THE DETERMINANTS AND IMPACT OF HIV/AIDS ON THE LABOUR MARKET IN SOUTH AFRICA

FINAL SYNTHESIS REPORT FOR

THE DEPARTMENT OF TRADE AND INDUSTRY

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GLOSSARY OF TERMS

Antenatal Clinic survey (ANC)

Since 1998, the Department of Health has conducted an annual survey of pregnant women attending state antenatal clinics. The data collected forms the basis of establishing the prevalence of HIV and sexually transmitted disease among the respondents. This data is extrapolated to establish the aggregate prevalence of HIV across the national population.

Susceptibility

Susceptibility is the likelihood of a person being infected with a particular disease. For women are more susceptible to HIV infection for physiological reasons. However, the particular socio-economic context or other conditions of an individual or group may improve or reduce the chances of contracting the disease. For instance, workers in the transport sector spend extended periods away from their regular and/or long-term partners, and have been shown to have higher infection levels than other workers. It is argued that it is their mobility that increases the likelihood of engaging in unsafe and risky sexual practices , such as having sex with commercial sex workers, who are a high-risk group.

Prevalence

Prevalence refers to the rate of HIV infection or AIDS among a certain sub-group or population for a particular period, expressed as a percentage. The national aggregate HIV prevalence among people older than 2 years is 11.2 per cent in South Africa (Shisana et al 2002). Biological tests (sample of blood or saliva) are used to measure HIV prevalence. Estimates of HIV prevalence can also be established through indirect means, using extrapolations and modeling techniques. The latter methods however, are based on some form of original prevalence data, such as those collected through the Antenatal clinic surveys.

HIV Infections

This is the absolute number of people who are infected, or living with HIV in the population or sub-population group, such as an industrial sector. Thus, at the end of 2003, the number of HIV infections in the world is 37.8 million, of which women constituted 17 million (UNAIDS 2004).

Incidence

Incidence refers to the growth of the HIV epidemic from one period to another. Thus, the number of new HIV infections worldwide at the end of 2003 is 4.8 million. Incidence is a more accurate measure of the development(growth or decline of the epidemic) rather than prevalence. It

is however, much more difficult to measure as it assumes the collection of time-series data , which is very expensive and much more difficult to organize., especially in developing countries where the disease is concentrated.

Morbidity

This refers to AIDS-related illnesses. Subsequent to the initial contraction of the HIV infection (in the absence of treatment), the infected person will develop AIDS-related secondary infections (including thrush, pneumonia, tuberculosis etc.) and illnesses as the number of T-cells in the body declines, or the viral load increases.

Incubation period

This refers to the average period between the initial HIV infection and the development of AIDS-related infections and illnesses, and AIDS deaths (Whiteside and Sunter, 2000). In South Africa, in the absence of treatment, the average incubation period is conservatively set between 6-8 years, or 8-10 years based on estimates in developed countries. The incubation period may differ for men and women, and some people may live longer than these average estimates.

Mortality

AIDS mortality refers to the rate of deaths among the infected persons. AIDS mortality is normally indicated as the excess mortality above the normal patterns of non-AIDS mortality. The estimated period between displaying AIDS-related illnesses and AIDS death is approximately 1-2 years in the absence of treatment.

Vulnerability

Vulnerability refers to the overall negative impact that HIV/AIDS may have on an individual, household, company, sector, economy, given the social, economic and other societal costs.

Voluntary Counselling and Testing

A biological test (on samples of blood or saliva) is general used to establish the HIV infection. Several such tests exist, and they generally establish the presence of HIV antibodies. Testing may occur under the different circumstances, such as VCT and/or surveillance testing. VCT occur when pre and post-test counseling is provided to the individual, followed by the release of the results. This is one of the ways of facilitating knowledge of one's HIV status. Surveillance testing involve large-scale HIV testing of populations or sub-groups, such as population surveys, or the testing of pregnant women attending state antenatal clinics.

INTRODUCTION

South Africa has a generalized HIV/AIDS epidemic affecting all sectors of society; it is growing and takes place within a region, sub-Saharan Africa that has become the global epi-centre of the HIV/AIDS epidemic. Thus, 25 million, or two thirds of all people living with HIV, are in the region. Coupled with the fact that sub-Saharan Africa also has the highest concentration of poor people, and underdevelopment, the situation seems dire. South Africa is one of the most severely affected in terms of HIV/AIDS, although we are economically much better off than the rest of the region.

However, increased exposure to the forces of globalisation by the South African economy has made it particularly sensitive to the scope and nature of the HIV/AIDS impact. This includes trade and investment prospects, as much of this is often dominated by perceptions. Further, macro-economic results on the HIV/AIDS have been quite mixed, ranging from modest projected declines in aggregate growth to predictions of potential "economic collapse" in the absence of active intervention. Similarly, projections of the demographic impact of HIV/AIDS also vary in terms of the scope and direction of the epidemic. While it is not necessary possible to attain complete certainty, a reduction in these insecurities regarding the HIV/AIDS impact is essential in reducing "doomsday" perceptions. It is true though, that efforts directed at addressing structural problems including high levels of unemployment, the skills deficit and high levels of income inequality might now be even more complicated, by the negative impact of HIV/AIDS.

The aim of this literature review for the Department of Trade & Industry is two-fold:

- To enhance the understanding of senior dti policymakers of the main determinants and economic impact of HIV/AIDS on the South Africa ; and
- To assist in defining policy directions on the management of HIV/AIDS impact on industrial policy, as well as the labour market.

In trying to achieved the aforementioned aim, this synthesis report provides an overview of the following areas:

- An understanding of structural channels of impact on the macro-economy;
- An understanding of nature and scope of available data;
- An overview of the HIV/AIDS impact on the national and working age population;
- An overview of HIV/AIDS risk dynamics;
- Impact on the Labour Market and sectors;

- Impact on supply and quality of skills;
- HIV/AIDS estimates across economic sectors;
- Impact on responses in the private sector and the automotive sector; and
- Policy implications for the **dtl**.

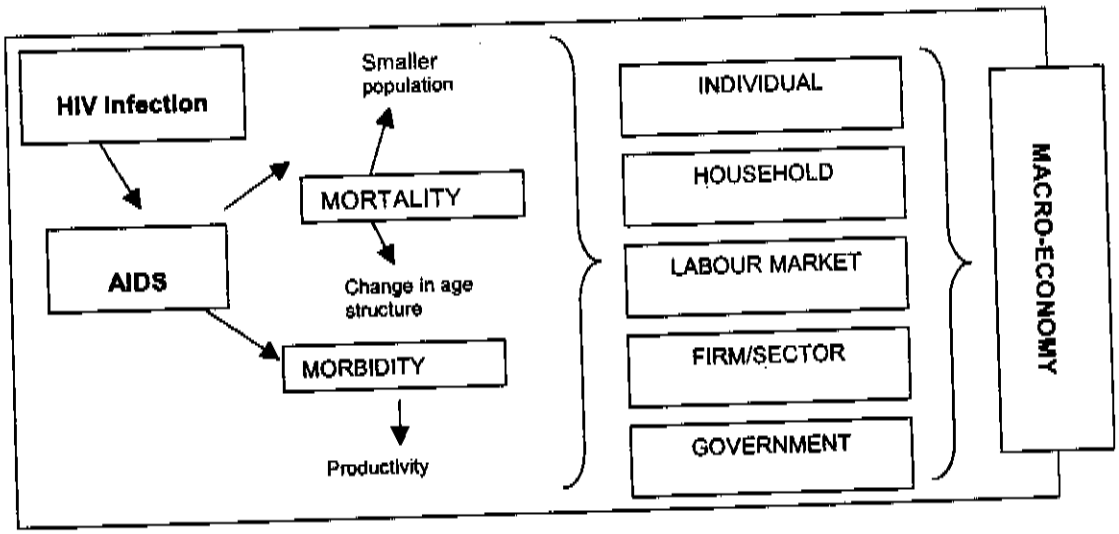
Finally, this synthesis report derives its findings from a series of papers written in 2002-2003 by the HSRC on a project entitled, "Developing methodologies to assess the impact of HIV/AIDS on labour supply and the implications for critical economic sectors". This project was conducted under the auspices of the Joint Center for Political and Economic Studies (funded by USAID, DFID and AusAID).

The purpose of the project was to develop a methodology that will enable the analysis of HIV/AIDS on prevalence, morbidity and mortality on key economic sectors. Further, the project focused on consolidating the literature on labour market dynamics and HIV/AIDS impact, as well as modeling approaches, in terms of demographic and economic modeling used thus far. Four (4) papers were developed, including a series of consultative and feedback workshops with key researchers and academics in HIV/AIDS, government departments and so forth. A set of sectoral estimates on HIV/AIDS on economic sectors was developed. It is anticipated that these modeled estimates will be tested in a sector survey, in order to validate the findings. This report also includes some additional materials pertaining to new research developments subsequent to 2003.

BACKGROUND

The HIV/AIDS epidemic is characterized as a "long-wave" event, in that the developmental consequences of the initial HIV infection only become evident over a period given increased AIDS morbidity and mortality. Figure 1 illustrates how the dynamic effects of AIDS morbidity and mortality feed through at a micro-economic level. Thus, increased AIDS morbidity as a result of AIDS-related secondary infections and illnesses result in changes in productivity levels at an aggregate level. Further, increased AIDS mortality may result in a relative smaller population than anticipated, as well as changes in the demographic composition of the population. This will in turn impact at individual, household, labour market, firm and sector levels, resulting in an impact at the macro-economic level. As to be expected, current research and knowledge give varying pictures as to the nature and size of these impacts, at all levels. However, all agree that the epidemic is serious in terms of its long-term developmental consequences, especially given the historical underdevelopment of the majority of the population.

Figure 1: HIV/AIDS structural channels of impact on the macro- economy



Source: Badcock-Walters,2002.

As is evident from this illustration, trying to comprehend the macro-economic effects is a complex process. It is further informed by the scope and nature of knowledge of impacts at the micro-economic level, which has been extremely uneven. Over the last few years, there has been a definite improvement in the scope and nature of available, which is reviewed in the section that follows.

Scope and Nature of Data

The collection of sufficient, relevant and reliable labour market data is a perennial problem in the South African policy-making sphere, and HIV/AIDS is no exception. Thus, HIV/AIDS research suffers from a number of constraints and limitations regarding the quantity and quality of source data (Parker *et al* 2000; Abt Associates 2000). The following section briefly describes the main sources of data, and provides a limited assessment of the underlying data.

Antenatal Clinic Data

Until 2002, the anonymous, voluntary and unlinked Antenatal clinic (ANC) surveys were the main source of data on all HIV/AIDS related indicators. Despite its limitations, in developing countries it remains the most reliable source of HIV surveillance data, at national and provincial levels (Dorrington and Johnson 2002). Moreover, it constitutes the source data of most long-term projections at macro-economic level, demographic population projections as well as company and sector projections of HIV risk and vulnerability.

Since 1998, the Department of Health has conducted an annual survey that collects sero-prevalence data on HIV and sexual transmitted infections (STIs) amongst pregnant women attending state health clinics (Department of Health 2001). This data is adjusted or calibrated to be

more representative of other sub-population categories for projection purposes (Department of Health 2001) Thus, the demographic models extrapolate national population projections from the ANC data *via* demographic and occupational information from the Census 1996, the October Household Surveys (OHS) 1995 and 1997, and the South African Demographic and Health Survey (SADHS), as well as fertility and mortality estimates (Abt Associates 2000; BER 2001). Some of the limitations related to the ANC data have been identified, including

- The sampling population is not representative of the population and the labour force, in that it consists mostly of African women, 15-49 years, and is not fully representative of the demographic profile;

It excludes other sub-populations with different risk dynamics, such as:

- men;
- pregnant women who use the private health sector;
- children who are not yet sexually active;
- the elderly who may have less sexually active lives(Abt Associates 2000); and
- non-pregnant women.

The ANC data does not sufficiently reflect other socio-economic categories including income, skills and occupation, as African women are predominantly low-skilled , poorly educated and low-paid relative to other groups. It has an inherently biased effect, as pregnant women are more likely to have a higher HIV prevalence rate as they have engaged in unprotected sex:

Thus, given the select nature of the ANC data, it may not sufficiently reflect national population prevalence, and may result in potential overestimations of national HIV prevalence (Abt Associates 2000), and/or underestimate HIV prevalence in other population groups (Dorrington and Johnson 2002).

At a micro-level, there is increasingly more data being collected at household, firm or sector level. However, there is still a long way to go, in order to fill the gaps to conduct more reliable projections and correct some of the deficiencies related to ANC data.

Household survey data

The first nationally representative anonymous, voluntary and linked sero-prevalence survey was conducted in 2002, by the Nelson Mandela Foundation [NMF] and the HSRC (2002). It surveyed approximately 11 000 individuals, and prevalence data for just over 8000 persons, of 2 years and older. This is a major step forward in terms of providing prevalence information on a much more demographically representative population, and also provides more information on

those factors that increase HIV susceptibility, as well as trends in behaviour change. The research findings have challenged some of the existing assumptions regarding the size and scope of the HIV/AIDS epidemic, but have also confirmed some trends predicted in for instance, the ASSA2000 projections. The data does provide an understanding of the socio-economic determinants of risky sexual practices, such as demographic profile, educational status and location. However, many other labour market categories, such as income and employment status have not been sufficiently explored. Given that the data is not publicly available, it lessens the opportunity to begin to explore these areas. However, the aggregate results of the survey have been used in setting new parameters in demographic modeling, including the ASSA2002, as well as sectoral modeling by the HSRC in this report. A second round of the survey was conducted in 2004, the results of which are not available yet. Smaller household surveys based in communities, have been conducted, focusing on poverty and income dynamics, risk behaviour among others.

Company / sector level data

Information on the labour market impact at a company or sector level is improving, but it is still not comprehensive; it is unevenly spread, sometimes of an anecdotal nature and not always in the public domain. Much of the information that is publicly available on the HIV prevalence rates are based on large formal sector companies, so that much less is known about the level of risk faced by smaller and medium-sized companies. There is now a move towards consolidating different company sero-prevalence databases to provide estimates of the potential level of HIV risk at sector level.

There are three (3) main methods to assess the level of HIV/AIDS risk in a company (Rau, 2002):

- Conduct a HIV prevalence survey among all workers. Extrapolate the test results in terms of the effect on direct and indirect costs, such as medical, retirement and death benefits, absenteeism, training and so forth; a variant on this is continuous VCT(voluntary counselling and testing) which may establish , depending on the take-up rate an aggregate HIV prevalence rate across the company;
- Extrapolate national prevalence rates in terms of the specific demographic profile of the company, and estimate workforce prevalence and AIDS-related costs: a variant on this is to assume that the company prevalence is the same as the national prevalence;
- Track and monitor management information records that may capture historical data on trends in AIDS–related indicators, such as sickness-related absenteeism, medical, retirement, AIDS-related deaths, productivity and other factors that may impact on the business.

As indicated previously, where private and public organizations do conduct such studies, the information is regarded as sensitive and confidential (especially in terms of consumer base, competitors and shareholder confidence) and are not always made publicly available. . However, there is increasingly more information (even sero-prevalence data) are being released, sometimes under strict confidentiality agreements.

This is likely to change given proposed reporting proposals by a range of key stakeholders. Thus, in the private sector, according to recommendations from the second King Report on Corporate Governance, the Promotion of Access to Information Act 2000, as well as the SA Institute of Chartered Accountants and the Johannesburg Securities Exchange (JSE), companies will in future be required to disclose their HIV/AIDS risk exposure and management strategies in their annual financial reports (Temkin 2002). There are also efforts by the Global Reporting Initiative (GRI) to encourage especially large multinationals to report on a range of issues, including HIV/AIDS.

At sector level there is hardly any information in the public domain, except for high-risk sectors such as mining and to some extent, transport. The cross-country studies (Evian, Slotow, Rosen, Thea, Fox, Macleod and Simon 2002) in Southern Africa represent one of the few studies on mining, heavy manufacturing and transport sectors. An extension of these results is apparently to be released in the near future. The limitation of these studies is that they are not necessarily based on representative sector samples and is therefore not able to make conclusive statements about the specific sectors involved.

