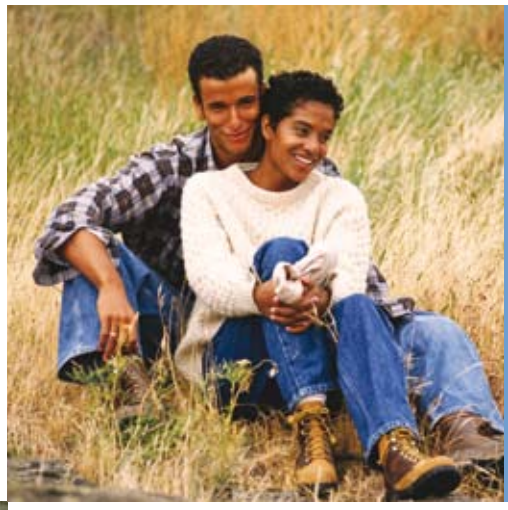
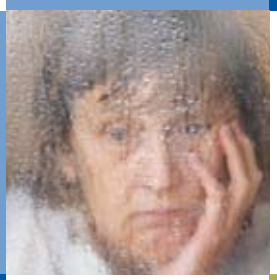
LIVE THE FUTURE

HIV and AIDS Scenarios for South Africa: 2005-2025

AN OVERVIEW OF FACTORS UNDERLYING FUTURE TRENDS





METROPOLITAN

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Tables and Graphs

This document forms part of the *Live the Future – Information Pack.*

Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
ART	Antiretroviral Therapy
ARV	Antiretroviral (drugs)
CBO	Community-based organisation
CDC	Centers for Disease Control and Prevention
CSW	Commercial Sex Worker
EC	Eastern Cape
FAO	Food and Agriculture Organisation
FBO	Faith-based organisation
FS	Free State
GAU	Gauteng
HBC	Home-based care
HIV	Human Immunodeficiency Virus
IDU	Intravenous Drug User
KZN	KwaZulu-Natal
LP	Limpopo
MDRTB	Multiple Drug Resistant TB/Tuberculosis
MSM	Men who have sex with men
NGO	Non-governmental organisation
NC	Northern Cape
NP	Northern Province
NWP	North West Province
OVC	Orphans and vulnerable children
PEP	Post-exposure prophylaxis
PLHA	People living with HIV and AIDS
PMTCT	Prevention of mother-to-child HIV transmission
SANAC	South African National AIDS Council
STI	Sexually transmitted infection
TAC	Treatment Action Campaign
TB	Tuberculosis
UNAIDS	United Nations Programme for HIV and AIDS
VCT	Voluntary counselling and testing
WC	Western Cape
WHO	World Health Organisation

Introduction

Metropolitan Holdings is interested in mobilising leadership from a range of sectors with a view to intensifying the HIV and AIDS response in South Africa. Part of this activity has been the development of scenarios that provide insight into the pathways the epidemic might take in the future.

Although many aspects of the epidemiology of HIV and AIDS in South Africa are well understood, there is no short answer as to why such high HIV prevalence levels have been reached in the country – particularly given that HIV emerged later than in western and central African countries which presently have much lower HIV prevalence levels. There is no shortage of biomedical and social science research that informs our understanding of the causal factors and social and economic consequences of the disease, but there has been very little emphasis placed on drawing together findings. This report explores the underlying aspects of the epidemic and reflects on possibilities for the future.

Defining the Scale of the Epidemic

Epidemiology involves understanding the origination and spread of disease. Epidemiological findings provide a foundation for understanding the distribution of infection, illness and death, as well as assisting in identifying risk factors and informing policies, strategies and interventions.

HIV prevalence

HIV prevalence refers to the estimate of the proportion of a defined population (e.g. pregnant women, youth, adults, employees) who are infected with HIV at a given time. This data may be used to model estimates of HIV prevalence in other population groups. Such estimates are crucial to developing plans to mitigate HIV infection and address effects of the epidemic.

National-level HIV-prevalence estimates in South Africa have, since the early 1990s, been drawn mainly from surveys among pregnant women attending public sector antenatal clinics. This data has been used to estimate HIV prevalence in the general population, and to inform trends of infection over time.

More recently, HIV prevalence has been measured through national population-based surveys. The surveys include not only HIV data, but also a range of demographic data, information on knowledge, attitudes, sexual behaviour and other HIV and AIDS-related practices. Population-based surveys have allowed for an expanded understanding of HIV prevalence – particularly the differences in infection levels amongst males and females, as well as differences related to geographic location, geotype of residence and behavioral factors.

Antenatal data provide an important source of information on HIV prevalence trends on a year-to-year basis. The main strengths of South African antenatal data include:

- a well-sampled and well-distributed number of surveillance sites;
- routine gathering of data from a large sample (around 18 000);
- (theoretically) no selection bias because informed consent is not required and consecutive clinic attendees are therefore selected.

Limitations include: a lack of detailed demographic data of respondents (only age, and site/province); sampling of public sector clinics only (which results in a predominance of poorer, black females); infertile women, non-sexually active women, non-pregnant women (including women who consistently use contraceptives and/or condoms), and some HIV positive women[1], amongst others, are either not sampled or are under-sampled; only women in the 15-49 age range are sampled; only limited analysis is done by the Department of Health.[2]

Advantages of population-based surveys include:

- males and females are sampled;
- overall sample includes representation of a wide range of demographic categories – age, race, residence geotype, employment status, marital status, migration;
- information is also gathered on knowledge, attitudes, sexual behaviours and other behavioural and social practices.

Limitations include: under-sampling of particular demographic groups (eg. Whites, Indians); under-sampling as a product of sampled respondents being able to opt out of providing a blood test and/or questionnaire;[3] large sample sizes are costly to obtain; and quality control has to be maintained over the collection and testing of blood/saliva samples. Population-based surveys are also logistically complex and are therefore only viably repeated every three to five years, which limits their value for showing short-term trends.

Figure 1: HIV prevalence in various types of study[4]

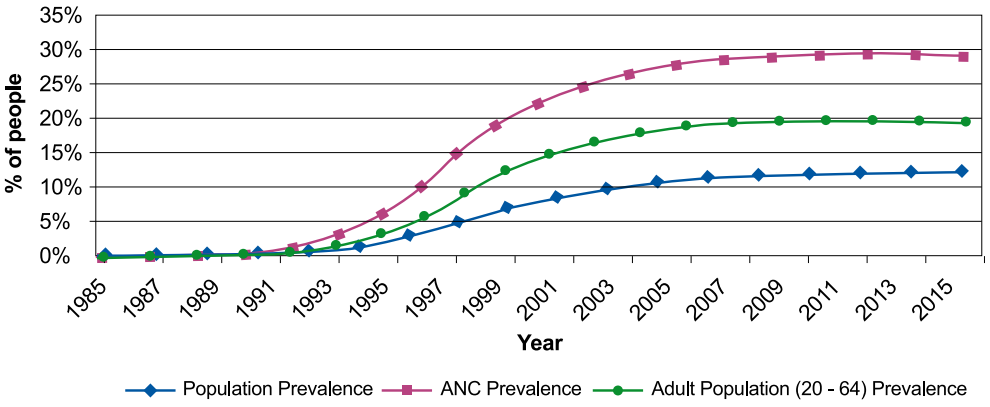


Figure 1 illustrates the differences between types of study and age ranges – ie. total population, women attending antenatal clinics, and adults aged 20-64.

Other data is also useful for developing an overall understanding of HIV prevalence including findings from targeted HIV surveillance studies conducted in communities; studies of groups such as youth, commercial sex workers (CSWs) or men who have sex with men (MSM); studies of various sectors such as health, education, prisons and workplaces; and occupational studies (eg. truck driving, military or police work). Findings from such studies are often not publicly available, particularly workplace data (including in companies and the military), but three recent publicly available sectoral studies have provided insights into HIV prevalence in relation to health workers, children and adults attending hospitals and clinics, and educators.[5]

Understanding HIV prevalence in South Africa requires the triangulation of data. This involves drawing on data from antenatal, population-based and other surveys as well as qualitative data. Reference can also be made to models and estimates derived from these – for example, the various ASSA models.[6] All available data needs to be taken into account to inform overall country-level prevalence, prevalence trends and patterns, and modeling of future trends.

HIV prevalence in South Africa

In South Africa, antenatal data has been available since 1989, and a revised detailed protocol with a randomised approach to clinic sampling was introduced in 1997. This data provides a useful overview of HIV-infection trends in pregnant women over the past 15 years. Three recent national-level population-based surveys – the Nelson Mandela/HSRC studies (2002/2005, which comprised a sample of all South Africans over two years of age), and a study by the Reproductive Health Research Unit (2004, which comprised young people aged 15-24) – include HIV status, demographic, social and behavioural data.

The Actuarial Society of South Africa has developed the ASSA AIDS and Demographic models that are widely used to estimate current and future HIV and AIDS related statistics. Figure 2 shows total numbers of HIV positive South Africans over time.

It is evident that the epidemic has entered a mature phase and that the level of new infections per annum is to some extent 'cancelled-out' by the level of deaths, leading to a leveling off of total numbers infected.

Figure 2: HIV prevalence in South Africa over time[7]

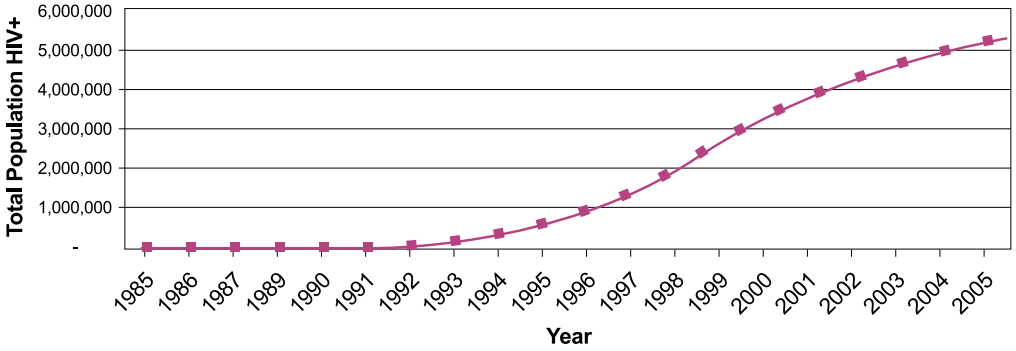
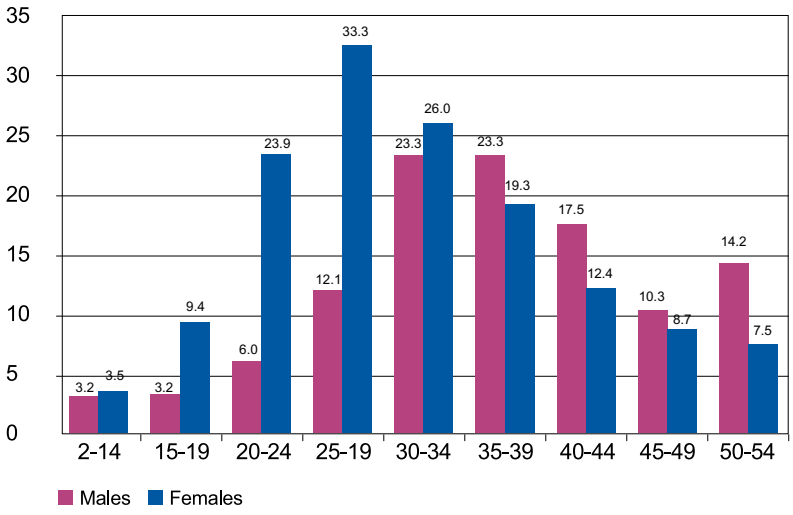


Figure 3 is drawn from the 2005 Nelson Mandela/HSRC population-based HIV prevalence survey. It shows that HIV prevalence is highest in the 20-49 year age groups, with the peak rate for females (in 2005) being 33.3% in the 25-29 year age group and for males, 23.3% in the 30-34 and 35-39 year age groups.[8] HIV is found in all age groups including at levels of over 3% amongst children 2-14 and amongst males and females 50 years and older.

