drugs should reduce hospitalisation costs due to opportunistic infections and other AIDS-related conditions. This programme, called 'Aid for AIDS', was launched by the Pharmaceutical Benefit Management, an independent managed health care company, in May 1998. Manufacturers agreed to supply dispensing doctors and pharmacies directly with antiretroviral drugs at the best prices on the market.<sup>17</sup>

Abt Associates are presently working on several projects related to the financing of health care through benefit management programmes and private health insurers.

#### Vaccine development

It is big international pharmaceutical companies that usually spearhead vaccine development, but in recent years, they have shown themselves to be hesitant in spending large sums on HIV vaccine development. The reason for this hesitancy possibly lies in the fact that it is the resource-poor countries with high HIV prevalence rates that would constitute the market for these vaccines. Instituting differential prices between industrialised and developing countries, it is feared, would create an uncontrolled 'grey market'. In addition, legal liability could incur companies expensive law suits and hostile publicity.

In the face of this dilemma, international donors have been approached to financially back vaccine development. International partnerships have been pursued. The International AIDS Vaccine Initiative for instance has announced two new vaccine development projects based on partnerships between Oxford University and Nairobi University, and between the US company Alphavax and the University of Cape Town.<sup>18</sup>

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# BEHAVIOURAL AND SOCIAL RESPONSE

## Background

There are a number of large-scale national programmes that aim at behavioural prevention and social mobilisation including Soul City, Love Life, and the Beyond Awareness Campaign. However, there is no research-based overview of programmes involved in behaviour change promotion and social mobilisation, nor their activities and methodologies employed.

Although some of these organisations are involved in ongoing formative and summative evaluation of their own programmes, there is no research which compares the effectiveness of different programmes and there is little national data which can be used as a baseline for understanding behaviour change. This is symptomatic of a lack of a research tradition of behavioural interventions in South Africa and the lack of significant involvement of behavioural scientists in HIV/AIDS. This lack of data contributes to a limited capacity to understand the cost benefits of socio-behavioural interventions.

## Behavioural and social response

To date there is no national behavioural surveillance programme in South Africa.

The 1998 Demographic and Health Survey provides some data on women and youth knowledge, attitudes and practices relating to prevention behaviours including the number of sexual partners in the last twelve months and prevalence of the use of condoms. This is the only population based study which includes behavioural data disaggregated by meaningful demographic categories, including age, education, residence and marital status. Apart from a sentinel site study of youth response to HIV/AIDS across six sites in South Africa<sup>1</sup> and a survey of reproductive health issues among urban black youth,<sup>2</sup> there appears to be little cross-contextual data giving any indication of behavioural response to HIV/AIDS.

There have been many once off, *ad hoc* evaluations of behavioural response to HIV/AIDS. Usually referred to as KAP (knowledge, attitudes and practices – sometimes with the addition of beliefs – thus KABP) these have been conducted by a wide range of researchers, often as the basis of Master's and PhD theses. There have also been many KAP-type studies conducted as part of programme evaluations or baseline studies. Most of these studies are not in the public domain, and a comprehensive review of the literature and findings in this area does not exist, although a review by Attawell in 1998 provides insight into the main studies and their outcomes.<sup>3</sup> An inventory of the main indicators used for measuring behavioural change shows a remarkable lack of consistency with respect to indicators and measures of behavioural change. Also there has been little attempt to systematise behavioural research in South Africa in terms of methods.

There is clearly a need to take stock of the range of studies that exist and to collate the findings in the interest of deriving an understanding of national trends. It has been mentioned above in discussing demographic modelling, that an understanding of behaviour change is important for understanding the social factors driving epidemiology, and sound, systematic behavioural data would be important for modelling of future trends.

A wide range of behavioural data would need to be included if risk exposure and changes in risk exposure are to be validly measured. These include data on:

condom use, sex frequency, types of sexual acts performed, partner turnover, concurrent partners, use of commercial sex services, age differentials between sexual partners, age of sexual debut, sexual coercion, and primary and secondary abstinence.

Not only is there a need for common indicators for measuring behavioural response, but there is a need for agreement about the biographical data that is necessary in order to disaggregate data into categories which are epidemiologically meaningful and which are meaningful categories for prevention.

UNAIDS<sup>4</sup> have developed guidelines for monitoring and evaluation of national AIDS programmes, and also guidelines for second generation surveillance.<sup>5</sup> These are useful but need to be adapted to South African conditions. According to UNAIDS guidelines<sup>6</sup> a second generation surveillance system should:

- Be appropriate to the state of evolution of the epidemic;
- Be dynamic, changing with the epidemic;
- Use resources where they will generate most useful information for response planning;
- Compare biological and behavioural data for maximum explanatory power;
- Integrate information from other sources;
- Make available the data produced to increase and improve the national response.