In the public sector, past and ongoing risk assessment studies have been conducted on the impact on the broad government sector, education (schooling and higher education) and the health sector (Fowler 2001; Henscher 2000). These have not included large-scale HIV prevalence surveys, although isolated testing has taken place, for example, on certain military units in the South African National Defence Force (Heywood 2000). However, the recent studies in 2002 and 2004 on the health and education sectors have vastly improved the range of information available on large sections of the civil service, and skilled and highly skilled employees.

The use of models and projections

Survey data is a necessary, but not sufficient tool to establish the nature, scope and progression of HIV/AIDS. Thus, surveys can be expensive and time-consuming to conduct, and according to Rehle and Shisana (2003) do not lend itself to the measurement of key HIV/AIDS parameters such as AIDS cases, AIDS deaths, mortality rates, population growth and life expectancy. Further, the epidemiological progression of the disease from an initial HIV infection, AIDS sickness and AIDS death, over a relatively short period, are impossible to capture in a survey. Thus, models are more able to capture the long-term progression the disease. It also allows for the development of scenarios, with which to test the possible outcomes of interventions,

changes in dynamics and so forth. However, the development of primary data and models are not exclusive to one another. Thus, good quality and reliable data allows for the establishment of more realistic parameters and assumptions, as well as more reliable medium- to long-term predictions. Thus, in order to plan effectively for the medium-to long-term developmental consequences of HIV/AIDS, both survey data and modelling are required.

UNDERSTANDING HIV RISK DYNAMICS

HIV infections do not occur within a vacuum; thus an understanding of the complexities of risk dynamics is essential in reducing possible exposure and vulnerabilities at individual, household, company, sector and government levels. Public health literature has firmly established a relationship between poverty, socio-economic disadvantage and disease susceptibility (Stillwagon 2002). Thus, HIV infections South Africa are mostly transmitted through unprotected heterosexual sexual practices, and to a lesser extent Mother to child transmission [MTCT] (at birth or through breastfeeding). However, while behavioural practices underpin this transmission, such behaviour is also shaped by other structural, cultural and bio-medical/physiological factors.

One of the difficulties has been to isolate these determinants, other than behaviours that drive susceptibility and vulnerability to HIV/AIDS. Thus, most demographic models, including ASSA2000 and the Abt/Metropolitan models assume heterosexual transmission and that the epidemic moves across and within the following four behavioural risk groups:

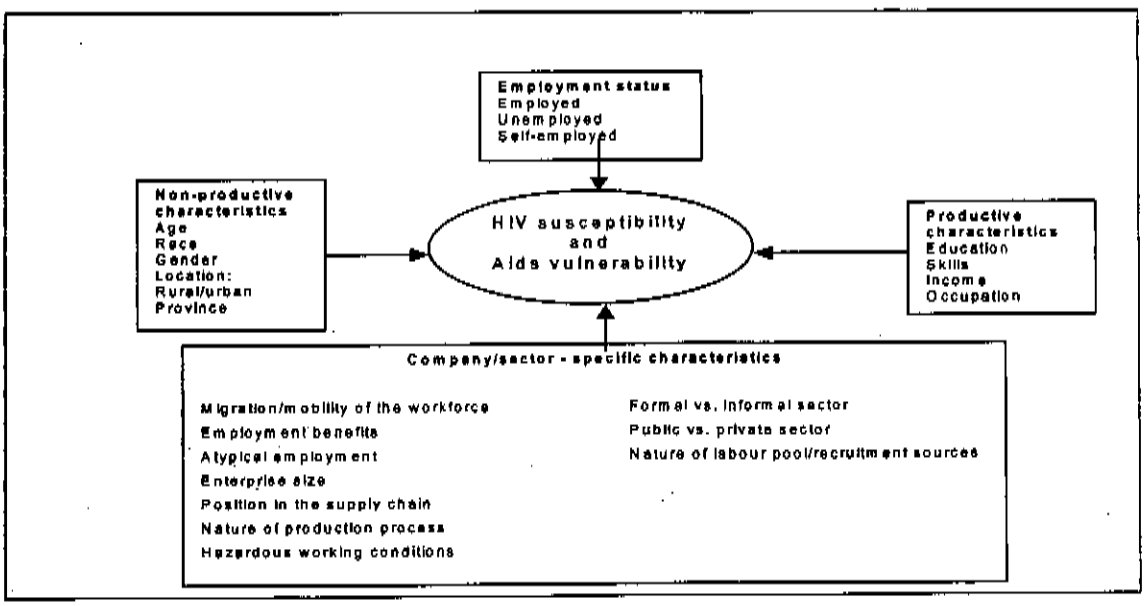
- commercial sex workers and their clients;
- those who have a high incidence of sexually-transmitted infections, a major contributory factor in HIV transmission;
- those with a normal risk of HIV infection; and
- those with no risk of being infected (eg. children and the elderly) (Bureau for Economic Research 2001: 4).

Given the lack of empirical data, most models make artificial assumptions about sub-populations and their relative levels of risk. Thus, demographic profiles remained the main source of such assumptions, much of which is drawn from a skewed sample as contained in the ANC survey. With the advent of more household level information, it has become more possible to develop a more nuanced interpretation of risk dynamics, especially in how socio-economic and demographic factors interact.

The literature suggests that there is a more complex relationship among those determinants, factors and conditions that are driving HIV susceptibility and AIDS vulnerability, than is alluded to by aggregate statistics.

Figure 2 is an attempt to highlight those factors in the South African context, and in the labour market specifically that may influence HIV susceptibility and vulnerability. Thus, socio-economic disadvantage in the South African context is largely mediated by a person's position relative to the labour market, and employment status.

Figure 2: Risk factors in the labour market that may influence HIV susceptibility and vulnerability



Source: Vass, 2002.

Figure 2 is premised on the assumption that a person's employment status (employed [formal or informal], unemployed, and self-employed) forms the basis of all labour market participation, and the aggregate HIV risk and vulnerability that person will be exposed to. Further, while non-productive characteristics (age, gender, race etc) may be a first indicator of HIV susceptibility, given historical inequities, but other productive characteristics specific to the labour market may reduce or increase HIV susceptibility and AIDS vulnerability. Finally, all of these factors interact within a particular company or sector environment.

Much of the available research has confirmed to some extent the relationship between demographic characteristics (age, sex, education, sex, location) and HIV risk behaviours. However, with regard to non-demographic characteristics, the only available research relates to migration and increased probabilities of HIV infections. There are some initial indications that casualised employees tend to have higher infection levels, as opposed to permanent ones (Evian et al 2001).

IMPACT ON THE POPULATION

Prior to 2002, much of the demographic projections on the impact of HIV/AIDS on the national population were based on ANC data. The household prevalence survey provides an additional source of data, to explore the dynamics of the epidemic, as well as inform assumptions underpinning demographic and other projections. Demographic projections on the HIV/AIDS impact on the size and structure of the national population are currently the main basis upon which HIV prevalence and risk is extrapolated at a company, sector, labour market, and macro-economic levels. This section provides a summary of projections on key demographic indicators in the national population as conducted by local and international agencies. The projections by international agencies in this table are based on the antenatal clinic data (as well as the ASSA results). In mid-2004, ASSA2002 was released, an updated version of ASSA 2000, which included the results from the Mandela/HSRC household survey. However, the figures in this report only include results for ASSA2000.

Impact on Size of the Population

Table 1 provides a summary of the main HIV/Aids projections on key demographic variables. The agencies involved are UNAIDS/WHO (2002), United Nations Population Division (2002), US Census Bureau (2002), World Bank (2002) and the Centre for Actuarial Research / Medical Research Council / Actuarial Society of South Africa (Dorrington et al., 2002, referred as CARE/MRC/ASSA) and Rehle & Shisana (2003) based on the 2002 HSRC/Mandela household survey. It is evident that there are differences in terms of the overall magnitude and direction of the epidemic.

Table 1: Projections on the HIV/AIDS impact on South African population

Variable	Source	Period					
		1995	2000	2001	2003	2005	2010
Adult HIV prevalence (15-49 yrs)%	HSRC/Mandela	6.8	17.0	17.3	17.0	16.3	15.2
	US Census	7.8	21.0	23.4	28.6	32.5	37.0
	UNAIDS/WHO		20.1				
		2000	2001	2002	2003	2005	2010
Total number of HIV infected (millions)	HSRC/Mandela	4.46	4.62	4.69	4.68	4.58	4.38
	CARE/MRC/ASSA	5.26	5.97	6.56	7.03	7.59	7.25
	UNAIDS/WHO		5.0				
Peak prevalence year	HSRC/Mandela	2002(HIV in total population)					
	CARE/MRC/ASSA	2006(HIV in total population)					
	UNPOP	2013(HIV in 15+ denominator population					
		2000	2001	2002	2003	2005	2010

AIDS deaths (thousands)	HSRC/Mandela	220	274	327	376	451	470
	US Census	264	325	394	474	665	919
	UNAIDS/WHO	360					
		1996	**2001**	**2005**	**2010**	**2015**	**2020**
Size of the population (millions)	HSRC/Mandela	40.59	43.63	45.07	46.09	46.92	47.46
	CARE/MRC/ASSA	41.45	45.77	47.49	47.39		
	US Census	40.72	42.57	42.55	40.61	38.04	35.85
	World Bank			43.98	44.78	45.82	47.02
	UNPOP	43.79				43.98	

Source: Extracted from Rehle and Shisana, 2003.

Much of these differences may be attributed to differences in source data, in that the HSRC projections are based on the household prevalence surveys, whereas the others are based on extrapolations from the ANC surveys. What it does show is that the HSRC projections suggest a smaller impact on the population in terms of all the main indicators, including HIV prevalence, number of AIDS deaths, and declines in the population relative to an AIDS scenario. The revised ASSA2002 projection now indicates a smaller number of HIV infections (5million), 25% less than the 7 million predicted previously (ASSA 2004). Thus, this narrows the gap with the NMF/HSRC project to a very large extent.

The US Census projection predicts the largest declines in the total population at 35.85 million in 2020, compared to 47.02 and 47.46 million for the World Bank and HSRC respectively. The following provides a range of reasons for these apparent differences:

- Different source data inform the HIV prevalence rates (Rehle and Shisana 2003);
- Different parameters are used such as the progression from infection to deaths, fertility rates and so forth;
- The HSRC assumes that the epidemic has reached its peak in 2002, whereas ASSA for instance, assumes that it will only be reached in 2006. Thus, while one assumes that the epidemic is now mature, the other assumes that HIV infections are still growing;
- Mortality data released recently had an impact on the ASSA2002 projections;.

Other factors may have impacted on the future trajectory of the epidemic, including:

- Treatment and care programmes by the state and the private sector which may extend the survival rate between HIV infection and death;
- MTCT programmes that may have a declining effect on infection rates among infants; and
- The possible positive effect of prevention and awareness programmes in regard to behaviour change, among target populations.

The differences in projections are a complicating factor for planning purposes, and sometimes may obfuscate the seriousness of the epidemic. It is inevitable though that these projected demographic scenarios are subject to change given different parameters, as more data are generated from surveys. Thus, more certainty regarding the size and scope of the epidemic is possible, but over time.

With regard to the impact on the structure of the population, given the age distribution of HIV infection and mortality, life expectancy will be reduced. As above, while all the projections differ in regard to the exact size and the timing of the decline, they all predict that it will be severe as shown in Table 2. It is understood that the new ASSA2002, now predicts that life expectancy at birth is to decline to 50 years, as opposed to 43 years previously(ASSA 2004).

Table 2: Projected life expectancy (1999-2010)

Indicator	1999	2005	2010
Life expectancy: female (Abt/Metropolitan)	54 years	43 years	37 years
Life expectancy: male (Metropolitan)	50 years	43 years	38 years
Life expectancy: general population (ASSA2000)	55 years[a]	46 years	41 years
Life expectancy: Rehle and Shisana(2003)	50.4 years[b]	45.2 years	47.2 years

Source: Moore, D. 1999; ASSA2000; Rehle and Shisana 2003.

The growth in orphanhood as shown in Table 3, largely driven by Aids deaths among parents have serious implications in terms of social welfare of children, schooling, and their entry into the labour market.

Table 3: Comparison of Aids orphans projected for South Africa(millions)

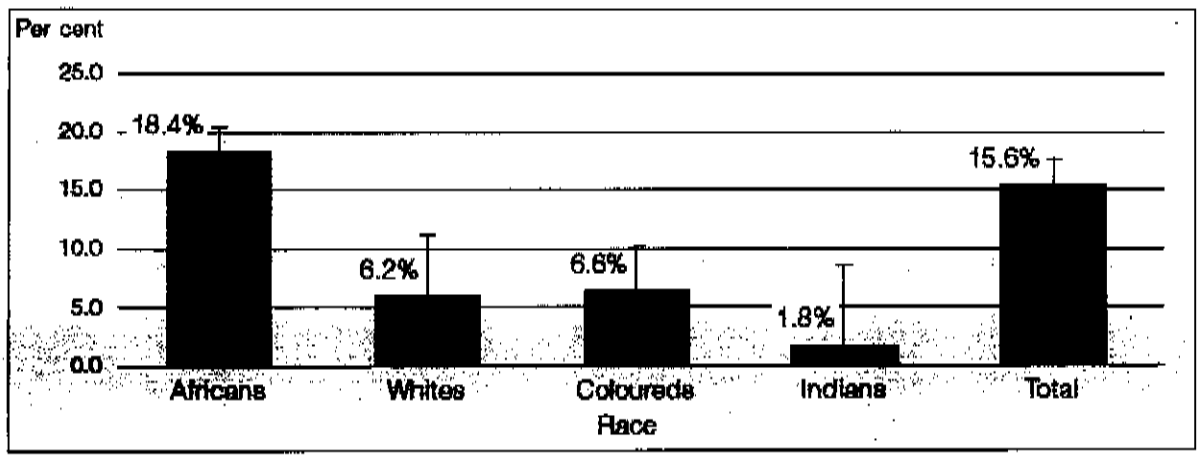
	2003	2005	2010	2015
HSRC	1.05	1.52	2.39	2.57
ASSA	391,137	685,354	1,531,229	1,854,462

Impact of Age, Population group and Sex

Further to changes in the composition and structure of the population the effects of age, population group and sex are important, as shown in Figure 3 and Figure 4.HIV infection peaks among adults, 15-49 years, who are in their most economically productive years. Further, all studies on the distribution of HIV prevalence by population group, consistently shows that the highest HIV prevalence rates are concentrated among Africans, relative to other population groups (ASSA2000, NMF/HSRC 2002). However, the most recent studies also confirm that the epidemic

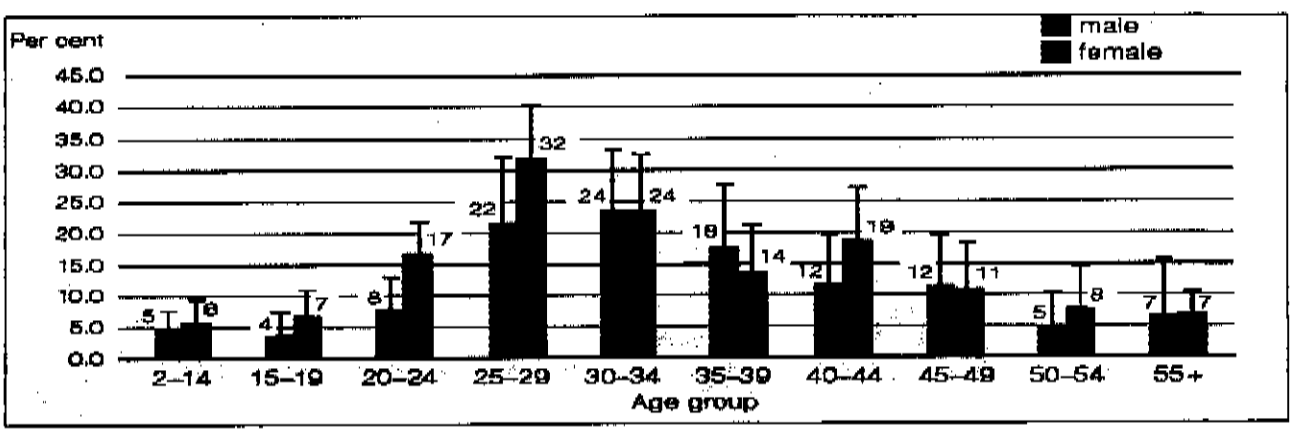
is fairly serious among Whites, in that higher prevalence rates are recorded when compared to similar populations in other Western countries(NMF/HSRC 2002).