Figure 3: HIV prevalence by age group and gender in 2005[9]



Key prevalence numbers are illustrated in the table below. The greatest variation in HIV prevalence is found by race, which is related to a range of socio-cultural and socio-economic factors. Estimates from the Mandela/HSRC survey (2005) for persons aged two years and older were Blacks, 13.3%; Whites, 0.6%; Coloureds, 1.9%; Indians 1.6%.[10] The reasons underlying these differences require further research.

Table 1: Key prevalence data, 2005[11]

Total living with HIV	5,203,773
Total living with HIV, 15-59	4,889,892
Adult men living with HIV, 25-59	1,929,011
Adult women living with HIV, 25-59	1,966,188
Male youth living with HIV, 15-24	179,693
Female youth living with HIV, 15-24	815,000
Children living with HIV, 0-14	275,841
Total HIV prevalence (all ages)	11.0%
Antenatal prevalence of pregnant women (15-49)	27.9%
HIV prevalence amongst women, 20-64	19.9%
HIV prevalence amongst men, 20-64	17.7%

HIV prevalence in various sectors

Three sectoral studies have been conducted by the HSRC.[12] These provide information on HIV prevalence amongst educators, amongst children aged 2-9, and amongst mothers attending public health services in the Free State. These prevalence rates are not dramatically different from what is found in population-level studies. In the health facility study, hospital patients were found to be more likely to be HIV positive than the general population. This is a product of the greater likelihood that they would need hospitalisation for HIV-related illness.

Table 2: Sectoral HIV prevalence and other data[13]

Sector	Percent
HIV prevalence of public health facility patients in FS, KZN, MP, NWP	28.0%
HIV prevalence of health workers in public facilities in FS, KZN, MP, NWP	15.7%
HIV prevalence of educators aged <25 years in public sector schools	6.5%
HIV prevalence of educators aged 25-34 years in public sector schools	21.4%
HIV prevalence of educators aged 35-44 years in public sector schools	12.8%
HIV prevalence of educators aged 45-54 years in public sector schools	5.8%
HIV prevalence of children aged 2-9 attending public health services in FS (hospitalized)	21.5%
HIV prevalence of children aged 2-9 attending public health services in FS (out-patients)	13.7%
HIV prevalence of mothers of children aged 2-9 attending public health services in FS	29.1%

HIV incidence

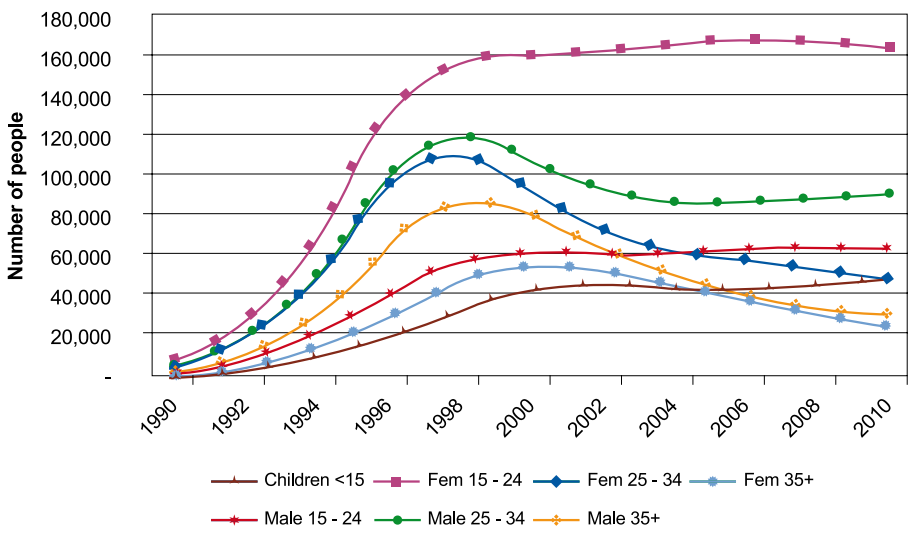
HIV incidence refers to the estimate of the number of new HIV infections that occur over a given time period – eg. number of new infections per year. Incidence measures are better than prevalence measures for understanding the dynamics of HIV transmission. This is because prevalence figures represent the total number of people living with HIV who may have been infected with HIV over the past decade or more. Tests have only recently become available for determining how recently HIV infection has occurred. Incidence can also be represented as the percentage of a given population who are newly infected with HIV in a given year.

The 2005 Nelson Mandela/HSRC household survey measured HIV incidence in South Africa using a blood testing assay that allowed for recent infections to be identified (ie. in the past 180 days). Out of the sample of nearly 16 000 respondents, 181 cases were identified as recent infections, and it was possible to estimate the new infections per year for a given population group. The following percentages thus reflect the proportion of a given group that were estimated to have been infected with HIV in a 12 month period. Among study respondents overall (ie. the SA population two years and older), the incidence rate was 2.7%. Incidence among Blacks was estimated at 3.4% and for other race groups, under 0.5%. Individuals living in urban informal areas had the highest measured incidence rate (7.0%), compared to those living in rural informal areas (2.8%), rural formal areas (2.7%), and urban formal areas (1.8%). Incidence rates for females aged 15-24 were high – 6.5% in comparison to 0.8% for males in the same age group. Rates for adults 25-34 were also high – 7.1%.[14]

HIV incidence can also be estimated using modeling techniques. In South Africa, the estimated peak of HIV incidence was in 1997.[15] This means that the number of new infections has declined since 1997, although HIV prevalence has increased. Prevalence measures show the total number of people living with HIV at any given time. Prevalence may show declines as a product of declining new infections in a given age group (eg. 15-19 year old youth), as well as people dying from AIDS (and/or people with AIDS dying from other causes). Prevalence may also increase as a product of antiretroviral (ARV) programmes, which prolong life.

Figure 4 shows the modelled trajectory of HIV incidence by sex and age group, with rapid increases in the early phases of the epidemic – predominantly affecting those at highest risk – and then leveling off and declining slowly. In the early phase of the epidemic, prevalence is low, so incidence is determined by very high-risk behaviours (for example, non condom use and high partner turnover/concurrency), whereas in the later phase, prevalence is high, so there is a higher risk of exposure for every sex act (for example, even lower risk activities such as irregular condom use and infrequent partner turnover carry a higher risk than they would have in the early phase epidemic because the infection pool is larger).

Figure 4: Projected number of new infections by sex and age group, ASSA2003[17]

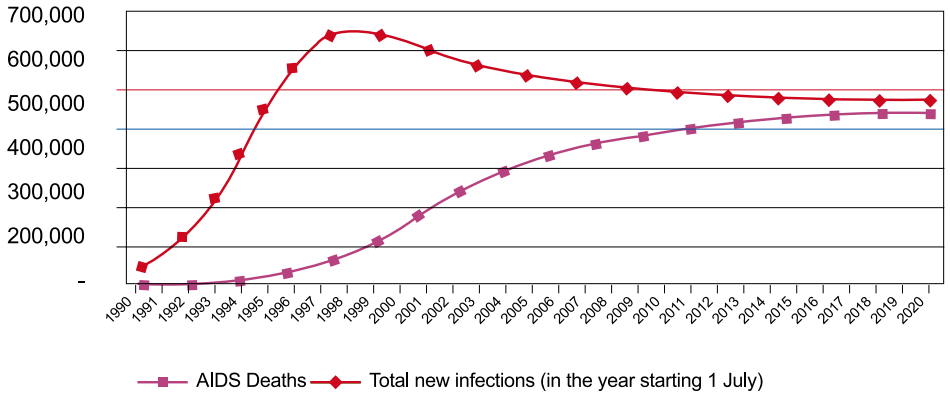


HIV prevalence of young people aged 15-20 is often used as a proxy measure for HIV incidence, given that it is probable that most infections in this age group are recent infections. Antenatal HIV prevalence for females under 20 has not changed markedly over the past five years – it was 16.1% in 2000, and again 16.1% in 2004, with minor fluctuations in the intervening years.[16] This suggests risk factors for youth have remained similar over time, and that prevention campaigns targeting youth have not been impactful.

AIDS deaths

Rates of AIDS death generally follow the same incidence pattern as that of HIV infection, but on average occur seven or more years later as a result of the long latency period of HIV. The death rate may be affected by a number of factors, including the relative control of related diseases such as tuberculosis (TB), as well as the effective implementation of antiretroviral (ARV) programmes. Figure 5 illustrates the projections using ASSA 2003 with deaths in 2005 being projected at 336,901, increasing to 439,391 by 2020.

Figure 5: HIV infection versus AIDS death, ASSA2003[18]



Cumulative AIDS deaths by mid-2004 have been estimated at around 1,2-million with life expectancy at 51 years. The introduction of an ARV programme supporting half of those in need of treatment by 2010 would ensure that average life expectancy is maintained at around 50 years.[19] Figure 6 illustrates actual ARV rollout in relation to people who are AIDS sick.

Figure 6: Actual ARV rollout relative to AIDS sick[20]

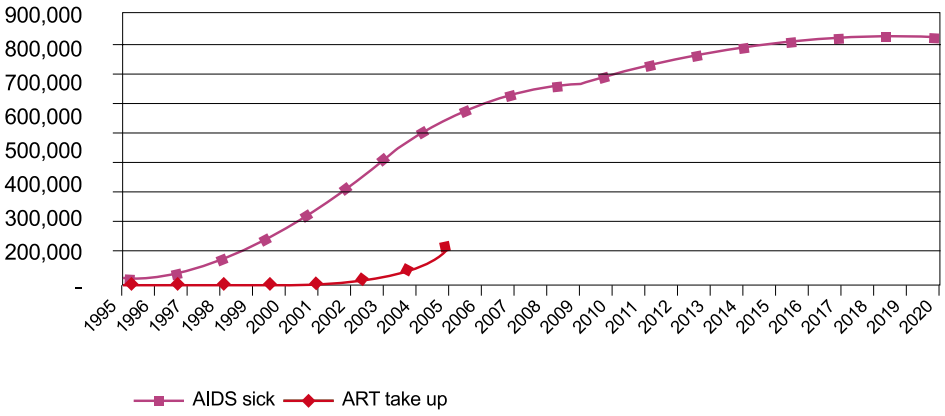


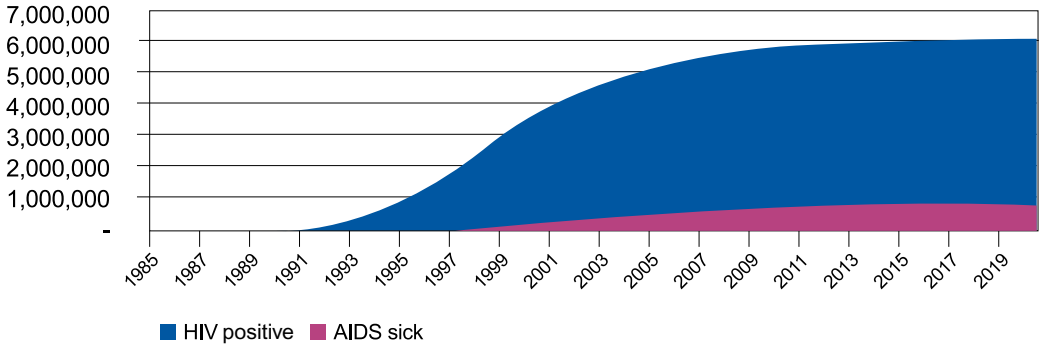
Table 3 illustrates estimates of key AIDS mortality data, and shows that over half a million people were AIDS sick in 2005. Total AIDS deaths were in excess of 300,000, and cumulative deaths nearly 1.5 million. Life expectancy was around 50 years for both sexes.