One of the advantages of second generation surveillance systems is that they provide insight into the apparently remote, but often highly significant contextual determinants of behaviour. It is often assumed that behaviour change is a psychological and cultural phenomenon, but it is important to understand that there is a significant economic and material foundation behind risk behaviour. For example, the alarming age differentials between teenage women and older men<sup>7</sup> has much to do with material transactions. There is also a significant relation between a range of risky sexual behaviours from early sexual debut to non-use of condoms and socio-economic status.<sup>8</sup> There are also material disincentives against commercial sex workers changing their behaviour. Given this, it is important to add to the understanding of the contingencies leading to unsafe sex practices, an understanding of the mediating socio-economic factors which may need to change before certain types of risk behaviour change.

The concept of social capital is currently receiving attention, as a way of explaining the capacity of communities to engage in health-related behaviour change.<sup>9</sup> Whereas much work in the field of HIV/AIDS education has been aimed at either shifting the ideas and practices of individuals, or peer groups, as Campbell<sup>10</sup> points out, it is important to understand the “location of peer groups within ‘communities’, ‘social institutions’ and systems of ‘culture, politics, economics, and environment’.”<sup>11</sup> The concept of social capital provides some indication of how a community is organised in order that it may participate in development and change processes, one important aspect of which is the horizontal networks of formal and informal community interaction. Satisfactory levels of social capital imply the likelihood that health promotion interventions will be effective. This relies on the community having organisational entities and systems that are supportive of the enterprise, and which may be activated towards this end.

Social capital is not an economic concept but it is directly affected by socio-economic contingencies. Whilst impoverished communities can overcome the lack of infrastructural development which facilitates civic involvement in health promoting activities through having relatively cohesive informal support

networks, 'a point of economic crisis or hardship is reached beyond which reciprocity between households ceases'.<sup>12</sup> The resources available within communities impact on the communities ability to respond to the AIDS crisis and ways of identifying vulnerability of communities in this sense, is a matter for economists and other social scientists to work closely together on.

## Community mobilisation and development

Kelly and Parker (2000)<sup>12</sup> in a qualitative study of factors mediating youth response to HIV/AIDS in six sentinel sites across South Africa, have suggested that whilst there is ample evidence that youth are experimenting with prevention behaviours, there is little mobilisation at a community level of the kind of support for behaviour change that is required to sustain such changes. There is also not much evidence of mobilisation for the care challenges that these communities will face. Rural communities in particular, show a lack of mobilisation of community based organisations, churches, schools, and youth organisations by way of supporting prevention and care efforts. There is a need to evaluate the range and type of responses that are occurring and to develop an understanding of what will be required. Further, there is need to understand which forms of community mobilisation are proving effective for addressing particular needs and how mobilisation might be fast-tracked in communities where there is little activity. The mechanisms and costs attached to the development of programmes in such areas needs to be established as a foundation for such mobilisation.

There are more than 1 000 large HIV/AIDS oriented organisations registered in the National AIDS Directory, and many more smaller community based organisations. There is however little understanding of the number of people employed or providing volunteer services in these organisations, the costs of maintaining these organisations, the funding sources being drawn on, and the impact of these organisations on the servicing of other health and welfare needs. The proliferation of these organisations and the widespread recognition of the need to prioritise HIV/AIDS programmes will shift the focus of community development programmes and this also needs to be studied. Evaluation of the social and economic aspects of community mobilisation is important as AIDS will increasingly be incorporated into community development efforts. Whether or not the impact of building AIDS into community development efforts is likely to impact positively or negatively on community development is a largely unresearched area.

Baier<sup>13</sup> describes the HIV/AIDS epidemic as a development problem of critical importance, rather than simply a health issue. How important it is cannot be appreciated without analysis of the socio-economic impact of HIV/AIDS on rural economies. It is noted in this article that rural households and communities develop and adapt their own coping mechanisms and support programmes need to be developed to support the same. Whiteside<sup>14</sup> and Topouzis,<sup>15</sup> describe some of the HIV/AIDS implications for rural development and outline areas of overlap between HIV/AIDS response needs and development needs and strategies. Suggestions include the need for: poverty alleviation (including household coping strategies, adult death and household dependency ratios); food security and sustainable livelihoods; empowerment of rural women; support for affected and infected families and orphans; human resources needs and capacity assessment of public and private rural development; and policy/programme review.

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