Figure 3: HIV prevalence among adults aged 15–49 years by race, South Africa 2002



Source: NMF/HSRC 2002.

Figure 4: Prevalence of HIV by sex and age, South Africa 2002



The NMF/HSRC study, as shown in Figure 4, confirms the age and sex effect, as shown in other studies, including the ASSA2000 projections. Thus, HIV infections are higher among women, and concentrated among younger adults, while women are infected at a younger age than men.

Mortality results, based on an analysis of cause of death on death certificates, released recently confirm that AIDS –related death peak at younger age cohorts (StatsSA 2004).

The effect of these trends are particularly important for the size, structure and functioning of the labour market, as the negative consequences of the epidemic affect the economically active population severely.

IMPACT ON THE LABOUR MARKET

Given the age, sex and population group and skills effect of HIV/AIDS, the impact is likely to disproportionately affect the historically disadvantaged in the labour market, especially Africans and women, the lowly skilled and lowly paid. Also, the labour participation rate of both men and women peaks in their mid-thirties. However, given HIV/AIDS, labour participation rate is likely to decline, with a more pronounced effect for women and the low-skilled.

The indications are that HIV/AIDS will exacerbate and consolidate current deficits and inequalities within the labour market, in the absence of concerted interventions to mitigate its impact. This section looks at the estimated impact of HIV/AIDS on the size, structure and quality of labour supply, based on projections by ING Barings, Abt Metropolitan and Arndt and Lewis.

Impact on Size of Labour Supply

Table 4 illustrates the progression of HIV/AIDS in the labour force and demonstrates how an initial wave of HIV infection is followed by increased AIDS morbidity as the infected labour force contracts secondary AIDS-related infections and illnesses. Thus, between 0-7 years after the initial asymptomatic HIV infection, the labour force is likely to experience temporary labour turnover as increased absenteeism and a general decline in productivity take place. More permanent labour losses follow, as the infected employees develop full-blown AIDS, approximately 1-2 years before death or ill-health retirement, in the absence of treatment (Rosen et al, 2001).

Table 4: Progression of HIV/AIDS in the labour force

Timeframe	Projected effect on the labour force
Year 0	Employee becomes infected with HIV.
Year 0-7	Morbidity begins (secondary infections, increased absenteeism, sick and compassionate leave)
Years 7 –10	Employee leaves workforce by resigning, retirement or death due to AIDS.
Years 7-10	Company hires replacement employee.

Source: Rosen et al 2001.

Macro-modelling results indicate that AIDS-related death will result in a smaller labour force compared to a no-AIDS scenario. Thus, as shown in Table 5, given the impact of HIV/AIDS, labour force growth will decline, resulting in a smaller labour force when compared to a no-AIDS scenario (BER, 2001). Quattek (2000) predicts an 18 per cent decline in the labour force by 2015, while Abt/Metropolitan predicts a decline of 21 per cent by 2015 (BER 2001).

Table 5: Projected changes in the size of the labour force (millions) (2000-2015)

Year	No AIDS scenario (millions)	AIDS scenario (millions)	Percentage difference
2000	14.5	14.4	-0.7
2005	15.8	15.1	-4
2010	17.2	15.1	-12
2015	18.7	14.8	-21

Source: Abt Associates-Metropolitan Life as cited in Bureau for Economic Research 2001:12.

The projected reduction in the labour force flows from the twin impacts of increased adult mortality (especially those aged 15-49 years) and reduced life expectancy. As a result, the projected reduction in the population growth rate reaches zero percent in 2009, and negative growth of –0.5% by 2015 (BER 2001). The NMF/HSRC study, while not predicting negative population growth, does indicate a slow-down in the rate of population growth.

The provision of care and ARV treatment at both state and private sector levels are key in reducing AIDS morbidity and AIDS deaths, and in this way increase life expectancy of the labour force. Further, there is increased risk attached to education and training, as the returns to investment may be threatened by a reduced life expectancy. This has particularly grave implications for employment equity efforts aimed at Africans and women, given the disproportionate impact on their productive lives.

Impact on Structure of Labour Supply

The effects of the age and sex distribution of HIV/AIDS will affect the structure of the labour force negatively. Given the disproportionate impact on those 15-49 years, the composition of the labour force is likely to undergo structural change, as it become both younger and older. Lisk (2002:4) refers to this potential age imbalance as the so-called 'chimney' or 'hollowing-out' effect. Other supporting studies of this trend, include findings of a Medical Research Council study that the general increase in adult mortality (15-49 years) between 1985 and 1999/2000, and a doubling of the mortality rate in the 30-35 year age range, may be attributed to HIV/AIDS (Dorrington, Bourne, Bradshaw & Laubscher 2001:5-6). More recent mortality results by both the MRC and StatsSA confirm these general trends in terms of the younger age distribution of deaths, related to AIDS.

There are three major consequences of the age effect, and the decline in the number of young, productive adults:

- Firstly, the extended stay of retirees in the labour force given their support of AIDS orphans and lack of support from adult children.

- Secondly, increased possibilities of child labour, due to AIDS orphan-hood and financial pressures.
- Finally, a decline in the quality of skills and experience in the labour force, given AIDS related losses of productive adults.

Effect of Population group and Sex

The main drivers of HIV/AIDS prevalence in the South African population are sex and population group. Thus, both Figure 3 and Figure 4 show that the highest prevalence rates are concentrated among Africans and women. Most local studies attribute this trend to historically socio-economic disadvantages and high levels of poverty among these sub-groups, which in turn create increased susceptibility to disease.

Many describe the disproportionately negative impact of HIV/AIDS on women, as a 'crisis for the advancement of women. The following consequences may occur:

- the labour participation rate of women workers will decline at a faster rate as they are infected at a younger age, and the effects of AIDS-related morbidity and mortality in their mid-thirties;
- the unemployment rate among women may increase,or shift women out of the labour force to the not economically active population;
- due to their reduced stay in the labour force, women may not accumulate sufficient skills and experience, thus increasing the gender -based skill imbalance;
- women workers will spend more time caring for sick relatives and other AIDS orphans, further impacting on lowered labour participation rates;
- more women will be forced into marginalised informal sector work, due to the flexibility in terms of hours available for home-based AIDS care activities.
- African women constitute a significant proportion of discouraged unemployed, and the HIV/AIDS impact may now exacerbate existing low levels of employment. This disparity may translate into a gender imbalance in favour of men in both the population and labour force structures.

However, these aggregate HIV susceptibility patterns also tend to assume that all Africans and all women are the same and display uniform risk behaviours in terms of HIV susceptibility. However, the changes in socio-economic status of sections of both Africans and women must be considered. Thus, affirmative action, employment equity and skills development have increased the number of Blacks and women at management level, and in skilled positions formerly dominated

by Whites. Also, organised workers have had some income gains through the collective bargaining infrastructure, as well as minimum wage determinations.

Thus, while Africans and women are generally the most disadvantaged groups in South African labour market, there is a complex interplay of demographic characteristics, including race, gender, province, age, education and other socio-economic characteristics such as income, skills and occupation that produce a more differentiated picture. However, with the current data available it is not always possible to explore this interaction more fully.

Impact on Quality of Labour Supply

In this section, the focus will be on how the distribution of HIV/AIDS by education, skills and occupational categories potentially impact on the quality of labour supply, especially in light of the previous discussion on changes in the structure of labour supply

As indicated before, the AIDS morbidity and mortality impacts of age, race and gender will fundamentally affect the structure of the labour force, but also the range of skills, knowledge and experience. Most macro-modeling results indicate that the consequent declines in the range of skills, knowledge and experience in the labour force, will culminate in productivity declines. The effect on human resources capacity amounts to a generational deficit in the skills and experience of the labour force.

Potential shifts in the quality of labour supply are evident in the skills distribution of HIV/AIDS prevalence projections and the possible magnitude of skills losses. This is especially important within the context of race and gender based nature of the existing skills shortage and labour market segmentation.

Impact on skills levels

South Africa has a highly stratified and differentiated labour market (by population group, gender, education, occupation), an endemic shortage of skilled and especially highly skilled labour, and a large pool of unskilled, poorly educated and unemployed people.[2] This manifests itself in occupational segmentation patterns that are based on population group and gender, given historical uneven educational attainment and labour market discrimination. Moreover, occupational segmentation is a proxy for skills distribution, and thus will also determine the skills distribution of HIV/AIDS.

The projections illustrated in Table 6 show that **all** skill categories have unacceptably high HIV infection levels, even at high skill level (Quattek 2000, Bureau for Economic Research 2001).

[2] The research cited in this section defines the "highly skilled" as professional, semi-professional and technical, managerial, executive and administrative occupations; the "skilled" as sales, service, clerical, farmer, farm manager, artisanal, apprentice and related occupations; all other occupations are "semi-or unskilled" (Bureau for Economic Research 2001).

Growth in HIV prevalence mostly occurs between 2000 and 2005(not shown here), followed by smaller increases.

Table 6: Projected HIV prevalence rates by skill levels(2005-2015)

	Highly skilled			Skilled			Semi-and unskilled		
	2005	2010	2015	2005	2010	2015	2005	2010	2015
Quattek 2000	13%	11.2	9.3	22.6	21.7	20.2	31.6	32.7	32.6
BER 2001	13.3%	16.7%	18.3%	20.2%	23.8%	25.4%	22.8%	26.3%	27.6%

Source: Quattek 2000, ABT Associates as reported in BER 2001.

The 2 studies quoted in Table 6 have greater similarity in the period 2005 for the highly skilled and skilled, but start showing larger differences over time, especially in regard to semi-and unskilled workers. This may relate to the relative lack of reliability of projections further into the future. It is therefore important to draw comparisons with workplace studies, as projections may be either under-or overestimations of the real impact.

Selected company studies show that HIV infection levels for highly skilled professionals may be substantially lower than those suggested by projections. Evian et al. (2001) report that in selected South African companies surveyed, managerial level staff had the lowest infection rate (4 per cent) skilled staff (6.5 per cent) compared to higher infection rates of 15-21 per cent among lower skilled staff. An HIV surveillance study in 2001, at Daimler Chrysler found a 3.8 per cent infection rate among senior management, and 7.2 per cent among line management (Colvin, Connolly and Gouws 2002). A study of predominantly male, sugar mill workers in KwaZulu Natal confirmed the highest HIV prevalence rates, 27.9 per cent to 31.6 per cent, amongst the lowest payroll bands, including semi-and unskilled workers (Morris et al. 2000).

At the same time, the projections suggest a skills gradient of infection, as Table 6 also shows that there is an inverse relationship between skill level and HIV/AIDS prevalence levels. Thus, higher HIV/AIDS prevalence levels are projected for lower -skilled workers compared to higher skilled (Quattek 2000, Bureau for Economic Research 2001). Workplace studies tend to confirm the skills distribution of HIV infection, although again there may be differences in terms of the actual magnitude when compared with projections.

The increased public availability of disaggregated prevalence data will begin to address some of the inherent limitations of skills projections. Thus, the latter tend to adopt the underlying assumption that there is a constant HIV risk profile across skills categories (Abt Associates et al. 2000), that is, all workers in all skill categories have the same level of exposure to HIV infection. This is largely because skill categories are derived from occupational categories, the composition of which is largely determined by population group and gender. Thus, the skills gradient, in HIV prevalence, is a function of the age, racial and gender profile of skills categories (Bureau for

Economic Research 2001, Abt Associates *et a.l* 2000) and its interplay with existing occupational segmentation trends. The concentration of Africans and women, both high-risk groups, in semi-skilled and unskilled occupations may account for high HIV prevalence levels. In contrast, Whites have lower prevalence levels and are in predominantly highly skilled occupations.

However, skills categories are not homogenous units and have experienced demographic changes as a result of employment equity, emigration, immigration and technological changes. Thus, there is enough to suggest that current skills projections may constitute a potential overestimation, and a more nuanced analysis of the interaction of changes in skills- and demographic profiles and HIV prevalence is essential, to the extent that data becomes available.

However, it remains valid that the implications of the skills gradient of HIV infection are:

- The consolidation of existing race-and gender based patterns of occupational segmentation;
- That HIV/AIDS may adversely affect efforts to address the skills deficit, and investment in education and training, among the historically disadvantaged.

Table 7 reinforces the challenge, as it shows that for all those older than 15 years, HIV prevalence increases up till Matric, after which it declines. However, the educational patterns of HIV prevalence seem to differ by population group. Thus, African/Blacks show particularly high prevalence rates at Matric and tertiary levels, compared to other groups. This has serious implications for education and training investment, as it suggests high rates of turnover as a result of morbidity and mortality among educated Africans. At the same time, this is the first finding of its kind, and needs to be backed up with similar data[3].

Table 7: HIV Prevalence rate of persons 15 years and older by educational level and race, South Africa 2002(%)

Education	15 years	Black	White	Coloured	Indian
No school	8.3%	8.7%	0%	5.2%	0%
Primary school	12.1%	12.6%	10.7%	8.3%	1.2%
High school	14.9%	17.2%	7.7%	5.1%	0.8%
Matric	15.3%	21.1%	4.4%	6.4%	3.0%
Tertiary education	6.5%	10.2%	3.6%	2.7%	0.3%

Source: NMF/HSRC, 2002:54

[3] Some of the findings among Whites(10% prevalence among those with primary school) , and Indians are unusual, and without further study cannot be regarded as conclusive.

The rate of labour turnover as a result of AIDS morbidity and mortality poses a challenge to existing attempts to increase the pool of skilled and highly skilled labour force. It is projected that in the period 2010-2015, the projected annual AIDS death rate in the formal sector is:

- 0.8 per cent for the highly skilled;
- 2 per cent for the skilled;
- 2.2 –2.6 per cent for the semi-and unskilled (Abt Associates et al. 2000).

This means that by 2010, compared to a no-AIDS scenario, the projected labour force will be smaller; by eight per cent for the highly skilled, ten per cent for the skilled and 11-13 per cent for the semi-skilled and unskilled, in the absence of substitution or skill replacement.

In a labour market struggling with a skills deficit, with race and gender imbalance, this represents a major challenge of multiple dimensions:

- firstly, the capacity to appreciate the scope and nature of such skills losses;
- secondly, the capacity to plan how to establish replacement capacity within the next 5-10 years;
- thirdly, to halt the capacity of AIDS burden to redress the skewed distribution of skills in the labour market.

The current options of replacement from within the labour market are limited. Thus,

- The current pool of skilled and highly skilled unemployed in the formal sector is very small
- Migration of skilled people to other parts of the world, is an added complexity to possibilities for replacement.

Immigration is obviously a possible consideration, although this may be hampered by the existing outflow of skills, as well as the stigma attached to high HIV risk economies. Technological substitution becomes an easy option for companies wishing to avoid the AIDS burden, especially at low skilled levels. There is also an assumption among many companies that given the pool of unemployed, replacement of unskilled workers may be fairly easy. However, drawing upon the unemployed may be more complicated than is often assumed (Cohen 2002), especially given the high HIV risk profile of the unemployed. Thus, labour and skills replacement may be more complex at all skill levels.