Table 3: Key mortality data[21]

Total AIDS sick in mid-2005	554,629
Total AIDS deaths in mid-2005	336,901
Cumulative AIDS deaths by 2005	1,477,556
Male life expectancy in years in 2005	49.1
Female life expectancy in years in 2005	52.1
Total AIDS orphans (maternal, <18) in 2004	626,000
Total orphans (maternal, <18) in 2004	1,126,000

Figure 7 illustrates the relationship between the total number of HIV infections over time in comparison to numbers of AIDS sick. It is clear that the total numbers of HIV positive people in South Africa are expected to level off at around 6 million under the current national interventions. Higher levels of treatment will result in an increase in the total HIV prevalence (fewer AIDS deaths). The estimated proportion of people who are AIDS sick in the mature epidemic is expected to remain between 10% and 14% of the total.

Figure 7: Total HIV infections in comparison to AIDS sick[22]



Biological Aspects of HIV Infection and Prevention

In sub-Saharan Africa, HIV is transmitted mainly through sexual intercourse, although other modes of transmission are also relevant to prevention. Factors affecting HIV infection through sex include variations in male and female physiology as well as sexual behaviours and practices. Additionally, HIV can be acquired through exposure to blood, and by babies perinatally or through breastfeeding.

Biomedical technologies have been positioned at the forefront of HIV prevention interventions globally. These are largely based on reducing biological risk factors. The technologies and interventions for preventing all modes of HIV infection are outlined in Table 4.

Most technologies and interventions, with the exception of addressing injecting drug use, are provided in South Africa at national level, although not all are provided at optimal levels of efficiency. [Asterisk indicates limited levels of intervention in South Africa.]

Table 4. Modes of HIV infection and biomedical technologies for prevention

Mode	Technology	Intervention
• Exposure to blood via blood transfusion	• Scientific screening procedures	• Screening/selection of blood donors for risk factors • Screening of blood supplies
• Exposure to blood in healthcare settings (healthcare workers, patients)	• Needle disposal systems • Gloves • Infection control practices	• Implementation of guidelines for universal precautions • Provision of Post Exposure Prophylaxis (PEP)
• Exposure to blood in non-healthcare settings	• Gloves • Infection control practices*	• Implementation of guidelines for universal precautions • Provision of Post Exposure Prophylaxis (PEP)
• Injecting drug use (IDU) – needle sharing	• Detoxification* • Harm reduction*	• Detoxification programmes • Needle exchange programmes
• Mother to child HIV transmission	• Antiretroviral drugs and other regimens* • Caesarian delivery* • Controlled infant feeding (exclusive replacement feeding or exclusive breast-feeding)*	• Implementation of Prevention of Mother to Child Transmission (PMTCT) programmes
• Sexual intercourse	• Sexually Transmitted Infection (STI) treatment • Male condoms • Female condoms* • HIV testing	• Syndromic management of STIs • Implementation of condom programmes • Implementation of Voluntary Counselling and Testing (VCT) programmes
• Sexual intercourse (rape, coercive sex, unintentional/ accidental exposure)	• Antiretroviral drugs for post-exposure prophylaxis • STI treatment • Emergency contraception	• PEP programmes • STI treatment regimen available

Exposure to HIV via blood transfusion

Every year in South Africa approximately 900 000 units of blood are obtained from donors and tested for HIV.[23] Although donor recruitment criteria and the development of highly sensitive and specific testing for HIV antibodies in blood and blood products limit the risk of HIV in the blood supply, there remains a small risk that HIV-contaminated blood will escape detection and be used in transfusions. This risk is minimal (estimated at around 1:400 000) and risk elimination procedures are comparable to best practices in developed countries.[24]

Exposure to HIV in healthcare settings

HIV can be transmitted in healthcare settings between patients and healthcare workers as a result of needle stick and other sharp instrument injuries, as well as between patients as a result of poor sterilisation and infection control practices. A study of medical interns at Chris Hani Baragwanath Hospital near Johannesburg found that 69% had experienced sharp instrument injuries, 56% had experienced penetrating injuries during pre-clinical training, and 18% recollected needle stick injuries involving HIV-positive patients.[25] In a survey in the Free State,[26] it was found that 19% of health workers had experienced a sharp instrument injury in the past three months. In the same study it was found that a wide range of infection control practices were not being adequately applied, including in relation to dentistry and handling of breast milk.

In the HSRC study of HIV in the health sector in four provinces,[27] the HIV prevalence among public sector healthcare workers was 16%. This is lower than the Dorrington/Bradshaw estimate of 23.4% among 18 to 64 year olds but very similar to the Nelson Mandela/HSRC estimate of 15.6% among 15 to 49 year old adults. A study in Zaire found that healthcare workers had a similar HIV seroprevalence to the general community and concluded that there were therefore not likely to be exceptional risks to health workers. Several other studies in Africa conducted on indigenous healthcare workers and on expatriate medical workers point to similar conclusions, i.e. that the overwhelming majority of HIV infections among health workers are due to sexual exposure.

Injecting Drug Use (IDU)

The global drug market is expanding and South Africa is increasingly serving as a conduit country for the drug trade, as well as a market for harder drugs, including highly addictive drugs such as heroin. Heroin may be vapourised and inhaled, snorted, smoked or injected, and the latter practice is often associated with needle sharing. The risk of HIV transmission through needle sharing is many times higher than through sexual intercourse. Intravenous heroin use in South Africa is presently very low, but has the potential to escalate. There are heroin detoxification programmes available in the country, but no formal needle exchange programmes exist.[28]

Mother-to-child transmission of HIV

HIV may be transmitted from a mother to her baby during pregnancy, during childbirth and through breastfeeding. It is estimated that 50% of HIV-positive babies in Africa die before their third birthday.[29] The risk of mother-to-child transmission varies depending on a variety of factors. These include obstetric practices, viral load, CD4 counts, prevalence of STIs or other infections, and other factors such as frequency of sex and multiple sexual partners during pregnancy. Perinatal incidence of HIV in 2005 was estimated to be 33,832 cases, of which 23,238 were through breastfeeding.[30]

In developed countries, rates of mother to child transmission of HIV has been reduced to less than 1% through the effective implementation of PMTCT (prevention of mother-to-child transmission) interventions. MTCT rates are likely to decrease over time as a result of improved PMTCT programme roll-out, improved regimens, and clearer guidelines in relation to breast feeding. The expansion of the national ARV programme may contribute to lowering of risk to babies as ARVs used to prevent transmission will be increasingly available at a greater proportion of health facilities.

Sexually Transmitted Infections (STI)

Sexually transmitted infections increase the risk of acquiring and transmitting HIV infection during intercourse as a result of inflammation and ulceration. Treating STIs has been shown to reduce HIV incidence. The prevalence of STIs in South Africa is estimated to range from 5% to over 30% in various population sub-groups and localities depending on the type of STI.

South Africa has a well-established syndromic management system for dealing with STIs, and rates of certain STIs have declined markedly as a result – for example, syphilis declined from 11.2% in 1997 to 1.6% in 2004 among antenatal clinic attendees.[31] Other STIs, including herpes, however, do not appear to be declining, and effective management of STIs remains a vital part of HIV prevention.

Condoms

Male latex and female polyurethane condoms provide an impermeable barrier to HIV. A review of condom use amongst HIV sero-discordant couples, which included situations where condoms were not always used correctly, concluded that male condoms reduced HIV incidence by 80%.[32] Efficacy of female condoms is lower. A study in Uganda found that consistent male condom use in the general population was associated with low HIV incidence, but that inconsistent use was not protective against HIV infection.[33]

Reported condom use at last sex has increased markedly in South Africa over the past decade. In 1998, 8% of females in South Africa aged 15-49 reported using a condom at last sex, compared to 2005 where the level among females aged 15 and older was 32.8%.[34]

South Africa has a well-established male condom procurement, quality control and distribution system. In 2004, some 346 million condoms were distributed – an average of nearly 29 million per month. A further 18 million condoms are estimated to be sold annually. Female condoms are distributed selectively in very low numbers at pilot sites.

Male condoms are recognised as being readily accessible in South Africa – in 2002, more than 94% of males and 90% females between 15 and 49 agreed that condoms were easy to access when needed.[35] In 2004, an average of 22 public sector condoms were distributed per male aged 15-59, which is one of the highest rates of condom coverage globally. This ratio will increase to over 30 with increased levels of public sector condom procurement.[36]

Youth aged 15-24 have high rates of condom use – 72.8% of males and 55.7% of females in 2005 reported condom use at last sex.[37] 'Always condom use' for young people aged 15-24 was 33% in 2004.[38] Persons with multiple partners are also more likely to use condoms at last sex – 33.4% of males with one sexual partner reported condom use in comparison to 62.3% of males with multiple partners in 2005.[39] High levels of condom use, consistent or not, contribute to reduced incidence of HIV. It is however a concern that although reported condom use at last sex is high in South Africa, there does not appear to have been a significant impact on HIV prevalence. This suggests that further research is needed to assess correct and consistent use, but also that consistent and correct use should be actively promoted.

Voluntary Counselling and Testing (VCT)

VCT is an important element of HIV prevention, treatment, care and support programmes. However, it is a complex intervention that does not uniformly lead to adoption of HIV prevention behaviours amongst people testing negative, nor does it necessarily or uniformly direct HIV-positive persons towards prevention practices, or seeking out of treatment, care and support interventions.[40]

Knowledge of HIV status may contribute to depression and other negative psychological conditions (including, in some instances, suicide). Additionally, a subset of persons testing positive may be subject to physical violence and emotional duress when disclosing to their sexual partners. It is important, therefore, that VCT services incorporate psychological support services (or provide referral to such services).

VCT is widely available in South Africa through public sector clinics, hospitals, and through private health services, private doctors and in some of the larger workplaces. The introduction of rapid HIV tests has improved uptake. Protocols and policies are well-established, but the quality of services may vary.[41] Persons testing HIV positive require long-term counselling and support, and such services are

not uniformly available. Efficient counselling services are also interdependent with adequate venues and support to counsellors who are vulnerable to burnout.

UNAIDS/WHO have recently advocated routine HIV testing in healthcare settings for STI patients, pregnant women, and for persons presenting with symptoms that could be HIV-related.[42]

Post Exposure Prophylaxis (PEP)

Post-exposure Prophylaxis (PEP) for HIV reduces the risk of HIV infection following potential exposure through any mode of infection. It involves the provision of antiretroviral drugs within a period of up to 72 hours after the risk event. Risk of HIV seroconversion may be reduced by as much as 81%.[43]

PEP is available in the public and private healthcare system in South Africa, although not uniformly. Although PEP could, in theory, be offered to any person who believes they have been exposed to risk (for example, as a result of a condom breakage), it is rarely promoted for use in such instances. Risk of HIV infection from a single sex act is low, particularly if STIs are absent.

PEP is provided in the public and private healthcare system as an option for rape survivors. Rape statistics for South Africa are imprecise, as it is believed that a large proportion of rapes go unreported, but reported cases exceed 50 000 per annum. Both females and males are vulnerable to rape (for example, men in prisons). Issues of concern in relation to HIV prevention include the limited promotion of PEP, the limited numbers of trained front-line healthcare workers, police and other services providers trained in PEP protocols, and insufficient integration of key services that would increase PEP uptake rates.