Overall, the existent structural inability in the South African labour market to increase the pool of sufficiently skilled employees may in fact exacerbate increased replacement needs of skill intensive sectors such as transport, manufacturing, chemicals, finance, government and health. In the absence of anticipatory succession planning and training, the skills deficit may worsen as the size and quality of the skill pool decreases faster than the skills replacement capacity. This compounds the possibility of a skill *cum* replacement deficit in the period 2000 to 2010. Further, Quattek (2000) argues that an AIDS-induced skills deficit may further contribute to obstacles to

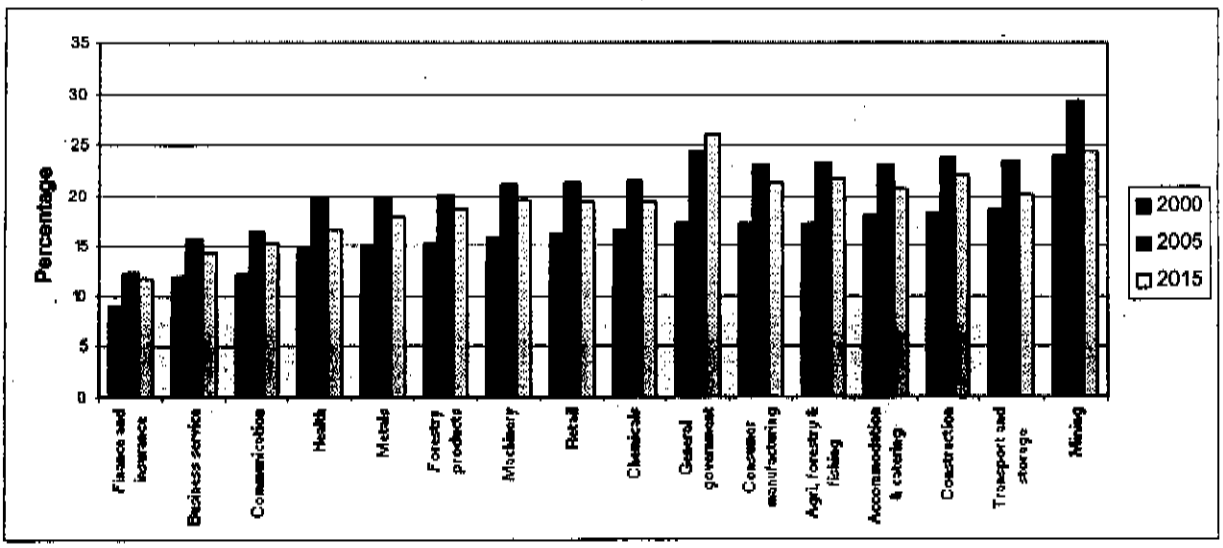
economic growth. Thus, building additional capacity to replace lost labour and skills remain the overwhelming challenge.

IMPACT ON FIRMS AND SECTORS

In this section an overview is provided of the potential effect on firms and sectors, from the limited data available. However, a good understanding of economic sectors, their skill profiles and linkages between sectors is fundamental to the understanding of the HIV/AIDS impact on labour supply in sectors.

Both national sector projections as well as selected company studies indicate that HIV/AIDS will differentially affect economic sectors. The ING Barings study has been criticised for overstating the extent of the sectoral epidemic. However, given the lack of comprehensive sector data, its findings are illustrated here. The projected results from the ING Barings study(Quattek 2000) show that HIV infection rates are generally high, likely to rise and peak in 2005 for most sectors, except the general government sector which only peaks in 2015. The highest rate of increase occurs in the period 2000-2005, declining afterwards. Figure 5 illustrates that the rate of HIV positive workers per 100 workers is highest in the mining, transport & storage, accommodation, agriculture, fishing & forestry and government sectors and lowest in the business sectors (Quattek 2000). The lowest rate of HIV positive workers is found in the finance, business and communication sectors.

Figure 5: HIV positive per 100 workers by selected main economic sectors (Quattek, 2000)



Source: ING Barings model as cited in Quattek 2000: 49

Table 8 summarises average HIV prevalence rates amongst companies, some of which derive from HIV prevalence surveys and others from actuarial projections. These confirm the sectoral distribution of HIV risk, but may differ in magnitude from the projections in Figure 6.

The ING Barings model does not adopt special sector-specific assumptions regarding risk profiles, suggesting potential over- or underestimations of the HIV susceptibility of these sectors in absolute terms. Mining companies for instance report HIV prevalence levels peaking around 40 per cent, substantially higher than that projected by the ING Barings model.

Table 8: HIV prevalence rates among selected companies/ sectors

Company/sample populations	Average HIV prevalence rate (%)	Approximate workforce size	Date
Anglo American	23%	134 000	2000
AngloGold	25-30%	44 000	2002
AngloPlatinum	7-24%	Not known	
AngloVaal Mining	14%	7 500	2002
Goldfields	26% 40%	Not known	2000 2009
Lonmin Platinum	26% 45%	8 000	2001 2005
Sasol	15%(estimate) 18 %(peak)	24 580	2002
Eskom	26%	38 000	2005
BMW	6%(estimate)	4 800	2001
Daimler Chrysler SA	9%(national)	4 840	2001
Agricultural workers in KZN	22.9%	5 000-10 000	1999
Sugarmill workers in KZN	27%	406	1999
Retail workers in KZN	7.9%	<1000	2001
Heavy industry	8.8%	>20 000	1999
Old Mutual	5%		2002
Banking(FirstRand, Absa, Nedcor & Standard Bank)	3.4%	29 490[a]	2003

Source: Various sources.

Most recently, a HIV prevalence survey among the four largest banking instutitions in SA(Nedcor, Absa, FNB and Standard Bank) showed a average HIV prevalence rate of about four per cent. This is considerably less than projected results for the financial sector by ING Barings at about 10.3 per

cent (Quattek 2000). This variation between modeled sectors results done by ING Barings (Quattek 2000) and survey results done by companies, and to a lesser extent sector survey results, are illustrated in Table 9, extracted from Van den Heever(2003).

Thus while there is some similarity in the estimated results for sectors such as Mining, Forestry, Metals, Machinery, and Transport , the modeled estimates for sectors such as Retail, Communication, Finance and Insurance, and General government are higher than those from company-based studies.

Table 9: Comparison of modeled and survey results on HIV prevalence by economic sector /company in South Africa

Sector	(Dorrington and Acott) (2002)	ING Barings (2002)	Rosen 2003 (2002)
Unemployed	28.7%		
Financial	3.0%	10.3%	
Government	12.6%	20.4%	
Industrial (light manufacturing)	12.6%	19.2%	
Industrial (heavy manufacturing)	16.0%	17.6%	
Industrial (wholesale)	7.6%		
Industrial (retail)	5.3%	17.7%	10.50%
Industrial (land and water transport)	22.5%		
Industrial (other)	16.7%		
Resources (forestry and coal)	17.2%		
Resources (gold and metal ore)	23.6%	23.8%	29%
Resources (petr. and metal manuf.)*	13.8%		
TMT (post and telecom)	6.0%		
TMT (IT and research)	1.1%		
Utility			7.90%
Agribusiness			23.70%
Metals processing		16.6%	23.60%
Media			10.20%
Business services		13.0%	
Health		16.7%	
Agriculture, forestry, fishing		19.3%	
Forestry products		16.8%	
Chemicals		17.5%	
Construction		19.9%	
Catering and accommodation		19.2%	
Transport and storage		19.5%	
Communication		13.7%	

Source: Dorrington and Acott as derived from provisional ratios that have not yet been published of sectors to national population as reported in Johnson *et al*, 2002a, p.23. Rosen 2003, ING Barings 1999. Extracted from Van den Heever, 2003).

Explanation to Table 9:

The comparative estimates are extrapolations from studies performed in a range of years prior to 2005. Their results were then extrapolated to a 2002 equivalent to more easily enable comparison.

ING Barings: These results are taken from ING Barings, 1999, p.16, and reflect projections based on extrapolations from assumptions on the HIV prevalence by skills group. The mix of skills groups by economic sector then results in the estimates for 2002. Use was made of the ASSA model for performing the projections.

Johnson: These results are taken from Johnson, 2002, p.22 and involve the unpublished provisional results of work by Dorrington and Acott. They are reported as very tentative.

Rosen: These results are taken from Rosen 2003, and represent firm level estimates of prevalence for the year 2002. The results are reported for the economic sector within which the employer falls.

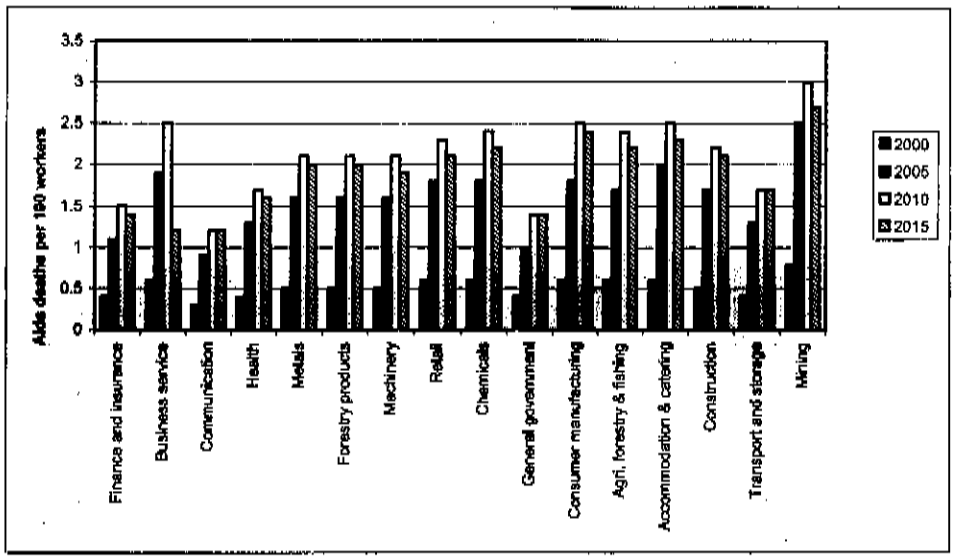
Source: Van den Heever, 2003.

Van den Heever(2003) suggests the following as the basis for the variablity as shown above:

- The methodology used by ING Barings, where an extrapolation of assumed HIV prevalence by skills group is performed, appear to overestimate potentially lower risk sectors.
- The firm-level surveys are generally based on relative small samples, and may not easily be extrapolated onto an entire industry.

Technically, the above comparison should really be regarded as indicative, rather than conclusive. The AIDS death rates in Figure 6 suggest that low risk sectors and companies are likely to experience better retention of existing skills and experience in the workforce and reduced labour turnover as fewer workers contract secondary infections, AIDS-related illnesses and die. The opposite applies to highly susceptible sectors and companies (Abt Associates Inc.et al. 2000).

Figure 6: AIDS deaths per 100 workers in main economic sectors (2000-2015)



Source:ING Barings model as cited in Quattek 2000: 49

The most significant losses of labour, preceded by increased illness-related absenteeism are likely to be concentrated in the period, 2000 to 2005, as the rate of increase in AIDS deaths per 100 workers is largest. This initial huge impact will be followed by similar, but relatively smaller waves of contraction in the workforce as the AIDS deaths ratio grows at a slower rate.

These are indicators that in the context of the existing skill shortage, those sectors that are dependent on scarce skills will experience increased cost vulnerability. Thus, while all economic sectors are vulnerable to increased AIDS costs, those employing unskilled and semi-skilled workers may have reduced benefit and replacement costs. On the other hand, low risk sectors, such as finance and communication, employing high skilled employees may face increased costs related to benefit and replacement costs. This is particularly important when considering the effect that this may have on critical economic sectors, such as those who create employment, engage in value added production or service activities, or has an export orientation.

Impact on Labour Demand

This section assesses the extent to which the impact of HIV/AIDS within the broader economy, as well as the cost burden of AIDS will impact on the overall demand for labour.

Understanding the National economic impact

Until 2001, there have been 3 studies conducted on the macro-economic impact in South Africa, including the macro-econometric studies by ING Barings(Quattek 2000), the Bureau for Economic Research(2001), and the CGE(Computable General Equilibrium) model by Arndt and Lewis(2000, 2001). These studies are based on the demographic results developed by the Actuarial Society of South Africa, while WEFA generated economic results for the ING Baring

study. More recently, the World Bank released a study on the macro-economic impact of HIV/AIDS, based on the human capital approach

With the exception of the World Bank study, all conclude that while the impact of HIV/AIDS will be negative for most economic indicators, it wil be 'gradual' and result in a relative small slowdown in real GDP growth. BER(2001) between 2002 and 2015, the predicted average decline in real GDP growth is at 0.5 % per annum. In comparison with a no-AIDS scenario, real GDP is projected to be 1.5 per cent lower by 2010 and 5.7 per cent lower by 2015. Compared to a non-AIDS scenario, the South African economy will continue to grow at an average rate of 3 % over this period (BER 2001:5), not much different from current rates.

ING Barings projects that real annual GDP will decline by 3.1 per cent in 2006-2010, whilst in 2011-2015 it is expected to decline by 4.7 per cent By 2015 the average year on year GDP growth will be 0.3-0.4 per cent lower than the comparable rate under a no-AIDS scenario (Quattek 2000). Arndt and Lewis (2000) predict that year on year GDP growth rates will decline to 1 per cent until 2008, with slight improvements into 2009 and 2010. By 2010 real GDP will be 17 per cent lower than a no-AIDS scenario. Further, per capita GDP is in fact expected to grow, given the greater decline in the population compared to that in GDP growth (BER 2001:38).

Overall then, when compared with current stagnant rates of growth (in and around 3% per annum), these predictions do not represent a 'doomsday' scenario, but rather modest declines in overall economic growth.

Impact on Employment and Unemployment

However, one of the main consequences of the decline in economic growth is a predicted decline in the demand for labour. BER (2001) as shown in Table 10 predicts that, when compared to a no-AIDS scenario, formal sector demand for skilled labour will be nearly 10 per cent less by 2015, whilst that for unskilled labour will be 3.3 per cent less in the same period. Moreover, it is argued that wage rates, especially at skilled level, will increase as a consequence of AIDS-related skill shortages. However, this will be offset by increased direct costs related to benefit payments by the private and public sector and productivity declines. The overall result is a decline in the demand for labour (BER 2001) and thus incomes.

Table 10: The Impact of HIV/AIDS on formal sector employment and unemployment (2002-2015)

Year	Formal sector Employment*		Unemployment rate(%)	
	Skilled	Unskilled	Level**	diffs
2002	0.4	2.0	41.8	-1.1
2005	-0.4	2.5	40.7	-2.5
2010	-3.8	1.1	35.8	-6.2
2015	-9.8	-3.3	28.7	-10.9

* % Difference in constant price levels of AIDS and non-AIDS scenarios; not year on year growth differentials

** 'level' is a percentage of the labour force outside of the formal sector in the AIDS scenario; diff is the % points difference compared to the no-AIDS scenario.

Source: BER 2001:38

Arndt et al. (2001) argue that labour demand under the AIDS scenario will be depressed due to:

- Reduction in economic growth;
- declines in the construction and equipment sectors(low skill intensive sectors);
- as a result of the morbidity effects among unskilled and semi-skilled workers.

All of these indicate that employment creation will suffer.

Thus, the disproportionately negative impact of HIV/AIDS on low skilled workers, will impact in turn on the demand for their labour, as low skill intensive sectors are more likely to be affected. Hence employment levels will not increase, whilst the unemployment rate will not change significantly. Arndt and Lewis (2000) predict that unemployment among the unskilled increases marginally, but will not result in major changes in the overall unemployment rate. This is largely due to the offsetting effect of the AIDS-induced reduction in the unskilled labour force and a reduction in labour demand due to slower economic growth.

There are some though, who argue that these predictions constitute an underestimation, and that the impact may in fact be much more severe (McPherson 2003, Bell, Shantayan and Gersbach 2003). Thus, McPherson et al (2000) argue that, in certain instances, HIV/AIDS impact has become an 'endogenous' factor to economies. However, macro-economic models tend to project AIDS vs non-AIDS scenarios, and treat HIV/AIDS as an exogenous factor, thus the potential underestimation of its impact. In addition, McPherson (2003) also argues that given the lag time between infection and AIDS death, the full impact of high AIDS mortality accompanying high HIV prevalence rates, has yet to be fed back through the economy. This, he argues will result in a loss of of critical institutions and economic networks' and a 'major collapse of investment' (2003:6).

The recently released World Bank analysis of the economic costs of HIV/AIDS and its application to South Africa tend to support this view. Its findings are in stark contrast to previous projections in that they predict an "economic collapse" within three generations, in the absence of effective intervention (Bell et al 2003). This model differs from previous ones, in that it considers human capital (the combination of skills, knowledge and experience) and places the inter-generational transfer of human capital from within families, at the core of the model. It argues that the premature deaths of parents will imply insufficient investment in education and the transfer of knowledge and skills in the younger generation, thus impacting negatively on the production potential of the economy in the long run. One of the co-authors, World Bank economist Shanta

Devarajan argues "If nothing is done to avert the epidemic then countries like SA, with that level of epidemic, could suffer a 50% decline in their per capita GDP over three generations; in about 90 years".

Much of the differences in these macro predictions may be ascribed to methodological and theoretical differences. Such stark outcomes are worrying though, and emphasises the need to develop more robust data and techniques for projecting the impact of HIV/AIDS.