Other biomedical approaches

Three other biomedically oriented HIV prevention approaches have been emphasised over the past decade. These are vaccines, microbicides and male circumcision.

- Vaccines are designed to stimulate the body's immune system to produce an immune response that destroys an invading pathogen. The concept of an HIV vaccine has been on the research agenda since the early stages of the epidemic, with efforts intensifying in the latter half of the 1990s. In 1997 strong assertions were made that a 'vaccine will be available within the next decade,'[44] but more recently this optimism has been replaced with an undertaking to 'stop promising when' as a product of slow progress to date. Although vaccine research is ongoing, and products and field trials continue to expand, it appears that a viable, implementable vaccine is still a long way off.[45]

- The term microbicide refers to agents that can kill or immobilise harmful pathogens. A range of microbicides are under development for HIV prevention – mainly for intravaginal use, but also potentially for rectal use. The expected effectiveness of microbicides under 'perfect use' conditions is low – 40-70% for the first generation of products. At this limited efficacy, microbicides need to be used in conjunction with condoms. Although microbicides may offer greater female control over HIV prevention, research to date suggests that potential for covert use is likely to be limited.[46] Highly effective microbicides are unlikely to be available in the short to medium term.

- A recent study conducted in South Africa[47] has shown that male circumcision is protective for HIV prevention. This relationship is being explored in other studies. Although promising, male circumcision alone is insufficient to prevent infection with a high degree of efficacy, and condom use remains recommended for both circumcised and uncircumcised men. There is also concern that promotion of circumcision may impact on condom use and other prevention strategies. Thus, the potentials of circumcision as an intervention strategy needs to be viewed cautiously.[48]

Trends of interventions based on biomedical technologies

In South Africa, biomedical interventions such as blood supply safety, syndromic management of STIs, and condom distribution are all likely to be contributing to HIV incidence reduction. However significant impacts on HIV prevalence are still not being seen.

PMTCT and PEP for HIV prevention require continued emphasis and expansion if they are to significantly influence HIV incidence. Emerging technologies, such as vaccines and microbicides, and medical interventions such as male circumcision are unlikely to contribute markedly to HIV incidence reduction in the foreseeable future. A growth in needle sharing in conjunction with injecting drug use is a potential emerging risk factor.

Socio-behavioural Aspects and Underlying Determinants

Risks relating to HIV infection occur at both the biological level and behavioural levels. These, in turn, are influenced by contextual factors at micro- and macro level. Table 5 is an adaptation of a similar table produced by Barnett and Whiteside (2002), and explores these various determinants.

Table 5: Determinants of HIV infection risk[49]

	Macro-environment	Micro-environment	Behavioural factors	Biological factors
Determinants	• Governance • Religion • Culture • Income distribution	• Poverty • Mobility • Urbanisation • Access to HIV prevention services • Sexual violence	• Unprotected vaginal/anal sex • Early age of sexual debut • High age differentials between youth and sexual partners • Ignorance of HIV status • Rate of partner change • Concurrent partnerships • Sexual assault • Transactional sex/sex work • Breastfeeding (in case of baby) • Injecting drug needle-sharing • Occupational exposure to HIV	• Age • Gender • Viral load • Presence of other STIs • Mother HIV positive (in case of baby)
Intervention response	• Political leadership • Religious leadership & support for FBO response • Cultural leadership • Economic leadership & policies	• Poverty relief • Rural and urban development • Family housing for employees • Efficiency of HIV prevention services • Efficiency of legal and justice system	• Condom use • STI treatment • Delay of sexual debut • Avoidance of older sexual partners amongst youth • VCT • Reduction in partner turnover • Reduction in concurrent partnerships • PEP for sexual assault • Reduction in transactional sex • Condom promotion for sex work • Infant feeding schemes • Needle exchange programmes; detoxification • PEP for occupational exposure	• Blood safety • ARV treatment • STI treatment • ARV therapy during pregnancy • Infant feeding

Behavioural determinants linked to sexual behaviour

Age of sexual debut is one of the major factors which influences HIV risk. Early sexual debut is linked to having a greater lifetime number of sexual partners. The earlier the sexual debut, the greater the risk of HIV infection.

Age mixing and sexual networking are important determinants of HIV infection and HIV risk has been shown to be higher among young people with sexual partners who are five or more years older than themselves. In the 2005 Nelson Mandela/HSRC survey males aged 15-19 who had female partners five or more years older than themselves had an HIV prevalence of 19.0% in comparison to 3.0% for males who had partners within five years of their age. For females aged 15-19, the rates were 29.5% for those with partners more than five years older than themselves, and 17.2% for those with partners within a five year range.[50]

HIV risk is also increased by having unprotected sex with greater numbers of sexual partners. Amongst youth aged 15-24, 27.2% of males had more than one partner in the past year in comparison to 6.0% of females. For males aged 25-49, the rates of having more than one partner were 14.4% and for females it was 1.8%.[51] Having more than one partner in the past year was more likely for people living in urban informal and rural areas, and rates were higher than average amongst Black males and Coloured females.

Acute HIV infection and risk of transmission

Recent studies have provided empirical evidence to support the theory that the risk of transmission of HIV from males to females is substantially increased during acute infection. This is because semen viral load levels increase and decrease in approximate parallel with changes occurring in blood. Modeling suggests that these acute dynamics increase probability of heterosexual transmission by 8-10-fold between a peak which occurs from 20 to 54 days after infection.[52]

Men in sub-Saharan Africa with average semen HIV-1 loads would be conservatively expected to infect 7%-24% of female sex partners during the first 2 months of infection. The predicted infection rate could be over 50% when either partner has an STI. It is therefore likely that sexual transmission of HIV by acutely infected individuals has a disproportionate effect on the spread of HIV infection. This observation has particular resonance in South Africa where the phenomenon of work-related migration and cultural acceptance of men having more than one partner, creates the conditions conducive to individuals having concurrent (i.e. two or more at the same time) partners. If a man becomes infected with HIV by one partner and he has one or more concurrent partners, the risk of transmission to the other partners is very high.

Whilst acute HIV infection compounded by the practice of having concurrent partners probably plays an important role in explaining the current pandemic in Africa, the mounting of an appropriate response is challenging. This is because very few cases of acute transmission are ever identified in this early phase of infection. Behaviour change programmes aimed at limiting the number of partners and increasing the correct and consistent use of condoms therefore remain important interventions.

Demographic and contextual factors

Race

According to numerous population-based HIV prevalence surveys, race is one of the strongest predictors of HIV status in South Africa. Although HIV is present among all race groups in South Africa, it is much more common among Blacks than among other groups. Marginalisation and discrimination on the basis of race or ethnicity must be understood as a factor that shapes vulnerability to HIV infection in South Africa. In the post-apartheid era, racially-based disadvantage continues to occur in relation to exposure to poverty, place of residence, education, job opportunities, skills and training and access to services. In contexts with constrained opportunities and resources, risky behaviours are more likely.

Gender

Women are particularly disempowered and disadvantaged, making them more vulnerable to HIV infection than men. According to Abdool Karim, 'In the evolution of the HIV epidemic in South Africa an overarching factor has been the intersection of gender with race in the historical legacy of apartheid.'[53]

HIV prevalence rates in South Africa demonstrate gender disparities at all age levels: between the ages of 15-34, females have higher prevalence rates, while amongst adults 35 and older, male prevalence rates are higher, but do not reach the same levels as females overall. Among young people, females are significantly more vulnerable to HIV than males. For example, 24% of women aged 20-24 and 33% of women aged 25-29 are HIV-positive, compared to 6% and 12% among men in the same age groups.[54]

There are numerous factors which can increase women's vulnerability to HIV infection. Some of these are linked to physiological factors, while others are related to gender roles, including social, cultural and economic factors.[55]

Gender norms differ within and between societies; however, there are some relatively widespread gender norms that guide male and female behaviour, and that shape vulnerability to HIV infection. Factors that increase women's vulnerability to HIV infection include: power imbalances between men and women which undermine women's ability to negotiate safe sex; rape or coercive sex; alternative, risky sexual practices such as anal sex in order to maintain virginity; motherhood as a 'female ideal' (which may put women at increased risk for HIV infection if they feel pressure to bear children); women's economic dependence on men; sex as a means of exchange for material goods; and fear of physical violence.

Sociocultural factors and gender norms also affect male behaviour in ways that may increase female vulnerability to HIV. These include: the expectation that men should be knowledgeable and experienced in sexual matters (therefore making them hesitant to seek out information about HIV and AIDS); ideals of masculine dominance over females; concepts of male self-reliance and 'invulnerability'; and the expectation of being the primary breadwinner which may increase the likelihood of mobility.

Poverty and socio-economic status

Structural aspects of society such as cultural norms and values and the political, legal and economic environments, comprise the wider context in which individuals act and make choices around their sexual behaviour. In South Africa, socio-economic factors related to poverty and underdevelopment contribute to a context in which many South Africans may engage in sexual behaviours and practices that heighten risk of HIV transmission.

It has been noted that AIDS takes root easily in places with high levels of social exclusion, political instability and socio-economic insecurity.[56] Individuals who find themselves within such conditions – including displaced people, migrant workers, stigmatized or ostracized groups – may face higher

risks of HIV infection. Human insecurity therefore represents underlying social determinants to the spread of AIDS in Africa. The 'Jaipur paradigm',[57] which has evolved as a model for understanding the interaction between HIV and societies, suggests that wealth and social cohesion are the two key factors which inform the degree of susceptibility and the overall vulnerability of a given society to HIV.

Mobility and type of settlement

HIV prevalence rates in South Africa in urban informal areas are nearly double the rates of those in formal urban areas (17.6% vs 9.1%).[58] Factors underpinning this differential have not been clearly established, although socio-economic differences include higher levels of migration, inadequate housing, limited access to water and sanitation, social fragmentation, violence, and high levels of unemployment and poverty in informal areas. Frequent movement between settlements may be a type of coping strategy aimed at improving economic prospects, but this increased mobility may increase opportunity for greater numbers of sexual partnerships.

In relation to access to resources, various researchers have explored the conditions of life in informal settlements. This has included attention to issues such as sanitation, access to water, pollution, overcrowding, nutrition, quality of shelter and access to health services.[59] For example, a study of basic health conditions in Canaan, an informal settlement outside Durban, found that residents were at greater risk of diseases such as tuberculosis, sexually transmitted infections (STIs), asthma and diarrhoea, subsisted on diets heavy in carbohydrates and lacking in protein and fresh fruits/vegetables, had no access to piped sewerage, and accessed water through a communal tap.[60]

Whilst the underlying factors relating to HIV risk are not readily addressed in the short-term, developmental approaches that give attention to rural development and employment creation in rural areas (to mitigate rural-urban flow), alongside housing and service provision to counter informal settlement, can contribute to risk reduction. Sectors such as mining, industry and agriculture benefit considerably from migrant labour and the emphasis of workplace responses on provision of and support to ARV treatment provision is inappropriate when migrancy is the underlying factor. As Lurie notes, ways of changing support to migrants and shifting reliance on migrant workforces need to be explored: "Too often we have shied away from structural-level interventions for fear that the problems are so systemic that we cannot have an impact. But South Africa needs to decide whether a system that separates families for extended periods of time is one that should survive in the new democratic era. Alternatives include sustainable rural development programmes that offer local employment opportunities thus mitigating the need to migrate in the first place." [61]

This view suggests an emphasis on job-creation and related development approaches in rural and smaller communities to counter migration.