Impact on Labour Cost Structure

Arndt et al (2000) and BER (2001) also argue that changes in total factor productivity will occur given increased business costs of mitigating the impact of HIV/AIDS. Table 11 illustrates the progression of HIV/AIDS through the labour force and potential impact in terms of the increased cost burden to companies and sectors.

Table 11: HIV/AIDS costs in the labour force

Timeframe	Projected effect on the workforce	Effect on company costs
Year 0	Initial infection	Prevention and awareness; peer counselling and training
Year 0-7	Morbidity begins (secondary infections, increased absenteeism, sick and compassionate leave)	Morbidity-related costs (e.g absenteeism, individual and workforce productivity, management resources, medical care and benefits)
Years 7 -10	Employee leaves workforce by resigning, retirement or death due to AIDS.	Termination –related costs including death benefits from retirement benefits, funeral costs, loss of morale, loss of skills and experience, loss of workplace cohesion.
Years 7-10	Company hires replacement employee.	Turnover costs including recruitment, training, loss in productivity.

Source: adapted from Rosen et al 2003.

The costs related to HIV/AIDS morbidity and mortality and increased labour turnover, losses in skills, experience and productivity are of a direct, indirect and systemic nature. Direct costs include:

- Employer and employee contributions to insured employment benefits, such as medical insurance, retirement, death, disability and funeral benefits;
- HIV/AIDS prevention and awareness, peer counselling etc.;
- Replacement costs related to the recruitment and training of new employees.

Indirect costs include:

- AIDS-related absenteeism, sick and compassionate leave;

- Productivity losses;
- Increased burden placed on both management and trade unions in consultation on HIV/AIDS.

Less quantifiable systemic costs include the loss of workforce experience, skills, morale and cohesion, as well the impact on external markets and other institutional impacts.

Impact on Labour Demand in Sectors

Aggregate labour demand of HIV/AIDS in different sectors will to a large extent depend upon the effect of HIV/AIDS on market demand, including the customer base, the type of products and services provided, investment perceptions, profitability and so forth. However, this is outside the scope of this review, and this section will focus on sector labour demand as mediated by the current trajectory of sector employment growth, as well as the extent to which internal labour demand has become more or less skill-intensive.

Thus, Bhorat (2003) argues that in the period 1995-1999, employment growth has been poor, and differed across sectors. The fastest growing sectors include the financial and business services sector, construction and internal trade. The mining sector suffered the greatest decline in employment growth, followed by community, social and personal services (mostly public services), utilities and agriculture.

At the same time, Bhorat(2003) argues that an analysis of the occupational distribution of employment gains and losses over the period, 1995-1999, shows that much of the job losses have been concentrated in unskilled, and to a lesser extent, semi-skilled occupations, while much of the employment gains have accrued to mostly highly skilled workers. Thus, in mining and agriculture, there has been an aggregate decline in employment, mostly concentrated among clerical staff, craft employees and elementary labour(2003:8). Similarly, the largest employment losses in the public services sector have occurred among low skilled workers.

It is evident that there is a clear overlap between the projected disproportionate burden of HIV/AIDS on low skilled workers, and the overall skills-biased trajectory of the shifts in employment across most economic sectors, in the recent past. Given the added cost –burden of AIDS, the evidence suggest that even in growth sectors, the demand for unskilled labour will continue to decline. At the same, across all sectors, despite the added AIDS cost burden of replacing skilled and highly skilled workers, the demand for these workers will continue to grow.

ESTIMATES ON SECTORAL HIV/AIDS IMPACT

As part of the HSRC project, a sector modelling methodology was developed by Alex van den Heever (2003b) in order to estimate the impact of HIV/AIDS on the main economic sectors. He

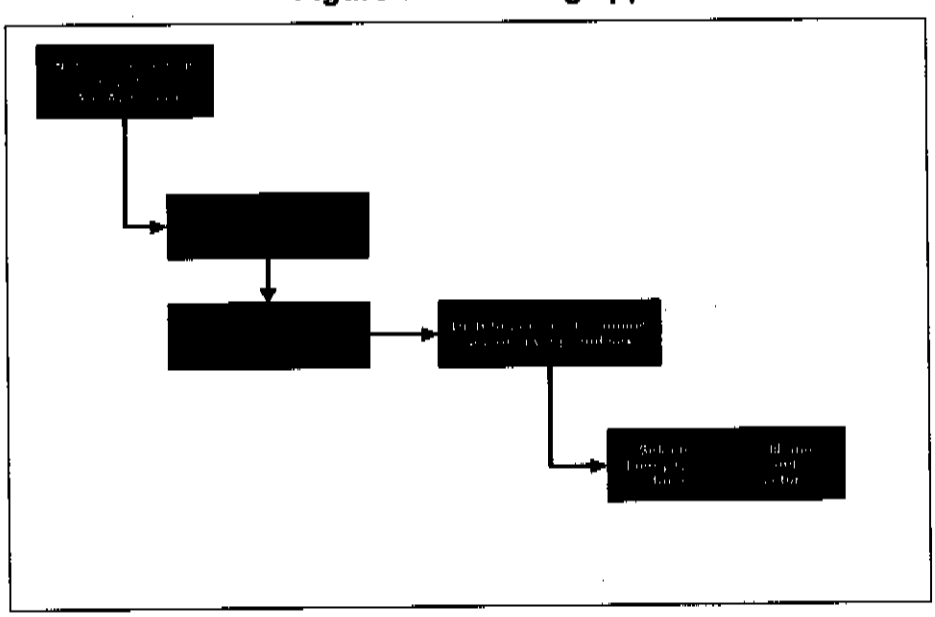
notes that sector modelling is one, but not the only means to determine the impact of HIV/AIDS on economic sectors in South Africa. Thus, it can "...isolate important issues and affect the ordering of priorities for any intervention. There is a substantial number of [intervening] variables influencing labour dynamics at any given time, including market demand, urbanization rates, education rates, health care provision, etc.."(2003b: 2). As such, the results should be regarded as "an extrapolation of existing information" rather than a "projection of likely events". The exercise did however make use of current survey information and the current state of knowledge on risk factors. There is still a paucity of survey data, at enterprise and sector level, which in future may be factored into a similar exercise and add to the increased validity of these findings. These estimates should be regarded as indicative, until the project has been able to conduct a sector survey, through these findings may be validated.

This section[4] provides a description of the methodology and selected results arising from the quantitative analysis. A fuller report is available. The projection methodology contains 3 main elements, a national demographic projects; followed by a sectoral analysis and finally a household analysis of the labour force investigated in the sectoral analysis. In this report, the first 2 elements are reported on.

Methodology: Modeling approach analysis

As shown in Figure 7, the sectoral analysis involves an *extrapolation* of the various risk groups from a standard projection of the ASSA2000lite model. Then these results are distributed by the four educational groups, employment status, age and sex. The main educational groups are: primary school only, high school only, matric and tertiary education.

Figure 7: Modeling approach



[4] This section is an extract from the relevant paper, Van den Heever, A.M.(2003) The Sectoral Impact of HIV/AIDS in South Africa: A Quantitative Analysis. Pretoria: HSRC and the Joint Center for Political and Economic Studies.

These demographic results are then used to construct the overlay for extrapolation onto skills groups onto the economic sectors. The structural breakdown of the educational make-up of each skills group is based on Census (1996), October Household Survey 1998, and the latest Labour Force Surveys.

The analysis then uses results from the HSRC survey (Mandela/HSRC, 2002) to distribute the national population projection into the four educational categories by age and sex. Certain assumptions are made (not detailed here) to distribute the results by educational category using the 1996 census (the absolute prevalence levels will however not be used, only their relative relationship to each other. The HSRC results on prevalence are adjusted proportionately upward to match the national prevalence estimates from the ASSA2000lite standard run, by age and sex, by employment status, using the three categories of employment status. (See Figure 7).

However, one of the limitations is that there is very little empirical data on the extent to which the employed, the unemployed and the not employed have different prevalence levels. Thus, for each educational group it is assumed that the *employed* and the *unemployed* have different prevalence rates. However, it is assumed that the *not employed* and employed have the same prevalence rates by age and sex. The use of the above differential is a starting position for the analysis. The approach allows for alternative differentials to be applied if empirical evidence can be found to reasonably justify an assumption.

Methodology: Household analysis

The household level study is performed only for the selected sector (motor vehicle parts and accessories manufacturers). The results of the broader sectoral analysis are related to household level information to provide an idea of the risk status of the households to which the employees belong. Only household types with at least one person employed in the selected sector is examined.

Information from the October Household Survey(OHS) allows a relationship to be created back to the household. Each individual covered in the survey is related to the head of household, and each individual has a unique identifier allowing their individual information to be linked to the same information for other individuals. Thus, the relationship of a person, by employment status, to the head of household is determined.

The household analysis involves the following:

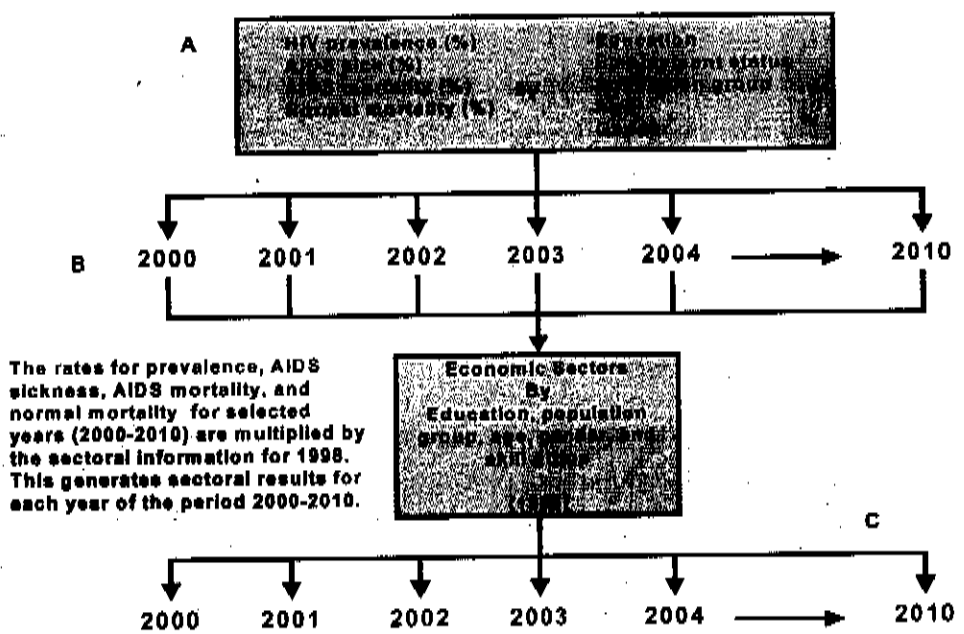
- ***Impact projections***: The household analysis provides only a limited review of the multi-year estimates of HIV/AIDS.
- ***Households by family type***: This is determined using the information provided in the OHS indicating the relationship to the head of household.

An age and sex structure is then created for each standard household type.

Results: Estimates on the HIV/AIDS Impact on Economic Sectors

Use was made of the October Household Survey of 1998 to provide a breakdown of the labour force in each economic sector according to their population group, educational level achieved, skill level, age and sex. The annual results provide rates for prevalence, AIDS sick, AIDS mortality, and normal mortality by education, employment status, population group, age and sex ('A' in **figure 8**) are then multiplied by the sectoral population breakdown ('B' in **figure 8**). This results in a breakdown of HIV prevalence, AIDS sick, AIDS mortality and normal mortality over the selected years (2000 to 2010) ('C' in **figure 8**).

Figure 8: Overview of methodology for estimating the HIV/AIDS impact on economic sectors



In order to limit the size of the final model, the annual estimates for each sector are calculated separately, and can be saved as a discrete file. Summary data are calculated by running each sector individually and the results are saved in a summary sheet.

Sector Results

A summary of the prevalence information is discussed here. The results largely appear to follow expectations, with the mining and agricultural sectors demonstrating the highest prevalence rates. In 2002 the rates are 24.2 percent and 22.3 percent for mining and agriculture respectively. Other significant sectors are Construction (Cons) at 20.3 percent, manufacturing of transport equipment (ManTrans) at 20 percent, and Household services (House) at 19.5 percent.

The sector, manufacturing of motor vehicles (ManMotVeh) shows a prevalence rate of 16.5 percent in 2002, growing to a peak of 18.2 percent in 2006, after which it declines. The manufacture of motor vehicle parts and accessories (ManMotParts) comes out with a lower prevalence than the manufacturing sector with a prevalence of 13.4 percent in 2002, peaking at 15.1 percent in 2006.

The sectors showing the greatest overall number of estimated HIV positive individuals are Agriculture (211,482 in 2002), Community Services (Com) (245,598 in 2002) and Wholesale and Retail (WholeRet) (214,425 in 2002). Mining stands at 104,943 in 2002 which is lower than Household services at 151,064 in 2002.

The motor vehicle manufacturing sector has an estimated 5,586 HIV positive employees in 2002, growing to 6,161 in 2006. The sector, manufacturing motor vehicle parts and accessories, has an estimated 4,354 HIV positive employees in 2002 growing to 4,906 in 2006.

The results in this section provide an overview of estimated prevalence rates and numbers by economic sector, as shown in Table 12 and Table 13. Similar to other studies, these estimates vary by sector, even though the actual rates and numbers may differ.

Table 12: HIV prevalence results by sector (percentage)

	2000	2002	2004	2006	2008	2010
Agr	18.9%	22.3%	24.1%	24.6%	24.1%	23.0%
Min	20.7%	24.2%	25.8%	26.1%	25.4%	24.1%
ManAir	6.7%	8.9%	10.3%	10.8%	10.2%	9.0%
ManMetals	14.6%	17.4%	18.9%	19.3%	18.7%	17.6%
ManMotBodies	15.7%	19.3%	21.3%	22.0%	21.3%	19.6%
ManShips	5.1%	6.4%	7.5%	8.4%	8.8%	8.9%
ManCoke	14.5%	17.1%	18.5%	18.8%	18.4%	17.4%
ManElecMach	13.1%	15.8%	17.2%	17.5%	16.9%	15.7%
ManFood	15.5%	18.4%	20.0%	20.4%	19.9%	18.8%
ManFurn	15.4%	18.3%	19.9%	20.3%	19.7%	18.6%
ManMotVeh	13.7%	16.5%	17.9%	18.2%	17.4%	16.1%
ManNon-Met	17.4%	20.5%	22.2%	22.6%	22.0%	20.9%
ManMotParts	11.0%	13.4%	14.8%	15.1%	14.7%	13.6%
ManRad	6.7%	8.0%	8.7%	8.9%	8.6%	8.1%
ManRail	6.0%	6.9%	7.5%	7.7%	7.8%	7.8%
ManTextCloth	13.0%	15.6%	17.2%	17.7%	17.4%	16.5%
ManTrans	17.6%	20.0%	21.3%	21.8%	21.7%	21.5%
ManWood	13.5%	16.1%	17.5%	17.8%	17.3%	16.3%
Elec	14.5%	17.2%	18.7%	18.9%	18.3%	17.0%
Cons	17.3%	20.3%	21.9%	22.2%	21.7%	20.7%
WholeRet	14.0%	16.7%	18.1%	18.5%	18.2%	17.3%
Trans	14.0%	16.7%	18.1%	18.4%	17.9%	16.8%

	2000	2002	2004	2006	2008	2010
Fin	10.2%	12.1%	13.2%	13.5%	13.3%	12.6%
Com	11.5%	13.9%	15.3%	15.8%	15.4%	14.4%
House	16.0%	19.5%	21.7%	22.5%	22.2%	21.0%

Table 13: HIV infection results by sector (numbers)