Effects and Responses

Another way of understanding what is required to address HIV and AIDS is by considering effects and responses. Table 6 draws on analysis by Barnett and Whiteside (2002) and shows examples of the types of effects that occur at various levels of society as a product of HIV infection and AIDS. The lower half outlines key response strategies that seek to mitigate these effects.[62] The table is structured around the effect of the epidemic at four levels – individual, family, community, and macro-level – where the effects at each successive level are felt on a larger scale by a greater number of people and where the resource and response needs at each level become greater and more complex.

Table 6: Effects and responses

Effects[63]			
Individual level	**Family level**	**Community level**	**Macro-level**
• Declining physical wellbeing • Declining psychological wellbeing • Declining ability to work • Death	• Psychological impacts on partners, children and other family members • Increased expenditure on healthcare • Changing expenditure patterns • Sale of assets • Loss of primary income • Food insecurity • Restructuring of family • Orphaning of children • Accessing/losing access to social grants	• Enshrining of rights of PLHA • Increased need for local level formal healthcare • Increased need for local level informal healthcare • Increased need to provide psychological support to school children • Increased need to provide support to orphans • Dependence on extended family and elderly for money and childcare	• Loss of production • Food insecurity • Provision of economic support/credit to affected families • Demand for resources and support to expanded healthcare and social service provision • Growing role for AIDS organisations and need for resources to support them • Need for AIDS specific political leadership
Responses			
• Nutritional management • Treatment for / management of opportunistic infections • Antiretroviral treatment • Counselling and other forms of support • Workplace support • Terminal care	• Expanded healthcare and counseling service provision • Traditional health systems • Community level home-based care • Subsidies and grants • Extended family support • Community level support • Support groups	• Legal provisions • Support to local healthcare system • Support to local NGOs and CBOs • Support within educational system • Support and grants for orphans • Support and grants to foster families	• AIDS specific economic support to communities • Income generating projects and credit schemes • Expanded policy framework for AIDS • Expanded funding for healthcare and social services • Expanded funding to NGOs and CBOs • Increased focus on multi-sectoral leadership focused on AIDS • Increased political leadership on AIDS

HIV and AIDS at individual, family and community level

People who are unaware of their HIV-positive status will at some point experience declining health, and may, as a product of this, find out their HIV status. Others may find out their status as a result of HIV testing related to pregnancy, loan and insurance applications, through responding to VCT campaigns, or simply as a product of wanting to know their HIV status.

Knowledge of HIV-positive status has immediate and long-term psychological consequences, and support is required. There is a need for healthcare provision for treatment of opportunistic infections, and while ART is an option for a growing number of HIV-positive South Africans, the fact remains that many thousands of people are presently dying without access to treatment.[64] There are also specific needs around terminal care and pastoral care, amongst others, which need to be met.

Many families become the primary caretakers of people ill with HIV and AIDS and absorb various costs in relation to the epidemic.[65] HIV and AIDS can alter family composition (e.g. children being sent to relatives to be cared for, or migrant work seeking), can lead to increased expenditure on healthcare and changes in overall expenditure patterns (including sale of assets), and places additional caregiving burdens upon family members. These tangible effects co-exist alongside a range of psychosocial effects including among others, feelings of anger, guilt, responsibility and fear. Households affected by AIDS often require support in various forms including via health and social services systems, and community-based organisations, non-governmental organisations and faith-based organisations. Extended family and community members are often sources of such assistance.

The effects of HIV and AIDS at community level are also systemic: local services related to health and welfare may come under increased strain (e.g. public health clinics, charitable projects, departments of social development and child welfare, burial space) as a result of HIV and AIDS, while institutions such as schools may be required to identify vulnerable children, to provide psychosocial support to children in challenging domestic situations and to monitor child welfare.

Community-level responses to these various needs have emerged in many areas in the form of volunteer caregivers, home-based care initiatives, and programmes for orphans and vulnerable children, amongst others. These projects help to bridge the gaps in public sector service provision, such as the backlog in processing foster care grants, and are in need of greater support to scale up their efforts.

There is evidence of a widespread organic response to the epidemic at community level that has included the activities of both informal and formal organisations. In many instances, such responses are the most immediate available form of support for people affected by and living with HIV and AIDS.

Local HIV and AIDS organisations represent a combination of specialised HIV and AIDS organisations; civil society organisations that have come to include an HIV and AIDS dimension in their work; and faith-based organisations carrying out HIV and AIDS activities. Local-level responses also interface with resources of governmental institutions (eg. clinics and hospitals), as well as local government departments, and there is networking within and between the various sectors, although the extent of this coordination is highly uneven.

Community-level organisations provide a wide range of services including prevention, care, treatment, support and rights. This includes distribution of condoms, provision of VCT, support to PMTCT and PEP. Care and support services include counseling, support for people living with HIV and AIDS (PLHA), assistance to orphans and vulnerable children (OVC), facilitation of support groups, and support to families and caregivers. Home-based care (HBC) and nutritional support is also provided. HIV and AIDS treatment is expanding in conjunction with the government's ARV rollout, and a growing number of organisations are providing treatment education and support. Legal support is also provided.

Many community-level organisations are volunteer driven and operate with few, if any, outside resources. They often require training in organisational management including fundraising, governance and financial management. Most organisations have linkages to other organisations working in the HIV and AIDS field.

Community organisations are well located to identify gaps and support needs in the context of a changing epidemic (for example, shifts toward treatment literacy in line with ARV roll-out), and the services they provide address, to varying degrees, the institutional gaps that occur alongside narrower forms of service provision within government health and social services.

Many workplaces also mount some form of HIV and AIDS response, although these vary greatly by size of company and other factors. Larger corporations and parastatals have historically been involved in HIV and AIDS response – initially focusing on understanding HIV prevalence amongst their employees, as well as involvement in workplace education and (mainly) condom distribution. More recently, a number of corporates have established programmes that provide ARVs to employees who are ill with HIV. By contrast to large corporations, few medium-sized and small businesses have active HIV and AIDS programmes.

Stigma and discrimination

Stigma and discrimination have often been seen as a primary barrier to HIV prevention and the provision of treatment, care and support. This view tends to see stigma and discrimination as a catch-all for the many complex barriers to addressing the disease,[66] at the same time suggesting that effective response is predicated on stigma and discrimination being eradicated.

The overarching global emphasis on stigma and discrimination has implied that communities and societies are dominated by values that are antagonistic to common humanity and caring. This view is however contradicted by the broad-based response to the epidemic at all levels of society including the many community-level responses that exist both formally and informally.

As the epidemic escalates, more and more people know of family members, friends and associates who have died of the disease. Whilst, in some instances, this may result in increasing stigma and discrimination, it appears to have an overall effect in the opposite direction. For example, survey of public transport commuters in South Africa in 2002 found that 37% had experienced death of a friend or relative of AIDS, 26% had helped to care for a person with AIDS, 16% were members of an AIDS club, 71% were interested in joining an AIDS club, and 90% were interested in talking about HIV and AIDS with an HIV-positive person.[67] The 2005 Nelson Mandela/HSRC survey also found low levels of stigmatising attitudes at the general population level: for example, 91% of respondents indicated that they would be willing to care for a family member with AIDS, and 80% agreed that HIV-positive children should not be separated from other children to prevent infection.[68] It is important to point out, however, that even low levels of stigma and discrimination by a small number of individuals may produce negative impacts, including hindering HIV disclosure, impeding HIV prevention (for example, condom use), and discouraging treatment.

Perceptions of widespread stigma and discrimination amongst people living with HIV and AIDS are also relevant. This 'felt stigma' may include actual experiences of stigma and discrimination, as well as assumptions of being stigmatised. Felt stigma negatively impacts on psychological wellbeing and on the process of coping with HIV and AIDS.

South Africa has a well-established constitutional and legal framework supporting PLHA and this provides a useful backdrop to enshrining non-discrimination. However, what is still required is an expanded system of practical support for legal and rights-related issues through government and civil society groups.

Antiretroviral therapy (ART)

ART has long been recognised as an important intervention for enhancing longevity of persons living with HIV and AIDS and the provision of ARVs for the treatment of persons with HIV has been

central to the activist agenda of organisations such as the Treatment Action Campaign (TAC) in South Africa. Provision of ARVs through the public health system was initiated in 2004 and the numbers of patients on ARVs is increasing. ARVs have been available within the private healthcare system for some time.

ARV programmes are complex to manage and a range of systems and processes are necessary to get patients on to the programme and to ensure that treatment is sustained. Related issues include the need for appropriate nutrition, and disability grants for people who are bedridden or unable to work (which may fall away as health status changes). There is also a need to co-ordinate services, provide psychosocial support, provide support for disclosure of status, and to address issues to do with mental health.[69]

Many people continue to die of AIDS even in the context of ARV availability. Factors underpinning AIDS deaths include lack of awareness of HIV status, limited overall access to treatment, the need for treatment literacy and the need to ensure drug adherence. Achieving maximum coverage for persons with HIV and AIDS who qualify for ART is a long-term process.

Care and support

Various forms of treatment, care and support mitigate the impacts of HIV and AIDS on people living with the disease – for example, treatment of opportunistic infections (including TB); antiretroviral therapy (and related medical care and support); psychological care (including addressing severe mental health problems); and terminal care, including palliative care.

The public health system focuses on provision of clinically oriented services, such as DOTS support for TB and the treatment of opportunistic infections. It is also at the centre of the public sector roll-out of ART. Although in some parts of the country clinics are becoming increasingly tied into referral networks and systems of community support, on the whole the public health system is unable to provide many of the basic services required by HIV-positive people and a complex of community-based structures and organisations have evolved to 'backstop' the public sector in responding to AIDS. Support groups, treatment literacy initiatives, food gardening and nutrition support, home-based caregiving and pastoral care, and support to orphans and vulnerable children are among the activities commonly undertaken by non-governmental community-based initiatives.

Faith-based organisations are particularly involved in supporting families and orphans, providing medical care, resourcing AIDS support groups, and providing counseling and pastoral care. Factors which enhance the impact and effectiveness of FBOs include the respect and trust they enjoy from the communities in which they operate and their moral authority within society as a whole; their nature as value-based institutions with direct 'jurisdiction' over issues of personal behaviour, morality, family life and belief; their regular involvement with members and followers, including direct contact with people at key life events (birth, coming of age, marriage, death); and their position as a spiritual home for members and as a source of strength, support and hope for people who are ill or in need. FBOs promote values of compassion, tolerance and care for the needy; they are embedded within communities and understand local needs and conditions; and they have long histories of delivering healthcare and other social services in poor and underdeveloped areas.

In South Africa, FBOs are well positioned to lead change processes around HIV and AIDS and international donors are already channeling HIV and AIDS funding to FBOs. Such support is related to the acknowledgement of their proximity to affected communities and their relative cost-effectiveness, which makes them useful conduits for assistance.

Orphans and Vulnerable Children (OVC)

Orphans can be defined as children under 18 years of age who have lost their mother or both biological parents, whilst vulnerable children are those whose parents are ill and dying, or who have been abused, abandoned or severely neglected.[70] Orphans and vulnerable children are referred to collectively as 'OVC.'

The number of orphans in South Africa will increase over the next 15 years in relation to growing AIDS deaths among adult parents and caregivers. It is estimated that 785,000 orphans were eligible for foster care placement in South Africa in 2003.[71]

Orphaning and child vulnerability in relation to HIV and AIDS may contribute to increasing school drop-out rates due to inability to pay school fees or the need for children to provide care or earn money to support the household.

Most orphans are cared for by relatives within their extended families, although a steadily increasing number of child-headed or youth-headed households is emerging in cases where no close relatives can be found to care for orphans.

Support for children is provided through three main government-funded support grants – Child Support Grants (means-tested for children up to age 14 in poor families), Foster Care Grants (for foster parents caring for a child who is in their custody via court order), and Care Dependency Grant (for children with special needs requiring care).[72] The Department of Social Development struggles to process applications for Foster Care Grants in particular (which are time-consuming and bureaucratic to issue and are therefore poorly suited for the large number of applicants currently seeking them) and to retain qualified social workers and this impacts on support to OVCs.

Many civil society organisations, including faith-based groups in particular, provide small-scale, localised support to OVC and, in doing so, help to stem certain gaps in governmental response. Services offered include day care, after-school clubs, feeding schemes and distribution of food parcels, life-skills workshops, and peer educator training.

Priority areas for strengthening support to OVC include better integration of government and non-governmental support services; streamlining of grant processing and grant transfers; the provision of interim assistance during grant processing windows; better identification, registration and monitoring of OVC (an area in which schools are well-positioned to assist); and the establishment of one-stop centres in communities which link medical, social and administrative processes related to child welfare.

HIV and AIDS at macro-level

As the epidemic progresses, its effects can be felt society-wide in the form of changes in the country's productive capacity, in its budgeting and domestic expenditures, in agriculture and food production, in the functioning of key institutions such as police, and in social service realms such as healthcare and education. HIV and AIDS expands already critical areas of need, including supporting affected families and strengthening healthcare and other social services.

HIV and AIDS and Food Security

HIV and AIDS has an effect on food security, including availability and stability of food supplies, access to those supplies, and patterns of food use.[73] HIV limits the amount of time family members have to engage in economic activities, and in the agricultural sector, this is related to lower levels of food production for subsistence as well as commercial agriculture. Like any other workplace, the commercial agriculture sector is impacted by absenteeism, reduced capacity and loss of skilled employees as a result of HIV and AIDS. The relationship between HIV and AIDS and food security is bi-directional: food insecurity may contribute to risky behaviours as a product of economic dependence on others, which in turn contributes to productivity declines as a product of long-term HIV infection.

Unlike other southern African countries with high HIV prevalence rates, South Africa does not fall into a high risk category for food insecurity. However it is estimated that 14 million people (35% of the population) in South Africa are vulnerable to food insecurity – a situation which may be exacerbated by HIV and AIDS. For example, the Food and Agricultural Organisation (FAO) estimates that South Africa may lose close to 20% of its commercial agriculture workforce by 2020.[74]

Abrupt climate change and shifting weather patterns have been put forward as potentially having additional dramatic impacts on food security in southern and South Africa. Observers speak of the possible emergence of 'new variant famine' in southern Africa, in which acute food insecurity becomes a chronic, irreversible state as a result of climate conditions, deepening poverty, and HIV and AIDS. It is unclear how easily or quickly government and communities can mobilise to mitigate such impacts.[75]

In South Africa, the main policy implications of the link between HIV and food insecurity relate to the important role of social grants in supporting households affected by HIV and AIDS (e.g. allowing affected households to survive illness and death, and also to preserve existing asset bases) and the need for infrastructure development, such as connections to electricity and piped water, which reduce labour-intensive tasks for households with HIV-positive members.

The health system

The health system is the most direct support system available for HIV prevention. Strengths relate to the management of STIs, distribution of condoms and provision of VCT. Weaknesses relate to the limited and inequitably distributed coverage of PMTCT, PEP and ARV programmes.[76] Improved efficiencies in the public health system are likely to be relatively slow moving, but are supported through additional resources and services being available through private healthcare.

HIV and AIDS places additional burdens on the health system. A study in Hlabisa found that hospital admissions increased by 81% during 1991-1998, with a 360% increase in ward admissions for TB, while a study of patients by the HSRC in 2002 showed HIV prevalence of 28% in all patients, and 46% amongst in-patients.[77]

Effective management of HIV and AIDS at primary level requires expansion and qualified personnel in the public sector.[78] Provision of ARVs, TB treatment, and other drug intensive treatment regimes requires meticulous adherence, whilst palliative care requires logistical support if conducted in conjunction with home-based care. Shortages of nurses and healthcare workers trained, for example, in ARV provision and support, have delayed the roll-out of certain aspects of the AIDS response through the public health sector. South Africa is among the countries most strongly affected by the migration of skilled medical personnel to northern countries.

Traditional healers have been integrated into the HIV and AIDS response at various levels, including prevention (e.g. condom promotion and safe circumcision practices), and care and support (e.g. counseling, palliative care). Research has also been conducted into the potential of traditional medicines for various aspects of HIV and AIDS.

Governmental and political response

There has been no shortage of prevention campaigns and programmes in South Africa, and billions of rands have been invested in such activities over the past decade. It is unclear why the efficiency of such programmes have been so negligible, although inadequacies in methods and lack of co-ordination are factors to be considered. International organisations and donors have promoted strategies such as the 'Three Ones' – one national strategy, one national AIDS council, one national monitoring and evaluation system – to accelerate national-level response. South Africa has had these key elements in place for some time: a national strategy has existed in various forms since the early 1990s, the South African National AIDS Council (SANAC) was established in the late 1990s, and there are numerous activities that support national-level monitoring and evaluation. However, for a complexity of reasons, these strategies have not contributed sufficiently to addressing the epidemic.

Political leadership around AIDS in South Africa has been erratic and contradictory, often sowing seeds of doubt and misinformation rather than providing clear and straightforward information about HIV and accompanying risks. Although AIDS was identified as a critical national challenge during the political transition, many other issues took precedence. The first democratic president, Nelson Mandela, has been faulted for not showing more leadership on AIDS, while the government

of Thabo Mbeki has come under harsh criticism for its lack of concerted leadership on HIV and AIDS. Whilst conflict around an appropriate response to the epidemic has been ongoing, there has been a degree of pragmatic response. There are a wide range of policies relevant to HIV and AIDS, public sector interventions such as condom procurement and distribution, VCT provision, and ARV provision are expanding, and HIV and AIDS specific budgets have been increased.

Internationally, emphasis has been placed on the notion that 'more money' is the main element that is needed to successfully combat HIV and AIDS and attention has focused on the multi-billion dollar investments in HIV and AIDS programming and research. South Africa has made extensive and escalating financial commitments to the disease,[79] and the country receives large amounts of bilateral funding for HIV and AIDS.[80] However, an overarching problem within government has been underspending of available budgets and incapacity to effectively manage programmes. A recent review by the AIDS Budget Unit of IDASA, for example, has identified the high number of vacant posts and skills shortages in government as seriously impacting on capacity to deliver HIV and AIDS-related services.[81]

Conclusions

This review has explored many aspects of HIV and AIDS and provides insights into gaps and possibilities. South Africa is not short of resources, policies and interventions, and it is surprising that, in spite of a complexity of systems and responses, the epidemic has escalated to such high levels.

Some of the most successful responses to HIV and AIDS have occurred at the grassroots level in the gay community in the United States, in relation to casual sex in Thailand, and in communities in Uganda, yet lessons learned in these contexts have not been systematically drawn upon in South Africa. In the US, strategies included reducing high partner turnover, condom promotion, provision of HIV testing, development of peer support systems for care and support, openness about death from AIDS amongst prominent gay activists, and political activism. In Thailand, condom promotion was combined with reduction in casual partnerships and visits to brothels, whilst in Uganda strong political leadership and community mobilization (including emphasis on support provision to PLHA) combined with a focus on partner reduction (most prominently expressed through the slogan 'zero grazing').[82]

There are a wide range of non-governmental organisations (NGOs) and community-based initiatives mobilising around the epidemic.These organisations carry out a broad array of HIV and AIDS activities. Most require financial and other resources, training, and other forms of support to function optimally. Many of the smaller non-governmental and community-based organisations are seriously under-resourced.[83] Apart from HIV and AIDS specific organisations there is a broad-based multisectoral response including within it government departments, teaching institutions such as schools and universities, workplaces and within faith-based organisations (FBOs), amongst others.

In spite of a broad-based response to the epidemic, however, there has been inadequate co-ordination of strategies, lack of clear leadership in Government and in many sectors, overall lack of capacity and a failure to harness local level responses in a systematic way. Whilst there is no clear answer as to how these responses might be mobilised differently, realignments in any of these areas could have significant impacts on all aspects of the epidemic in the short term. Conversely, without concerted leadership in the spheres of government and civil society, and without co-ordination, South Africa seems destined to lag behind in responding to the epidemic.

References

Abdool Karim, Q. (2005). Heterosexual transmission of HIV – the importance of a gendered perspective in HIV prevention. In Abdool Karim, Q. and Abdool Karim, S. (Eds.). HIV/AIDS in South Africa. Cambridge: Cambridge University Press.

Abdool Karim, Q. & Abdool Karim, S. (2002). The evolving HIV epidemic in South Africa. International Journal of Epidemiology, 31. 37-40.

Ahmed, S., Lutalo, T., Wawer, M., Serwadda, D., Sewankambo, N., Nalugoda, F., et al. (2001). HIV incidence and sexually transmitted disease prevalence associated with condom use: A population study in Rakai, Uganda. AIDS, 15(16). 2171-2179.

Ainsworth, M. & Teokul, W. (2000). Breaking the silence: Setting realistic priorities for AIDS control in developing countries. Lancet, 356. 55-60.

Auvert, B., Taljaard, D., Lagarde, E., Sobngwi-Tambekou. J., Sitta, R., et al. (2005) Randomized, Controlled Intervention Trial of Male Circumcision for Reduction of HIV Infection Risk: The ANRS 1265 Trial. PLoS Med 2(11): e298

AVAC. (2004). AIDS vaccine trials – getting the global house in order. New York: AVAC.

Banati, P. (2005). Scaling the epidemic: Contextualised responses to AIDS in South Africa. PhD thesis. St Edmunds College, Cambridge.

Barnett, T., Whiteside, A., & Decosas, J. (2000) The Jaipur paradigm--a conceptual framework for understanding social susceptibility and vulnerability to HIV. South African Medical Journal 90: 1098-1101

Barnett, T. & Whiteside, A. (2002). AIDS in the twenty-first century: Disease and globalisation. NY: Palgrave Macmillan.

Berger, J. (2005). Re-sexualising the epidemic: Desire, risk and HIV prevention. Development Update, 5(3). 45-67.

Birdsall, K., Hajiyiannis, H., Nkosi, Z. & Parker, W. (2004) Voluntary Counselling and Testing (VCT) in South Africa: Analysis of calls to the national AIDS Helpline. Johannesburg: CADRE.

Birdsall, K., Hajiyiannis, H., Parker, W. & Nkosi, Z. (2004). Post-exposure prophylaxis (PEP) in South Africa: Analysis of calls to the national AIDS Helpline. Johannesburg: CADRE.

Birdsall, K. & Kelly, K. (2005). Community responses to HIV/AIDS in South Africa: Findings from a multi-community survey. Johannesburg: CADRE

Bond, V. (2002). The dimensions and wider context of HIV/AIDS stigma resulting discrimination in Southern Africa. In M. Heywood, V. Bond, T. Barfod, H. Ullum, W. Silomba, G. Foster, A. Whiteside, M. O'Grady, M. Fuglesang, P. Dover, M. Hammarskjöld, B. Egerö, J. Collins & B. Rau. How can we increase and broaden our responses to HIV/AIDS? Stockholm: Swedish International Development Cooperation Agency (SIDA).

Bradshaw, D., Pettifor, A., MacPhail, C., & Dorrington, R. (2004). Trends in youth risk for HIV. In P. Ijumba, C. Day, & A. Ntuli (Eds). South African Health Review 2003/4. Durban: Health Systems Trust.

Cardo, D., Culver, D., Ciesielki, C., Srivastava, P., Marcus, C., Abiteboul, D., et al. (1997). A case control study of HIV seroconversion in healthcare workers after pericutaneous exposure. US Centers for Disease Control and Prevention Needlestick Surveillance Group. New England Journal of Medicine, 337. 1485-1490.