	2000	2002	2004	2006	2008	2010
Agr	179,574	211,482	228,385	233,214	228,571	218,413
Min	89,809	104,943	112,308	113,610	110,371	104,673
ManAir	146	195	226	235	224	198
ManMetals	36,328	43,327	47,039	47,939	46,530	43,681
ManMotBodies	952	1,167	1,290	1,328	1,287	1,189
ManShips	45	57	66	74	78	79
ManCoke	21,986	25,952	28,034	28,562	27,866	26,460
ManElecMach	3,379	4,071	4,443	4,526	4,365	4,045
ManFood	41,471	49,372	53,649	54,802	53,404	50,445
ManFurn	6,593	7,844	8,509	8,679	8,452	7,980
ManMotVeh	4,654	5,586	6,073	6,161	5,914	5,453
ManNon-Met	15,589	18,414	19,908	20,297	19,788	18,730
ManMotParts	3,574	4,354	4,788	4,906	4,746	4,399
ManRad	573	686	748	763	740	695
ManRail	19	23	24	25	25	26
ManTextCloth	31,370	37,720	41,454	42,765	41,959	39,735
ManTrans	439	501	532	544	543	537
ManWood	19,209	22,866	24,812	25,301	24,605	23,192
Elec	15,058	17,929	19,409	19,693	19,004	17,719
Cons	81,003	95,223	102,446	104,188	101,760	97,006
WholeRet	180,466	214,425	233,106	238,775	233,789	222,198
Trans	68,103	81,146	88,038	89,694	87,109	81,931
Fin	78,267	93,143	101,320	103,797	101,607	96,502
Com	203,134	245,598	270,240	278,153	271,393	254,778
House	123,738	151,064	168,038	174,734	171,972	162,434

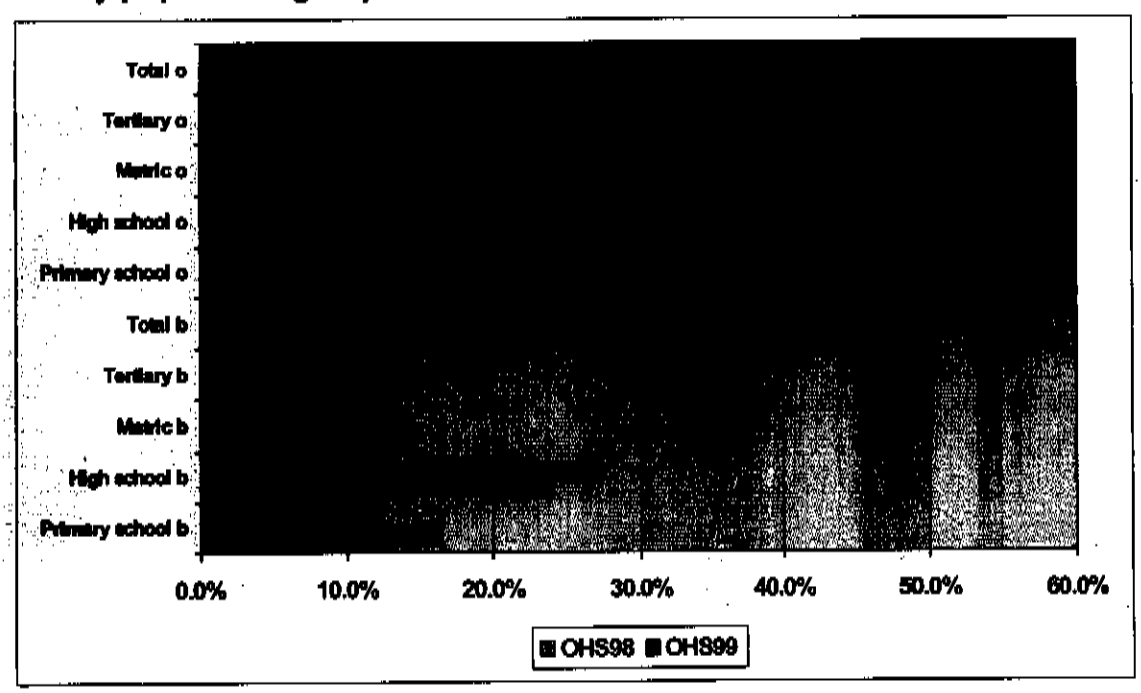
In order to gain a better understanding on more detailed dynamics within these sectors, an analysis of the *motor vehicle parts and accessories manufacturing sector* follows.

Impact of HIV/AIDS on the Motor Vehicle Parts and Accessories Manufacturing Sector

The purpose of this section is to provide more detail and results of the potential impact on labour of HIV/AIDS on a selected economic sector. The sector, motor vehicle parts and accessories manufacturing (MVPA), is chosen, as it will be the focus of a subsequent prevalence survey.

An analysis of the demographic profile of employees in the MVPA sector is based on the 1998 OHS. The estimated number of MVPA employees, however, is not regarded as reliable due to the sample size of the survey and that it differs considerably from that in the 1999 OHS (32,386 in OHS 1998 and 21,153 in OHS 1999) as shown in Figure 9. The proportions by population group, educational status, sex, and age also varied – although the basic structure remained fairly similar for both surveys. These differences are relevant to the final HIV/AIDS impact estimates and are discussed below. For the purposes of this analysis, however, the data from the 1998 OHS are focused on.

Figure 9: MVPA – comparison of the proportional breakdown of employees by population group and educational status between the OHS 1998 and 1999



Overall the black population is roughly 50 percent of the total employed population in the MVPA sector, although the employment by educational status varies significantly between the two. Virtually all the employees with a primary school education only occur in the black population (5,269 blacks compared to 393 "other").

Only 10.1 percent of all black employees are female - most of whom have a high school education. Most black employees have a high school education, virtually all of whom are male.

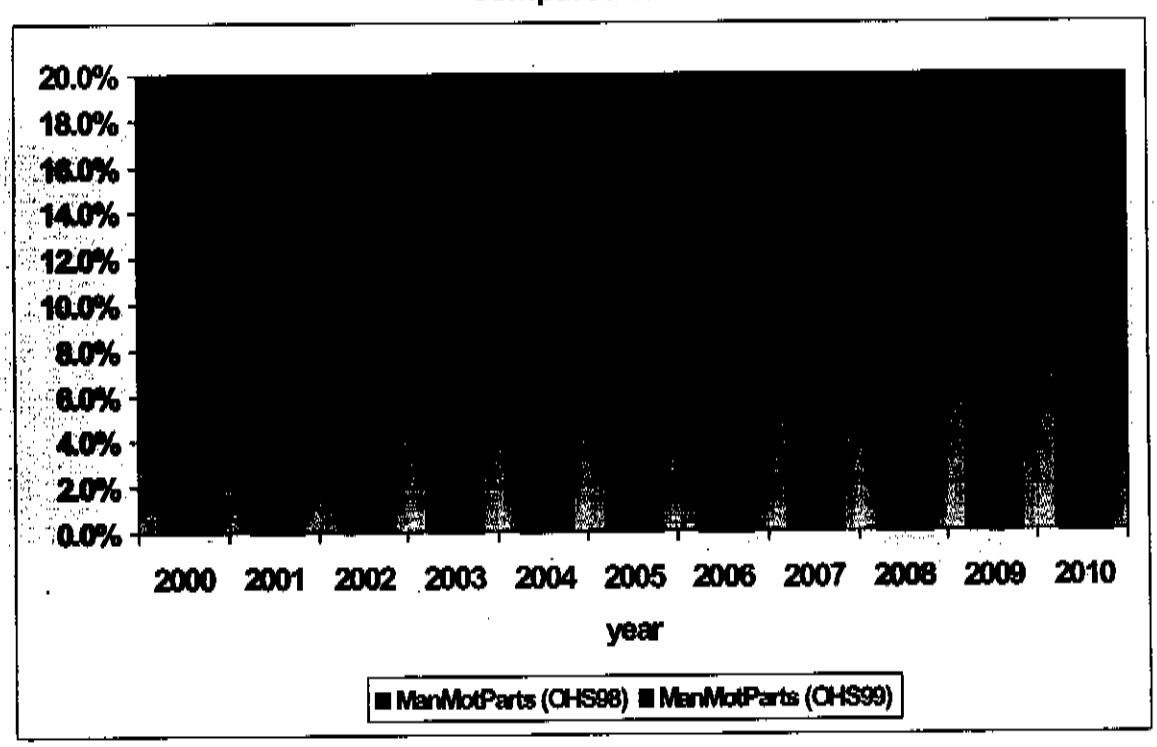
Most of the "other" population groups have a high school education (7,092), but the majority (59.7 percent) have more than a high school education with as much as 19 percent with a tertiary education.

The "other" population groups are also more represented by females (34.4 percent to the total) most of whom have only a high school education. Here only 9.4 percent have a matric and 1 percent a tertiary education. It is interesting to note that for the "other" population group, there are more males with a tertiary education (18.3 percent of the total) than with only a high school education (17.9 percent of the total). Males with a matric constitute 27 percent of the total "other" employees. The black population in the MVPA sector is thus generally less educated, with fewer females than the "other" population group.

HIV/AIDS Results for the MVPA sector

Overall HIV prevalence for the MVPA sector is estimated at roughly 11 percent in 2000 when the OHS 1998 is used, rising to just over 14 percent by 2004. Thereafter it remains roughly constant till 2007, after which it declines to just fewer than 14 percent by 2010. The estimates are higher when the OHS 1999 is used, showing a rise from just fewer than 14 percent in 2000 to a high of around 17 percent by 2004. The difference resulting from the variations in the two surveys is thus fairly significant. For the remainder of this section, however, the results for the 1998 OHS are presented.

Figure 10: MVPA: HIV prevalence for the years 2000 to 2010 OHS 1998 compared to OHS 1999



The overall prevalence for males exceeds that for females when all the results are aggregated. In 2003 males are estimated to experience overall prevalence of 15.8 percent compared to 8.8 percent for females. This declines slightly to 2010 to 15 percent for males and 8.8 percent for females. Much of this has to do with the greater representivity of blacks in the higher risk educational categories, as shown in Table 14. The age categories with the highest prevalence are 25-29, 35-39 and 40-44. Interestingly where the prevalence rates decline for the 35-44 age groups by 2010, they actually increase for the 25-29-age category.

Table 14: MVPA - HIV/AIDS prevalence estimates for the period 2003 and 2010

	AGE	2003			2010		
		Males	Females	TOTAL	Males	Females	TOTAL
HIV Positive rates %	15-19	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	20-24	6.5%	9.6%	6.8%	7.0%	10.5%	7.3%
	25-29	19.9%	10.9%	18.3%	21.3%	11.3%	19.5%
	30-34	8.3%	10.0%	9.2%	8.6%	9.3%	9.0%
	35-39	20.4%	13.5%	18.4%	18.3%	12.0%	16.4%
	40-44	23.8%	6.4%	17.7%	19.1%	5.9%	14.5%
	45-49	16.7%	11.1%	15.8%	14.0%	13.3%	13.9%
	50-54	11.3%	2.1%	9.8%	11.1%	4.7%	10.0%
	55-59	9.7%	0.0%	9.7%	12.5%	0.0%	12.5%
	60-64	5.9%	0.0%	5.9%	11.8%	0.0%	11.8%
	65-69	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	>=70	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	TOTAL	15.8%	8.9%	14.2%	15.0%	8.8%	13.6%

Table 15 provides a summary of the results for estimates of the number of employees HIV positive, AIDS sick and likely to die from AIDS in the years 2003 and 2010 by age and sex. It should be noted that these estimates are affected by the estimate of the total employees in the sector based on the OHS 1998. The totals should therefore be treated with caution.

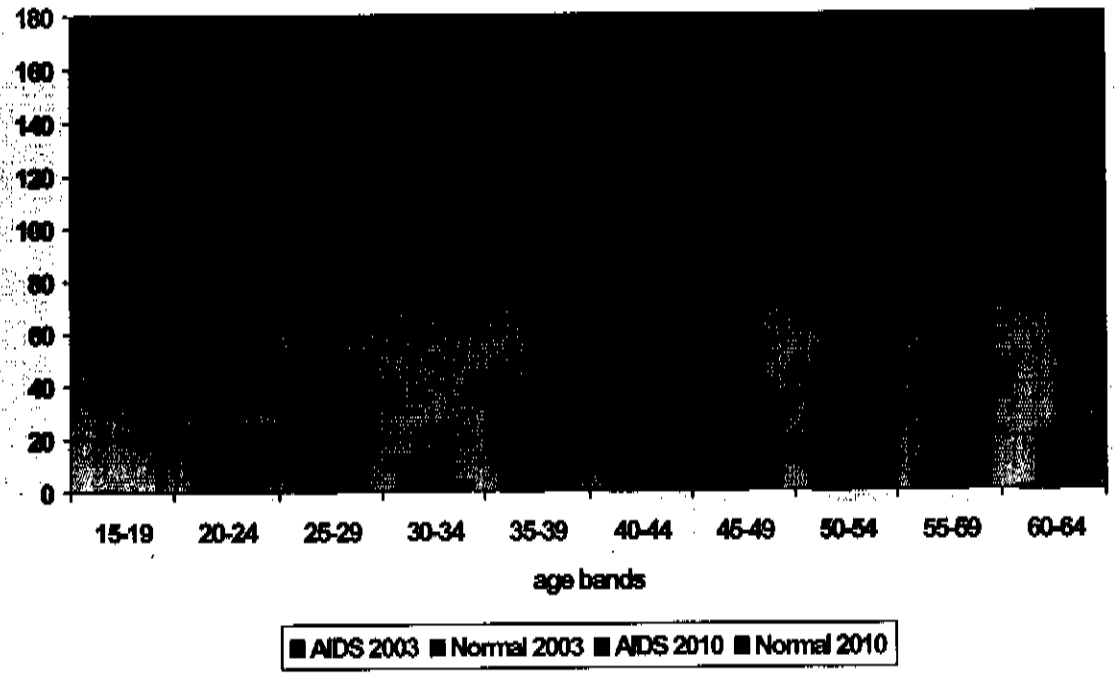
Whereas the number of HIV positive employees is expected to decline slightly, from 4,613 to 4,399, the numbers AIDS sick and estimated to die from AIDS will more than double. Those AIDS sick will increase from an estimated 325 in 2003 to 712 in 2010. Those expected to die from AIDS will rise from 217 in 2003 to 475 in 2010.

Table 15: MVPA - HIV/AIDS estimates for the period 2003 and 2010

	AGE	2003			2010		
		Males	Females	TOTAL	Males	Females	TOTAL
HIV Positive	15-19	0	0	0	0	0	0
	20-24	233	28	261	250	31	281
	25-29	848	104	952	904	108	1,012
	30-34	101	121	222	104	113	217
	35-39	588	161	749	526	144	670
	40-44	1,158	167	1,325	933	154	1,087
	45-49	491	63	554	412	75	488
	50-54	309	12	321	303	26	329
	55-59	200	0	200	258	0	258
	60-64	28	0	28	57	0	57
	65-69	0	0	0	0	0	0
	>=70	0	0	0	0	0	0
	TOTAL	3,958	655	4,613	3,748	651	4,399
AIDS Sick	15-19	0	0	0	0	0	0
	20-24	1	1	2	2	1	3
	25-29	23	6	29	38	13	51
	30-34	6	10	15	12	21	33
	35-39	51	16	68	108	34	142
	40-44	106	16	122	209	36	245
	45-49	41	6	46	86	18	103
	50-54	25	1	26	65	6	71
	55-59	15	0	15	52	0	52
	60-64	2	0	2	10	0	10
	65-69	0	0	0	0	0	0
	>=70	0	0	0	0	0	0
	TOTAL	270	56	325	582	130	712
AIDS Mortality	15-19	0	0	0	0	0	0
	20-24	1	1	1	1	1	2
	25-29	16	4	19	26	9	34
	30-34	4	6	10	8	14	22
	35-39	34	11	45	72	23	95
	40-44	71	11	82	139	24	164
	45-49	27	4	31	57	12	69
	50-54	16	1	17	44	4	48
	55-59	10	0	10	35	0	35
	60-64	1	0	1	7	0	7
	65-69	0	0	0	0	0	0
	>=70	0	0	0	0	0	0
	TOTAL	180	37	217	388	86	475

AIDS mortality is already estimated to be greater than normal mortality in the 35-44 age categories, where it is also expected to more than double by 2010. However, for all other age categories, except 45-49, normal mortality exceeds AIDS mortality both in 2003 and 2010. Most AIDS-related deaths are estimated to occur in the 35-49 age category until 2010(See Figure 11).

Figure 11: MVPA: AIDS and normal mortality, 2003 and 2010



Discussion of Findings

The quantitative analysis carried out in this report, and specifically in this section contains a number of artificial assumptions that prevent any of the estimates produced from being regarded as projections. The following are important to note:

- The HIV/AIDS projection do not account for the impact of behavioural change, future and current interventions (such as treatment).
- The "demand" for labour is assumed as independent of supply issues. This arises from the assumption that a constant labour force structure by population group, educational status, age and sex occurs throughout the estimation period. Thus, only the employees in a base year (based on the October Household Survey) are analyzed (depending upon which survey is used).

- No account is taken of the influence the households from which the employees are drawn which may affect HIV/AIDS risk. This will be very important where the type of employment does not have a causal relationship to the epidemic. As such, more general risk factors in the community, independent of the employer would be important.

Given the above qualifications it is important to identify what information is actually conveyed by the exercise in this and the earlier sections. The following can be identified as particularly important:

- The black population employed within the MVPA sector is generally of a higher risk of HIV/AIDS infection than the "other" population groups. This relates primarily to the educational groups employed. However, it is not clear that the assumptions concerning risk by educational status will hold if full account could be taken of the community circumstances of the Black population that may serve to reduce risk.
- The impact of employee benefits and public sector provision of antiretroviral treatment may impact on the prevalence and mortality experienced by this sector. In the absence of this, the impact will primarily be felt in lower educated employees in the semi-skilled and unskilled part of the workforce within the black population (35.2 percent of the overall workforce).
- Surveys on the Motor Vehicle Manufacturing sector reveal prevalence estimates that range between 6 and 10 percent for 2002, as shown in Table 16. This varies considerably from the 16.5 percent resulting from the approach used in this report. It may be that prevalence in the MVPA sector is similarly lower than estimates provided in this section. However, the reason for the lower estimates in the Motor Vehicle Manufacturing sector will only become clearer through an analysis of the detailed information from the surveys.

Table 16: Reported HIV prevalence rates in the assembly sector

Company	Type of assessment	Sample size/population	Year of assessment	Prevalence (%)
Daimler/Chrysler	Prevalence survey	1 400 employees (79% response rate)	Oct 2001	9.5%(average)
VWSA	Prevalence survey	Not available	2002	5%(average)
BMW	VCT	1949(63% response rate)	May 2003	5%(average)
Delta	Prevalence survey	Not known	2001/2	5%
Ford	VCT Actuarial assessment	2900 employees(25 % response rate)		Not available

Company	Type of assessment	Sample size/population	Year of assesment	Prevalence (%)
Toyota	-	-	-	Not available
Nissan	-	-	-	Not available

Sources: World Economic Forum 2002a, 2002b.

This section provides some additional insight into the potential HIV/AIDS risk that could be faced by the MVPA sector.

OVERVIEW OF RESPONSES IN THE PRIVATE SECTOR

The capacity of intervene effectively and mitigate the impact of HIV/AIDS is fundamental to reverse some of the trends described in this paper. Much of the literature however, indicates that those enterprises and categories of workers that are generally on the margins of the labour market and the formal economy will have less capacity to deal effectively with the negative impact of HIV/AIDS. The following section reviews the aggregate responses of companies in the formal sector, and the particular dynamics especially regarding SMMEs. A special focus is placed on the auto sector, in that it is a critical economic sector identified in this project.

Company Responses in the Private Sector

A survey initiated by the SA Business Coalition on HIV/AIDS [SABCOHA] (Deloitte and Touche 2002) shows that only 27 per cent of 110 surveyed companies have conducted a HIV/AIDS risk assessment, which usually entails an actuarial exercise to determine exposure to increased AIDS-related costs, and indirectly measure of HIV prevalence. At the same time, less than ten per cent have conducted a HIV prevalence survey through unlinked blood or saliva screening.

Overall, these findings point towards rather slow uptake of opportunities to assess the extent to which HIV will impact on the company. At the same time it also highlights that the actuarial risk assessment or indirect impact measurement is preferred rather than the testing route. It is commonly argued in management circles that the workforce may resist testing, large due to the stigma attached to HIV status. The role of trade unions in this regard is also not clear, in the absence of a clear HIV/AIDS policy, fears related to possible discriminatory practices in regard to knowledge of HIV status may remain. In addition, in some cases, companies interpret restrictions on HIV testing, in terms of the NEDLAC code of good practice on HIV/AIDS in the workplace, as a complete ban outlawing voluntary, unlinked and anonymous HIV testing (Heywood 2000). However, in the last couple of years, company-based HIV prevalence surveys, including biological testing, are reported more often. This is largely as a result of an increased knowledge and awareness, as well as reassurances of confidentiality and anonymity towards the workforces involved. With the advent of medical care and treatment provided, or subsidized by companies, surveys by the disease management companies have become more common.

The SABCOHA study (Deloitte and Touche 2002) also shows that, while more than half of the surveyed companies had a formal HIV/AIDS policy, smaller companies lagged behind in this regard. Thus, 80 per cent of large (more than 500 employees) companies had a policy, as opposed to 6.5% of smaller companies (100 and less employees). There is also the perception that in the face of a lack of visible evidence (for e.g increased deaths, illnesses) due to the incubation period between initial HIV infection and the onset of AIDS, companies do not regard the situation as serious. This is especially so with regard to unskilled employees, who are regarded as easily replaceable

In this context, companies obviously do not have a concrete sense either of the susceptibility of their workforces, or the vulnerability of their businesses in terms of the total cost impact. The point is underscored when a related finding from the SABCOHA survey shows that about half of the surveyed companies anticipate a 'moderate' impact, whilst only five per cent expect HIV/AIDS to have an 'extreme' impact on their companies (Deloitte and Touche 2002).
Since 2003, however, some shifts have occurred as captured in follow up surveys by SABCOHA (BER 2003). It shows that more companies, especially manufacturing companies are reporting a perceived increase in the impact of HIV/AIDS. However, despite this, there has not been a significant shift in the extent to which companies, especially smaller companies are responding in a more pro-active manner. Thus, for the period 2003-2004, 13% and 17 % of smaller companies had a HIV/AIDS policy, whereas medium-sized companies remained at just over 60%. Only 14% of all companies had conducted an assessment of the impact on their workforces; 8% on production costs; and 6% on the consumer base. It is evident that the responses of companies are not necessarily knowledge-driven. This may partly be attributed to the costs of such exercises, as Connelly and Rosen(2004) show that the demand for HIV/AIDS services among small and medium-sized companies are low, and not affordable.

While the standard response of most companies has generally been one of cost-avoidance, some shifts have occurred. Thus, more recently, in sections of the private sector, there seems to be an increasing appreciation that the long-term benefits of treatment and care, which may include the provision of anti-retroviral drugs to infected employees and/or their spouses, may outweigh future AIDS-related costs. Recently a number of large, mainly multinational companies such as Anglo American, De Beers, British Petroleum (BP), Old Mutual announced such intentions.

The general policy approach underlying intervention is to reduce direct costs, including medical expenses and pension and death benefits, and indirect costs such as illness-related absenteeism and replacement costs (Anglo American 2002). AngloGold reports that the implementation of prevention therapy can reduce mortality risk by 46 per cent and hospitalisation by 43 per cent (AngloGold 2002).Thus, the second underlying objective is to extend the productive lives of infected workers, thereby containing potential productivity losses and labour turnover in

lossess in skills and experience. The mining sector, the worst affected sector has been most active in this regard. Mining recruitment from neighbouring Southern African countries has also declined. Whilst this may partially be attributed to real restructuring in the mining industry, the high HIV prevalence levels in neighbouring countries may also play a role in this regard.

Thus, whilst mostly a cost saving measure, it effectively retains the current stock of skills and experience, by the possibility of extending the productive lives of infected employees. These interventions have the potential of slowing down the waves of cumulative losses of labour supply, as argued earlier on.

However, this is not a widespread approach, confined to large companies, and unevenly spread across the economy. Rosen et al. (2001) argue that the private sector has not invested sufficiently in HIV/AIDS, and instead has been shifting the AIDS cost burden towards households, non-governmental organisations and government. Anecdotal evidence suggests that medium and small companies may not be able to afford these interventions, nor do they adequately appreciate their individual risk burden.

Also, given the recently announced roll-out of state-funded HIV/AIDS treatment and care programme, it is not clear how some of these private sector initiatives will complement one another.

The Impact on SMEs and the Supply Chain

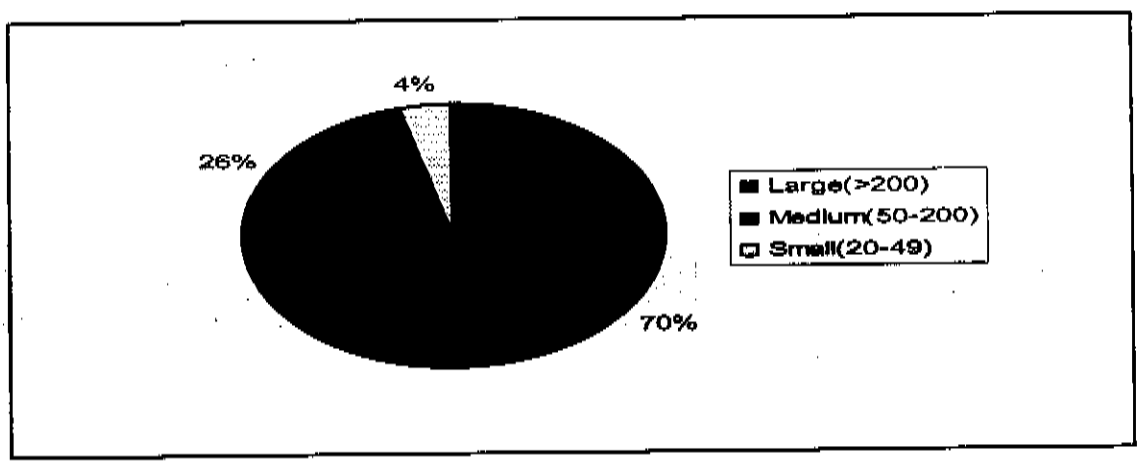
One of the key outcomes of the private sector response to the impact of globalisation and the re-entry of South African business to global competitive environment has been the restructuring and rationalisation of production and/or service activities. Many large South African firms are increasingly restructuring operations in order to focus on their core activities, and outsource to smaller companies their ancillary and intermediate activities, which may include mostly service and sometimes even production activites.

In this process, larger companies are increasing the economic pie, but indirectly may also be increasing the level of HIV risk experienced by SMMEs as well as the workforce they employ. While very little is known about HIV prevalence rates among these companies, there is a number of general indicators of possible risk exposure and cost vulnerability.

The demographic profile of SMMe's may be different, with different HIV risk dynamics; in the absence of concrete evidence very little can be concluded about this. However, more often than not, SMMEs employ low skilled workers, with poorer conditions of employment and lower wages, so that the lower socio-economic status may contribute to increased risk of HIV exposure. Also, in order to control labour costs, these companies tend to employ more atypical workers on a casual, contract or temporary basis. Current evidence shows that such workers are more likely to display higher HIV prevalence rates(Evian et al 2001), as a result of an unstable lifelstyle induced by unstable incomes, creating the conditions for risky sexual behaviour.

Moreover, vulnerability to the increased costs of HIV/AIDS may also differ along the supply chain. Thus, unlike most SMMEs, many large, formal and mainly multinational companies have been able to develop relatively comprehensive responses to HIV/AIDS in terms of education and awareness, and can afford to provide treatment and care to infected employees, and even to their families. Thus, a study on the purchase of HIV/AIDS services (such as prevalence surveys, development of workplace policy, voluntary counselling and testing and so forth) for SMEs show that is overwhelmingly consumed by large companies(>200), as shown in Figure 12. The low levels of HIV/AIDS service consumption by small and medium sized companies are an indication of their relative failure to mitigate the impact of the epidemic. This relates particular to the prevention of new HIV infections, through effective prevention and awareness activities, among the cheapest forms of prevention.

Figure 12: Purchasing of HIV/AIDS services by company size



Source: Connelly and Rosen 2003

Further, enterprise infrastructure such as occupational health facilities plays a fundamental role in the fight against the epidemic. Thus, large well-established companies, such as the auto sector and the mining sector, can now provide generalised health services including testing for STDs, one of the key co-factors in HIV transmission. Small and medium-sized companies generally would not be able to afford such infrastructure, lowering their defences against the disease.

In terms of local supply chains, this unevenness in terms of knowledge of HIV risk, the management and cost thereof, may represent a weakness for large companies as well. Thus, while the latter may know and determine their own risk exposure – they may run the risk of production disruptions as a result of ignorance of, and lack of management of HIV risk in other parts of their supply chains. Thus, individual company HIV/AIDS costing is a necessary, but not a sufficient indicator of overall HIV risk, especially insofar as it relates to that arising from suppliers and distributors. Those relying on the local supply chains in order to service export contracts (including

mining, automotive, tourism, agriculture, steel etc.) may find that their individual HIV/AIDS resource allocation may be inappropriately targeted, based on insufficient supply chain information. In the automotive sector, there are attempts to integrate AIDS responsiveness as a factor in the procurement process. It also provides an opportunity to disseminate best practice approaches among small, medium sized businesses.

The relative exposure to HIV/AIDS and their response thereto will become an important element in securing foreign and domestic investment. Thus, in future, local private companies will be required to disclose their HIV/AIDS risk exposure and management strategies in their annual financial reports. This flows from recommendations from the second King Report on Corporate Governance, the Promotion of Access to Information Act, 2000, as well as the SA Institute of Chartered Accountants and the Johannesburg Securities Exchange (JSE). This has major monitoring and evaluation consequences, and it is not clear what mechanisms will be put into place to assess progress. Further, non-listed companies may not be subject to the same scrutiny and needs to be brought under scrutiny. This has implications though for the extent of regulation that SMMEs be subjected to, especially in regard to complaints of over regulation and demands for the exclusion of SMMEs from certain labour market regulations in order to ease barriers to entry.

OVERVIEW OF HIV/AIDS RESPONSES IN THE AUTO SECTOR

This section seeks to provide an overview of HIV/Aids approaches in the automobile sector. It provides an overview of the nature and extent of intervention. Much of the discussion is based on information in the assembly sector, given the relative absence of information for component manufacturers. This presents a major constraint in providing a coherent assesment of dynamics across the supply chain. However, a recent study by the Automotive Industry Development Centre(AIDC) on HIV/Aids in the Gauteng automotive industry confirmed these trends. Thus, in a study of tier one companies, that is suppliers to the assembly industry, showed that most did not have any workplace-based HIV/Aids programmes, whereas all of the surveyed assemblers had active workplace programmes (AIDC 2003).

Policy approaches in the Assembly sector

All of the assemblers have a HIV/Aids policy in place, and most indicate that the policy- champion is more likely to be located at senior management level. These generally include the rollout of education and awareness programmes as well as the training of peer educators. All assemblers have conducted risk assessments, whilst 3 have conducted sero-prevalence surveys, including Daimler-Chrysler, Delta and VWSA. All companies have VCT (Voluntary Counselling and Testing) programmes. Testing response rates vary widely from as high as 63 per cent (BMW) to lower than 25 per cent at others. As these are predominantly large companies, most also have occupational health facilities on site. However, in most cases the provision of treatment and care are outsourced

to medical aid schemes such as Aid for Aids programme. The take-up rates of HIV treatments also vary.

None of the assemblers reported a noticeable impact on productivity, performance or absenteeism. Thus, BMW SA indicated that it has not experienced a noticeable impact on business productivity, performance or absenteeism. This it ascribes to a relatively stable and older workforce with considerable years of experience and stable supply sources for labour recruitment. In 2002, the company reported 2 deaths that could be attributed to Aids-related causes (BMW interview 2003). Finally, the overall perception within management is that given the combination of intervention programmes as well as the profile of the workforce, Aids is not regarded as a competitive risk in the sector.

The following range of interventions are provided by most assemblers:

- Formalised HIV/Aids policy
- Prevention and awareness
- Peer education
- Condom distribution/promotion
- VCT(Voluntary Counselling and Testing)
- KAP assessment(Knowledge, Attitudes and Perceptions/Practices)
- Treatment of STIs
- Wellness programmes(nutritional support, exercise etc)
- Treatment of opportunistic infections
- HAART(Highly Active Anti-retroviral treatment)

Policy approaches in the Component manufacturing sector

Most of the large component companies belong to the non-statutory industry association, NAACAM and are more likely to have some exposure to HIV/Aids awareness and prevention activities. However, small to medium sized companies are more likely to operate as private operators, independent of the influence of industry associations. AIDC (Automotive Industry Development Corporation) is currently rolling out a programme of education and awareness in the Gauteng component companies.