Coetzee, D. & Johnson, L. (2005). Sexually transmitted infections. In S. Abdool Karim & Q. Abdool Karim (Eds.), HIV/AIDS in South Africa. Cambridge: Cambridge University Press.

Cohen, J. (2005). Male circumcision thwarts HIV infection. Science, 309(5736). 860.

Cohen, J. (2001). Shots in the dark. The wayward search for an AIDS vaccine. New York: Norton & Co.

Colvin, M. (2005). Impact of AIDS – the healthcare burden. In S. Abdool Karim & Q. Abdool Karim (Eds.), HIV/AIDS in South Africa. Cambridge: Cambridge University Press. 336-350.

Crimp, D. (1990). AIDS Demo Graphics. New York: Bay Press.

Department of Health. (2001). South Africa demographic and health survey: 1998. Pretoria: Department of Health.

Department of Health. (2002). Summary report: National HIV and syphilis antenatal sero-prevalence survey in South Africa 2002. Pretoria: Department of Health.

Department of Health. (2004). National HIV and syphilis antenatal sero-prevalence survey in South Africa 2002. Pretoria: Department of Health.

Department of Health. (2005). Programme guidelines for the procurement, quality assurance, warehousing/ distribution/tracking, promotion and use of male and female condoms. Pretoria: Department of Health.

de Waal, A. & Whiteside, A. (2003). New variant famine: AIDS and food crisis in southern Africa. The Lancet, 362. 1234-1237.

Dorrington, R., Bradshaw, D., Johnson, L. & Budlender, D. (2004). The demographic impact of HIV/AIDS in South Africa: National indicators for 2004. Cape Town: The Centre for Actuarial Research, The Burden of Disease Research Unit, The Actuarial Society of South Africa.

Family Health International. (2000). Many youth face grim STD risks: Adolescents need skills and self-confidence to abstain or reduce. Network, 20(3).

Fang, C., Field, S., Busch, M., & Heyns, A. (2003). Human immunodeficiency virus-1 and hepatitis C virus RNA among South African blood donors: Estimation of residual transfusion risk and yield of nucleic acid testing. Vox Sang, 85(1). 9-19.

Fourie, P. & Schönteich, M. (n.d.) Die, the beloved countries: Human security and HIV/AIDS in Africa. Johannesburg and Pretoria: RAU and Institute for Security Studies.

Glick, P. (2005). Scaling up HIV Voluntary Counseling and Testing in Africa: What can evaluation studies tell us about potential prevention impacts? Cornell University: SAGA working paper.

Guthrie, T. & Hickey, A. (Eds.). (2005). Funding the fight: Budgeting for HIV/AIDS in developing countries. Cape Town: IDASA.

Harrison, P., Rosenberg, Z. & Bowcutt, J. (2003). Topical microbicides for disease prevention: Status and challenges. CID, 36. 1290-1294.

Heyns, A. & Swanevelder, J. (2005). Safe blood supplies. In S. Abdool Karim & Q. Abdool Karim (Eds.), HIV/AIDS in South Africa. Cambridge: Cambridge University Press.

Human Rights Watch. (2001). Scared at school: Sexual violence against girls in South African schools. New York: Human Rights Watch.

Human Sciences Research Council (HSRC). (2004). Food security in South Africa: Key policy issues for the medium term. Pretoria: HSRC

Kahn, P. (2003). Where are we in the search for an AIDS vaccine. In P. Kahn (Ed.), AIDS vaccine handbook: Global perspectives (2nd ed.). New York: AVAC.

Kelly, K. & Parker, W. (2000). Communities of practice: Contextual mediators of youth response to HIV/AIDS. Pretoria: Department of Health.

Kelly, K., Parker, W. & Gelb, S. (Eds.). (2002). HIV/AIDS, economics and governance in South Africa: Key issues in understanding response. Johannesburg: CADRE.

Kelly, K., Birdsall, K., Tshose, P., Banati, P. & Low-Beer, D. (2005). The HIV/AIDS funding environment in South Africa: A community-level perspective. Johannesburg: CADRE

Kelly, K. & Mzizi, T. (2005). The implications of ART for local AIDS care and support programmes. AIDS Bulletin, 14(1).

Kistner, U. (2003). Rape and post-exposure prophylaxis in South Africa: A review. Johannesburg: CADRE.

Koo, H., Woodsong, C., Dalberth, B., Viswanathan, M. & Simons-Rudolph, A. (2005). Context of acceptability of topical microbicides: Sexual relationships. Journal of Social Issues, 61(1). 67-93.

Lane, T., Pettifor, A., Fiamma, A. & Rees. H. (2004). Anal sex as a risk factor for HIV infection among young people aged 15-24 in South Africa: Data from a nationally representative household survey. Oral presentation, XV International AIDS Conference, abstract no. LbOrC21.

Leclerc-Madlala, S. (2003). Protecting girlhood? Virginity revivals in the era of AIDS. Agenda, 56. 16-25.

Leggett, T. (2005). Intravenous drug use in South Africa. In S. Abdool Karim & Q. Abdool Karim (Eds.), HIV/AIDS in South Africa. Cambridge: Cambridge University Press.

Low-Beer, D. & Stoneburner, R. (2004a). Behaviour and communication change in reducing HIV: Is Uganda unique? Johannesburg: CADRE.

Low-Beer, D. & Stoneburner R. (2004b). AIDS communications through social networks: Catalyst for behaviour changes in Uganda. African Journal of AIDS Research, 3(1). 1-13.

Lurie, M. (2002). Migration and AIDS in southern Africa: Challenging common assumptions. A&M News, 4. 11-12.

Lurie, M. (2004). The epidemiology of migration and AIDS in South Africa. Centre on Migration, Policy and Society Working Paper No. 5, University of Oxford.

Magongo, B., Magwaza, S., Mathambo, V. & Makhanya, N. (2002). National report on the assessment of the public sector's Voluntary Counselling and Testing programme. Durban: Health Systems Trust.

Mantell, J., Myer, L., Carballo-Diéguez, A., Stein, Z., Ramjee, G., Morar, N. et al. (2005). Microbicide acceptability research: Current approaches and future directions. Social Science and Medicine, 60. 319-330.

Meintjies, H., Budlender, D., Giese, S. & Johnson, L. et al. (2003). Children 'in need of care' or in need of cash? Questioning social security provisions for orphans in the context of the South African AIDS pandemic. South Africa: University of Cape Town, Children's Institute and the Centre for Actuarial Research (CARE).

Newell, M., Brahmbhatt, H. & Ghys, P. (2004). Child mortality and HIV infection in Africa: a review. AIDS, 18 (suppl 2). S27–S34.

Newell, M., Coovadia, H., Cortina-Boria, M. Rollins, N. Gaillard, P. & Dabis, F. (2004). Mortality of infected and uninfected infants born to HIV-infected mothers in Africa: A pooled analysis. The Lancet. 364. 1236-43.

Parker, W., Oyosi, S., Kelly, K. & Fox, S. (2002). On the move: The response of public transport commuters to HIV/AIDS in South Africa. Johannesburg: CADRE.

Parker, W. (2004). Rethinking conceptual approaches to behaviour change: The importance of context. Johannesburg: CADRE.

Parker, W., Nkosi, Z., Birdsall, K. & Hajiyiannis, H. (2004). Breaking the barriers: An analysis of condom-related calls to the national AIDS Helpline. Johannesburg: CADRE.

Parker, W. & Birdsall, K. (2005). HIV/AIDS, stigma and faith-based organisations: A review. Johannesburg: CADRE

Pettifor, A., Rees, H., Steffenson, A., Hlongwa-Madikizela, L., MacPhall, C., Vermaak, K., et al. (2004). HIV and sexual behavior among South Africans: A national survey of 15-24 year olds. Johannesburg: Reproductive Health Research Unit, University of Witwatersrand.

Pilcher, C.D., Price, M.A., Hoffman, I.F., Galvin, S., Martinson, F.E., Kazembe, P.N., Eron, J.J., Miller, W.C., Fiscus, S.A., Cohen, M.S. (2004). Frequent detection of acute primary HIV infection in men in Malawi. AIDS. 2004 Feb 20;18(3):517-24.

Pronyk, P., Kim, J., Makhubele, M., Hargreaves, J., Mohlala, R. & Hausler, H. (2002). Introduction of voluntary counselling and rapid testing for HIV in rural South Africa: from theory to practice. AIDS Care, 14(6). 859-865.

Republic of South Africa. (2003). Criminal Law: Sexual offences Amendment Bill. Introduced in the National Assembly as a section 75 Bill; explanatory summary of Bill published in Government Gazette No. 25282 of 30 July 2003.

Rehle, T. & Shisana, O. (2003). Epidemiological and demographic HIV/AIDS projections: South Africa. African Journal of AIDS Research, 2(1). 1–8.

Richter, L. (2001). Beyond AIDS orphans: Slipping through the safety net. ChildrenFIRST, 38(9). 30-33.

Sethosa, E. & Peltzer, K. (2005). Evaluation of HIV counselling and testing, self-disclosure, social support and sexual behaviour change among a rural sample of HIV reactive patients in South Africa. Curationis, 28(1). 29-41.

Shelton, J., Halperin, D., Nantulya, V., Potts, M., Gayle, H. & Holmes, K. (2004). Partner reduction in HIV prevention: The neglected middle child of "ABC". Washington: USAID.

Shilts, R. (2000). And the band played on. New York: St Martin's Press.

Shisana, O., Hall, E., Maluleke, K.R., Stoker, D.J., Schwabe, C., Colvin, M., et al (2002). The impact of HIV/AIDS on the health sector: National survey of health personnel, ambulatory and hospitalised patients and health facilities 2002. Cape Town: HSRC Press.

Shisana, O. et al. (2002). Nelson Mandela/HSRC study of HIV/AIDS: South African national HIV prevalence, behavioural risks and mass media. Household survey 2002. Cape Town: HSRC.

Shisana, O., Mehtar, S., Mosala, T., Zungu-Dirwayi, N., Rehle, T., Dana, P. et al. (2004). HIV risk exposure among young children: A study of 2–9 year olds served by public health facilities in the Free State, South Africa. Cape Town: HSRC.

Shisana, O., Peltzer, K., Zungu-Dirwayi, N. & Louw, J. (Eds). (2005). The health of our educators: A focus on HIV/AIDS in South African public schools, 2004/5 survey. Cape Town: HSRC Press.

Shisana, O. Rehle, T., Simbayi, L.C., Parker, W., Zuma, K., Bhana, A., Connolly, C., Jooste, S., Pillay, V., et al. (2005). South African national HIV prevalence, HIV incidence, behaviour and communications survey, 2005. Cape Town: HSRC Press.

Smart, R. (2003). Policies for orphans and vulnerable children: A framework for moving ahead. Washington: Policy Project.

Solomon, V., van Rooyen, H., Griesel, R., Gray, D., Stein, J & Nott, V. (2004). Critical review and analysis of voluntary counselling and testing literature in Africa. Durban: Health Systems Trust.

Strode, A. & Barrett Grant, K. (2004). Understanding the institutional dynamics of South Africa's response to the HIV/AIDS pandemic. Cape Town: IDASA.

Teljeur, E. (2002). Response of non-governmental organisations, community-based organisations and communities. In K. Kelly, W. Parker, & S. Gelb (Eds.), HIV/AIDS, economics and governance in South Africa: Key issues in understanding response. Johannesburg: CADRE.

Thomas, P. (2001). Big shot. Passion, politics and the struggle for an AIDS vaccine. New York: Public Affairs.

UNAIDS/WHO. (2004). Policy statement on HIV testing. Geneva: UNAIDS

Weller, S., & Davis, K. (2004). Condom effectiveness in reducing heterosexual HIV transmission (Cochrane Review). The Cochrane Library, Issue 4. Chichester, UK: John Wiley & Sons, Ltd.

Wilson, D. (2004). Partner reduction and the prevention of HIV/AIDS: The most effective strategies come from within communities. British Medical Journal, 328. 848–849.

Wilson, D. & Fairall, L. (2005). Challenges in managing AIDS in South Africa. In S. Abdool Karim & Q. Abdool Karim (Eds.), HIV/AIDS in South Africa. Cambridge: Cambridge University Press.

Woodsong, C. (2004). Covert use of topical microbicides: Implications for acceptability and use. Perspectives on Sexual and Reproductive Health, 36(3). 127-131.

Woodsong, C. & Severy, L. (2005). Generation of knowledge for reproductive health technologies: Constraints on social and behavioral research. Journal of Social Issues, 61(1). 193-205.

Wulfsohn. A. et al. (2003). Post-exposure prophylaxis after sexual assault in South Africa. Presentation to 10th Conference on Retroviruses and Opportunistic Infections, Boston.

End Notes

1. Potentially as a result of their avoiding pregnancy because of their HIV status, or as a result of infertility associated with STIs and HIV.
2. At present the analysis is limited to provincial distribution or age distribution, without complex statistical analysis at province or district/cluster level.
3. For example, less predominant race groups, mobile persons.
4. Modelling conducted by Nathea Nicolay using ASSA2003.
5. See Shisana, O., Peltzer, K., Zungu-Dirwayi, N. & Louw, J. (Eds). (2005); Shisana, O., Hall, E., Maluleke, K. et al. (2004); Shisana, O., Mehtar, S., Mosala, T., Zungu-Dirwayi, N., Rehle, T., Dana, P. et al. (2004); Shisana, O., Hall, E., Maluleke, K.R., Stoker, D.J., Schwabe, C., Colvin, M., et al (2002).
6. See www.assa.org.za.
7. Modelling conducted by Nathea Nicolay using ASSA2003.
8. Shisana, O. et al. (2005). p. 34.
9. Shisana, O. et al. (2005). p. 35.
10. Racial categories as defined by the SA census. HIV prevalence amongst Whites, Coloureds and Indians is presently unclear. The first Mandela/HSRC survey had HIV prevalence rates of 12.9% for Blacks, 6.2% for Whites, 6.1% for Coloureds, and 1.6% for Indians. The RHRU survey (Pettifor et al. 2004), which was limited to young people 15-24 had rates of 11.8% for Blacks, 2.0% for Whites, 3.8% for Coloureds and 0.9% for Indians.
11. Modeling conducted by Nathea Nicolay using ASSA2003. Note that some projections of totals use the midpoint of June 30/July 1 and reflect estimates for the previous 12 months from that point.
12. See Shisana, O., Peltzer, K., Zungu-Dirwayi, N. & Louw, J. (Eds). (2005); Shisana, O., Hall, E., Maluleke, K.R., Stoker, D.J., Schwabe, C., Colvin, M., et al (2002); Shisana, O., Mehtar, S., Mosala, T., Zungu-Dirwayi, N., Rehle, T., Dana, P. et al. (2004).
13. See Shisana, O., Peltzer, K., Zungu-Dirwayi, N. & Louw, J. (Eds). (2005); Shisana, O., Hall, E., Maluleke, K.R., Stoker, D.J., Schwabe, C., Colvin, M., et al (2002); Shisana, O., Mehtar, S., Mosala, T., Zungu-Dirwayi, N., Rehle, T., Dana, P. et al. (2004).
14. Shisana, O. et al. (2005). p. 47-49.
15. Dorrington, R., Bradshaw, D., Johnson, L. & Budlender, D. (2004); Rehle, T. & Shisana, O. (2003).
16. Department of Health. (2002/2004).
17. Modelling conducted by Nathea Nicolay using ASSA2003.
18. Modelling conducted by Nathea Nicolay using ASSA2003. See also Dorrington, R., Bradshaw, D., Johnson, L. & Budlender, D. (2004); Rehle, T. & Shisana, O. (2003).
19. Dorrington, R., Bradshaw, D., Johnson, L. & Budlender, D. (2004).
20. Modelling conducted by Nathea Nicolay using ASSA2003.
21. Modelling conducted by Nathea Nicolay using ASSA2003. Note that some projections of totals use the midpoint of June 30/July 1 and reflect estimates for the previous 12 months from that point.
22. Modelling conducted by Nathea Nicolay using ASSA2003
23. Fang, C., Field, S., Busch, M., & Heyns, A. (2003).
24. Heyns, A. & Swanevelder, J. (2005).
25. Colvin, M. (2005).
26. Shisana, O., Mehtar, S., Mosala, T., Zungu-Dirwayi, N., Rehle, T., Dana, P. et al. (2004).
27. Shisana. (2002).
28. Leggett, T. (2005).

29. Newell, M., Brahmbhatt, H. & Ghys, P. (2004); Newell, M., Coovadia, H., Cortina-Boria, M. Rollins, N. Gaillard, P. & Dabis, F. (2004).
30. Dorrington, R., Bradshaw, D., Johnson, L. & Budlender, D. (2004).
31. Coetzee, D. & Johnson, L. (2005). p. 197; Department of Health (2005), National HIV and Syphilis Antenatal Seroprevalence Survey in South Africa 2004. Pretoria, Department of Health.
32. Weller, S. & Davis, K. (2004).
33. Ahmed, S., Lutalo, T., Wawer, M., Serwadda, D., Sewankambo, N., Nalugoda, F., et al. (2001).
34. Department of Health. (2001); Shisana, O. et al. (2005). p. 65.
35. Shisana, O. et. al. (2002). p. 73.
36. Department of Health, (2005).
37. Shisana, O. et al. (2005). p. 65.
38. Pettifor, A., Rees, H., Steffenson, A., Hlongwa-Madikizela, L., MacPhall, C., Vermaak, K., et al. (2004). p. 45.
39. Shisana, O. et. al. (2005). p. 65.
40. Solomon, V., van Rooyen, H., Griesel, R., Gray, D., Stein, J & Nott, V. (2004); Glick, P. (2005); Pronyk, P., Kim, J., Makhubele, M., Hargreaves, J., Mohlala, R. & Hausler, H. (2002); Magongo, B., Magwaza, S., Mathambo, V. & Makhanya, N. (2002).
41. Birdsall, K., Hajiyiannis, H., Nkosi, Z. & Parker, W. (2004).
42. UNAIDS/WHO. (2004).
43. Sethosa, E. & Peltzer, K. (2005); Birdsall, K., Hajiyiannis, H., Parker, W. & Nkosi, Z. (2004); Cardo, D., Culver, D., Ciesielki, C., Srivastava, P., Marcus, C., Abiteboul, D., et al. (1997); Kistner, U. (2003); Wulfsohn, A. et al. (2003).
44. AVAC. (2004).
45. See Kahn, P. (2003); Thomas, P. (2001); Cohen, J. (2001).
46. See Harrison, P., Rosenberg, Z. & Bowcutt, J. (2003); Koo, H., Woodsong, C., Dalberth, B., Viswanathan, M. & Simons-Rudolph, A. (2005); Woodsong, C. & Severy, L. (2005); Woodsong, C. (2004); Mantell, J., Myer, L., Carballo-Diéguez, A., Stein, Z., Ramjee, G., Morar, N. et al. (2005).
47. Auvert et al. (2005).
48. UNAIDS. (2005). UNAIDS statement on South African trial findings regarding male circumcision and HIV. Rio de Janeiro, 26 July 2005.
49. See Barnett, T. & Whiteside, A. (2002). p78.
50. Shisana, O. et. al. (2005). p. 58-61. The report does not state however, whether these variations are significant.
51. Shisana, O. et. al. (2005). p. 55-56.
52. Pilcher et al. (2004)
53. Abdool Karim, Q. (2005). p. 255.
54. Shisana, O. et. al. (2005). p. 34.
55. Greater biological vulnerability is a product of a larger receptive area of the vagina, greater vulnerability where vaginal lubrication is poor, greater likelihood of undetected STIs, greater concentration of HIV in semen, greater potential exposure to receptive anal intercourse.
56. Fourie, P. & Schonteich, M. (n.d.). Die, the Beloved Countries: Human Security and HIV/AIDS in Africa. Johannesburg and Pretoria: RAU and ISS.
57. Advanced by Barnett et al. (2000).
58. Shisana et al. 2005, p36. See also Connolly C, Colvin M, Shisana O, Stoker D, The epidemiology of HIV in South Africa: Results of a national, community-based survey. S Afr Med J. 2004;94:776-81.
59. Cunnan & Maharaj, 2000; Murdock, 2003; Simpson & Raniga, 2004; Stevens, 2003.
60. Cunnan & Maharaj, 2000.

61. Lurie, M. (2002). This study explored the HIV status of miners and their partners and it was found that of the serodiscordant couples (where one was HIV positive and the other HIV negative), a third of cases involved HIV positive women who had HIV negative partners. This counters the dominant discourses that construct migrant males as the only vectors of HIV infection, with women as passive asexual 'recipients of infection, whilst also highlighting the breakdown of the family as an important factor in transmission of HIV.

62. For an expanded discussion on impacts and responses see Barnett, T. & Whiteside, A. (2002). p. 159-346.

63. For an overview of underlying issues see Kelly, K., Parker, W. & Gelb, S. (Eds.). (2002).

64. Sustained longevity is also not necessarily likely, even with increased availability of ART, unless this is accompanied with systems of ensuring treatment literacy, and that drug supplies are sustained.

65. See Teljeur, E. (2002). Also de Waal, A. & Whiteside, A. (2003).

66. Bond (2002:34) notes the need to be cautious when conducting stigma research, as 'it is easy to fall into a trap of labeling attitudes or acts as an example of stigma without examining other possible motives' and that there is a need to 'look at the wider context… stigma is not the whole picture, but one important part of the wider picture'. See also Parker, W. & Birdsall, K. (2005).

67. Parker, W., Oyosi, S., Kelly, K. & Fox, S. (2002).

68. Shisana, O. et al. (2005). P. 92.

69. See Kelly, K. & Mzizi, T. (2005).

70. Meintjies, H., Budlender, D., Giese, S. & Johnson, L. et al. (2003); Smart, R. (2003).

71. Meintjies, H., Budlender, D., Giese, S. & Johnson, L. et al. (2003).

72. Meintjies, H., Budlender, D., Giese, S. & Johnson, L. et al. (2003).

73. See Human Sciences Research Council (HSRC). (2004).

74. Human Sciences Research Council (HSRC). (2004).

75. De Waal, A. & Whiteside, A. (2003).

76. There is also the need for research in related areas of reproductive health – for example, an association between contraception (particularly injectable contraceptives) and HIV risk. Contraceptive use, particularly amongst youth, may contribute to disinclination to use condoms. See Banati, P. (2005).

77. Colvin, M. (2005).

78. Wilson, D. & Fairall, L. (2005). Note that the private sector healthcare is accessed by 20% of South Africans, and that this group is less likely to be affected by HIV/AIDS.

79. Town: AIDS Budget Unit of IDASA.

80. See Guthrie, T. & Hickey, A. (2004).

81. Guthrie, T. & Hickey, A. (2005).

82. See Crimp, D. (1990); Shilts, R. (2000); Ainsworth, M. & Teokul, W. (2000); Low-Beer, D. & Stoneburner R. (2004a); Low-Beer, D. & Stoneburner R. (2004b).

83. See Kelly, Birdsall, Tshose, Banati and Low-Beer (2005).

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