Many of the large component companies are foreign-owned, and may also be locked into relationships with local assemblers. This link, one assumes may have a positive spin-off effect in terms of exposure to HIV/Aids intervention activities. However, a baseline study by the AIDC shows that most of the Tier One respondents in Gauteng, that is, suppliers to local assemblers,

had no HIV/Aids policies in place. This also implies that Tier 2 and 3 suppliers, already marginalised within the industry (as discussed earlier) are even less likely to have such policies in place. Similarly, a study of 26 KZN automotive component manufacturers, as shown in Table 17, shows that most members did not have integrated HIV/Aids policies and preventative programmes as part of their Human Resource Development strategy, nor are they on a par with best practice examples (KZN Benchmarking 2002).

Table 17: Proportion of automotive component companies with best practice HIV/AIDS interventions – 2001/2 (n=26)

Best practice interventions	% Club members with interventions in place
Formalised HIV/AIDS policy	55.6
Focal HIV/AIDS person	55.6
Peer education programme	55.6
Management awareness programme	61.1
STD awareness programme	61.1
Condom distribution	72.2
Occupation health services	77.8
Community support programme	38.9

Source: Cited in KZN Benchmarking Club 2002

It is also interesting to note that most of these companies form part of an international Benchmarking Club as they adopt, or are in the process of adopting best practices in order to fulfill global competitiveness requirements. Further, whilst most of the assemblers may have the intention to roll out HIV/Aids related programmes to their suppliers, this is not yet in place.

Increasingly though, there is the realisation that in order to ensure the smooth operation of the supply chain, large assemblers may have to provide more support in HIV/Aids management in the component industry. Thus, BMW and DCSA have indicated their intentions to roll out HIV/Aids programmes among their suppliers. Moreover, large corporates operating in the Durban Automotive Cluster are putting into place procurement policies that require suppliers to conform to certain standards with regard to HIV/Aids management. The growing trend towards the establishment of Automotive Supplier Parks (clusters of component suppliers located around the main assemblers) based in the three provinces will facilitate the dissemination of such interventions, as well as monitoring the implementation and effectiveness of HIV/Aids interventions among component suppliers.

Impact on company costs

Among the key comparative advantages of the SA auto industry in recent years, derive from increased labour productivity and low direct labour costs, relative to its global competitors. Thus, the adverse impact of company costs related to HIV/Aids morbidity and mortality on payroll costs will be detrimental to global competitiveness. There is very little information on aggregate costs to the industry available in the public domain. Thus, this section provides an overview of the general nature of Aids related costs to the employers, and provides some examples of its impact on selected assemblers, and possible implications for small and medium-sized companies especially in the component manufacturing industry.

Aids-related costs to companies are mostly of a direct and indirect nature as outlined in Table 18.

Table 18: Total Aids-related costs to an Employer

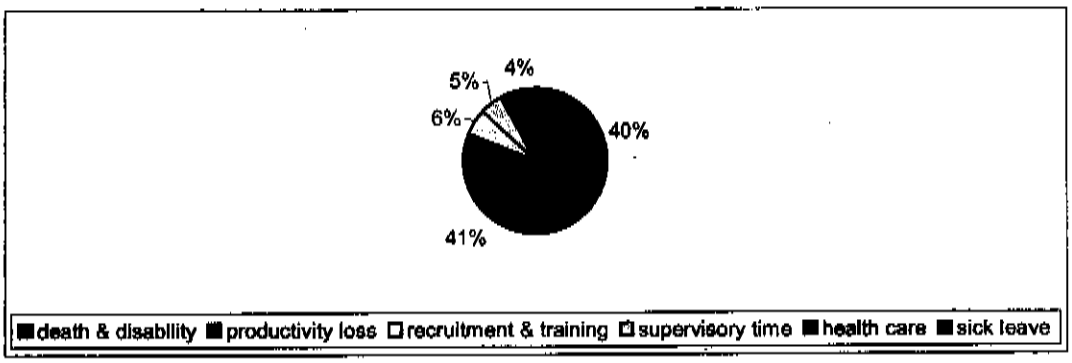
Individual costs from one employee with HIV/Aids	**Direct Costs**	**Indirect Costs**
	Medical care	Reduced on the job productivity
	Benefits payments	Reduced productivity due to absenteeism
	Recruitment and training of replacement workers	Loss of supervisors' time in dealing with productivity losses
		Vacancy rate until replacement is hired
		Reduced productivity while the replacement workers learns the job
Organisational costs from several employees with HIV/Aids	Insurance premiums	Senior management time
	Accidents due to ill workers and inexperienced replacement workers	Production disruption
	Costs of litigation over benefits and other issues	Depressed morale
		Loss of experienced workers
		Deterioration of labour relations

Source: Rosen et al 2003

Other direct costs related to HIV/Aids include prevention programmes such as peer counselling, education and awareness, as well as treatment and care, including the provision of antiretrovirals. As an example of how this may unfold in reality, Figure 13 shows that, in the case of Daimler Chrysler SA, more than 80 per cent of the costs of an infection are equally shared between death and disability (direct costs)[5] and productivity losses (World Economic Forum 2002a). Thus, increases in the proportion of direct costs in relation to overall payroll, may have an adverse effect on overall labour cost. Other studies have described how many companies have adopted cost-avoidance strategies (limiting benefits, passing on premium increases to individual workers etc) in order to reduce the impact on payroll cost (Rosen et al 2003).

[5] Also note that not all costs related to insured benefits accrue directly to the company. Only increases in premiums may apply, whereas benefit payouts (lumpsums etc) accrue to the insurance company.

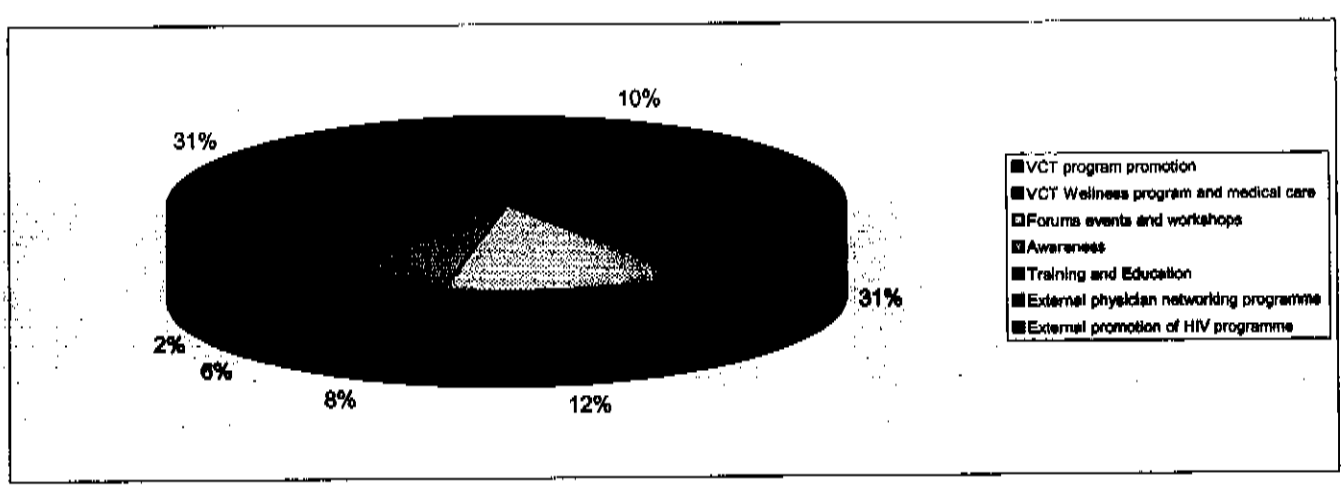
Figure 13: HIV/Aids related costs of an infection at DaimlerChrysler(2002)



Most of the assemblers have adopted extensive intervention programmes, including insured benefits, as well as the provision of HAART through their medical schemes. Overall , then it does not seem that Aids represent a major financial risk to most assemblers. A cost impact analysis at Daimler-Chrysler in 2002 estimates that the average present value cost per HIV infection is US$31,000.At its peak year (2006) of HIV related expenditure, forecasted costs will be at about 4 per cent of the 2001 payroll, or US$1.6million.

In 2002, Daimler Chrysler SA HIV/Aids budget was US$44 per employee per year (0.5% of payroll); that of BMW SA was US$54 per employee per year(World Economic forum 2002a,2002b). Figure 14 provides a breakdown of the Aids budget of BMW. An analysis of the types of interventions show that VCT and wellness programmes, aimed at nutritional support and support of the immune system accounts for the largest proportion of Aids costs. While this distribution tend to reflect general practice among larger companies, the provision of HAART(Highly Active Anti-retroviral treatment) is usually considered as a last option, due to the costs involved.

Figure 14: Distribution of Aids budget of BMW ($161 000 per annum)



Source: Global Health Initiative<www.weforum.org/globalhealth>

As indicated before, these interventions have the potential of slowing down the waves of cumulative losses of labour supply. This is particularly important given that productivity losses may present a much more difficult challenge to assemblers, as it represent one of the key components of the industry's competitiveness. Thus, given the growing skills intensity in the industry, investment in education and training may be at risk given losses at skilled and highly skilled levels. Again, the DCSA example shows that prevalence levels at these levels may not be as high as those at lower skilled levels, but are higher than expected, as shown in Table 19.

Table 19: HIV prevalence by job bands at Daimler Chrysler (2002)

	Total employees	HIV prevalence
Hourly	740	10%
Line management	416	7.2%
Senior management	80	3.8%

Source: Colvin et al 2002.

This represents an area of vulnerability especially given that, as expected, there are huge differences between the relative costs of an infection at different skill levels. Thus the average present value cost (discounted cash flow) of an infection for hourly employees were US$17,000 to US126,000 for those in the highest pay range and skills in 2002, at DCSA.

A related issue is that of increased automation as one of the cost-avoidance strategies adopted by companies in the face of Aids. The low levels of employment growth in the industry, may also be indicative of increased automation as a key element in increasing the global cost-competitiveness of exports. However, in the face of Aids-induced costs, automation may become a blunt tool in exacerbating the increased cost and social burden on the state, individuals and households as unemployment increases (Bruton 2003). At the same time, it may deepen societal losses in human capital, as Aids-induced losses of skills are not replenished. Thus, there may be a fundamental contradiction in providing extensive intervention programmes to reduce HIV risk at the workplace, along with the negative impact of automation and unemployment in surrounding communities.

As indicated previously, South African automotive firms are increasingly integrating into global supply chains. Thus, their relative exposure to HIV/Aids and their response thereto will become an important element in securing foreign and domestic investment. Large assemblers are more likely to test their workforce and determine their own risk exposure, compared to the component manufacturers. However, they lack an understanding of the distribution of risk in their supply chains. As such they run the risk of Aids -induced supply chain interruptions from suppliers and distributors. Anecdotal evidence suggests that large auto assemblers in a KwaZulu Natal industrial area increasingly have to factor in Aids-induced shocks to their supply chains (auto

component manufacturers). Thus, individual company costing of the potential HIV impact may be limited, insofar as it does not factor in ancillary costs, arising from HIV risk of suppliers and distributors. In this context, the allocation of resources may be inappropriately targeted, based on inadequate information.

Thus large, formal and mainly multinational companies have developed relatively comprehensive responses to HIV/Aids in terms of education and awareness, and given economies of scale, can afford to provide treatment and care to infected employees, and even to their families. However, the same cannot be said for small, medium and micro-sized companies. This imbalance may jeopardise meeting global competitiveness requirements (including Just-in-Time delivery and quality standards).

One of the more significant findings, as shown in BMW is that 30 per cent of the budget is aimed at promoting an external awareness of the Aids impact. Among other agents one may assume that these would include external component suppliers as well. As shown previously, there is very little available in terms of the cost impact on the component industry. Finally, this analysis provides some insight on the potential dynamics at play in assessing the relative level of risk in one sector.

IMPLICATIONS FOR THE DTI

The post-apartheid labour market now enters one of its most challenging periods in understanding the scope of, and mitigating the impact of HIV/AIDS on the economically active population. This happens in the midst of also dealing with rising unemployment levels, poor employment growth, rising wage and income inequality, and a skills deficit. The long-term developmental impact is even more severe, given the disproportionately negative impact on critical significant sub-groups in the labour market, including Africans, women and the youth. Thus, HIV/AIDS is likely to become a key factor in consolidating and exacerbating existing labour market inequalities.

However, it is also clear that some of the determinants of the negative HIV/AIDS impact on the labour market lies within companies, sector and management practices. Overall then, while the risk of HIV transmission is based on individual personal behaviour, ultimately the impact thereof, lies in the structural inequalities within the labour market and the broader economy.

Ultimately, our understanding of the impact of HIV/AIDS is constrained by the lack of comprehensive data. However, given current data and knowledge, the following implications have relevance for the **dti**:

- Impact on the nature of employment
    - Given the disproportionate impact on low skill employees, there may even deeper declines in the employment of the low and unskilled as companies shift towards more capital-intensive technologies;

- This will further deepen levels of unemployment and poverty among those of the margins of the labour market.

- Impact on the skills deficit in terms of
  - The shift towards an increased demand for skilled labour will result in multiple demands on the small pool of skilled labour;
  - However, replacement and development of skilled labour will be jeopardised given the concentration of HIV/AIDS among Africans, women and young people;
  - This may impact negatively on training provision by the SETAs and possible cost increases of training as increased risks of HIV/AIDS are attached to skills development;
  - Replacement rates are further affected by a decline in the quality of labour supply, given increased incomplete schooling rates, declining post-school enrolments and completion; and early entry of youth into the labour market for survivalist reasons (with little or no skill).

- Negative impact on the attainment of Employment Equity
  - Given the reduced demand for low and unskilled labour, there will be a concomitant decline in the demand for Africans and women, who constitute the largest proportion of such labour.
  - There may be even greater pressure on the small pool of skilled and highly skilled labour that are Black and female, complicating the ability of companies to reach their equity targets.

- Lack of knowledge on the impact on manufacturing, as a priority growth sector
  - In general the manufacturing sector is reporting a negative effect, which will impact on industrial policy objectives to generate growth, increased competitiveness and job creation in certain target sectors, such as the auto industry.
  - Very little is known about the supply chain effects in terms of input industries and the impact on market demand.

- The support and growth of SMEs
  - Given the relative lack of responsiveness in terms of the management of HIV/AIDS among especially small companies, policy support interventions may be further undermined by the impact of HIV/AIDS.

- Implications for Black Economic Empowerment and Sector Equity Charters

- Given the demographic profile of HIV/AIDS the attainment of targets may not be as broad-based as anticipated.

- Corporate governance and reporting
  - Company reporting requirements have gone beyond the generic business and financial elements, issues of sustainability, environmental responsibilities and equity. There are currently various considerations on reporting requirements vis a vis HIV/AIDS which must be considered.

- Impact on utilities in transport, energy and telecommunications and local governments
  - Very little is known about the HIV/AIDS impact on these utilities, especially in regard to their fundamental role in creating a supportive environment for trade and investment through infrastructure provision;
  - Research has shown that the transport industry is heavily infected and affected and has particular relevance in terms of the access of goods to markets, harbours and so forth; the provision of infrastructure (roads, schools, electricity etc).

- Negative perceptions in terms of trade and investment
  - Some of the insecurities regarding the size and direction of the HIV/AIDS epidemic may extend itself to perceptions of the trade and investment opportunities in SA.

- Development of HIV/AIDS data at industrial sector level
  - In order to gain a clearer understanding of the macro-economic effect of HIV/AIDS, support of the development of company and sector level data needs to be improved.
  - Private sector level data lags behind that in the public sector, especially insofar as it relates to the health and education sectors

- There is a need for a much more overt role by the **dti** to promote and support the development of short-term and long-term responses internally (departmental level) as well in the **dti** 's interaction with its stakeholder sectors and companies;

CONCLUSION

The developmental consequences of HIV/AIDS are increasingly becoming evident at all levels. The management of HIV/AIDS has become endogenous to all policy development and service delivery processes. It is within this context that it is imperative that strong relationships be developed between the private and public sectors, especially in strengthening and up scaling efforts to mitigate the impact of HIV/AIDS. This paper has identified areas of vulnerability, including reliable and comprehensive data, as well as vulnerable sectors and sub-population groups in society and the broader economy.

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