



Government of South Africa



KNOW YOUR HIV EPIDEMIC (KYE) REPORT:
REVIEW OF THE HIV EPIDEMIC IN
SOUTH AFRICA

2011



KYE



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FOREWORD

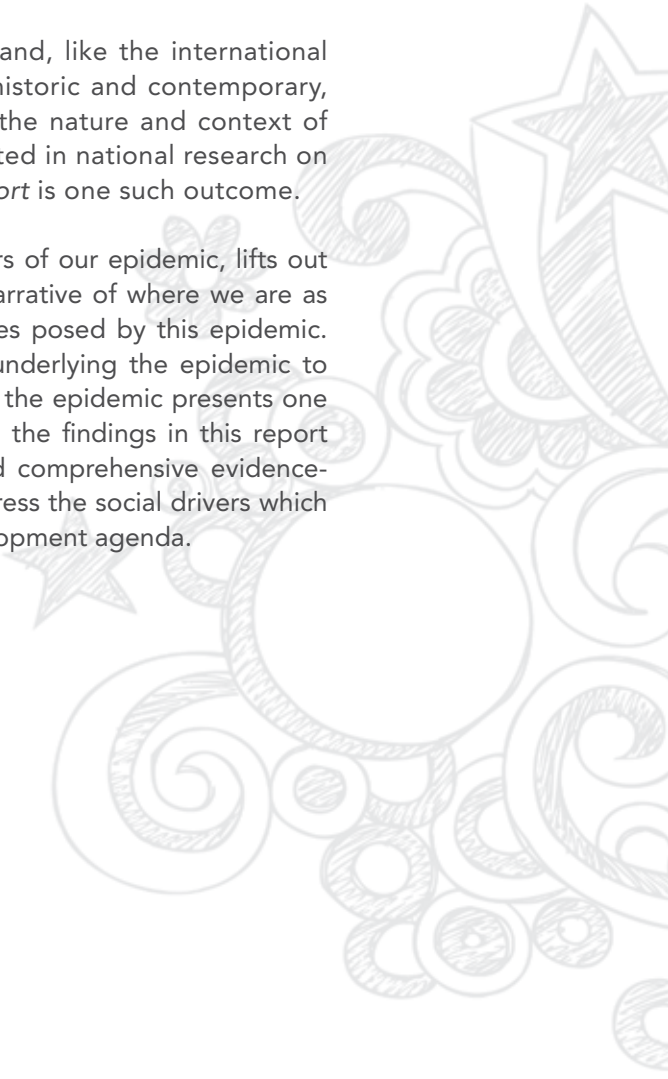
REVIEW OF THE STATUS OF THE HIV EPIDEMIC

The year 2011 is a critical milestone in the history of AIDS. It marks 30 years since the discovery of the Human Immunodeficiency Virus and thus three decades since humankind started grappling with understanding and constraining this virus. The virus has proven its resilience and demonstrated an incredible capacity to mutate and evade many of our efforts to contain it; however, this has not deterred us from seeking the means to detect this cruel intruder.

In spite of our many disappointments, significant progress has been made across a wide spectrum of areas. These include the scientific, biomedical, epidemiological, social and biological aspects of the epidemic. This progress had enabled significant strides to be made in reducing the rates of new infections, slowing down disease progression, understanding modes of transmission better and successes, however limited in decreasing morbidity and mortality due to this pandemic.

South Africa has more than five million people living with HIV and, like the international community, we have confronted our national challenges, both historic and contemporary, and can rightly claim to be in a better position to understand the nature and context of our epidemic. An incredible amount of resources has been invested in national research on many aspects of the epidemic and this *Know Your Epidemic Report* is one such outcome.

This report is unique in that it elaborates extensively on the drivers of our epidemic, lifts out specific areas of focus for our interrogation and provides a rich narrative of where we are as a country with respect to the context and nature of the challenges posed by this epidemic. This report provides a holistic account of the key determinants underlying the epidemic to date. It further underscores the importance of acknowledging that the epidemic presents one of the major challenges of our young democracy. Going forward, the findings in this report provide rich guidance to enable us to design more strategic and comprehensive evidence-informed interventions to reduce new infections and better to address the social drivers which are consistent with the challenges emanating from our broad development agenda.



I would like to encourage all stakeholders engaged in our response to use the information contained in this report to inform all HIV-related strategies and programmes as we scale up and strengthen our efforts across all sectors. Fundamental strides continue to be made and it is my wish that we continue to engage one another in this space to advance a united front in the fight against HIV and AIDS.

Furthermore, let me also express my gratitude to all those who worked tirelessly to collate, analyse and produce this excellent report. I would like to encourage you to continue in your efforts because we need our understanding of this epidemic to be reflected and fully represented in the world's discourse on HIV and AIDS.

An AIDS-free world is possible in our lifetime; let us continue to strive to achieve this vision, together.



Kgalema Motlanthe

KGALEMA MOTLANTHE
CHAIRPERSON: SOUTH AFRICAN NATIONAL AIDS COUNCIL

27 October 2011



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ACKNOWLEDGEMENTS

The South African National AIDS Council (SANAC) acknowledges the support of the World Bank in its efforts to direct HIV-prevention efforts better in the country. The World Bank provided technical support to the South African Government in two areas: (a) a comprehensive review of the South African HIV epidemic and (b) production of a synthesis report that answers three research questions relating to the HIV epidemic in South Africa. This report constitutes the first of the two deliverables, and provides a comprehensive review of the HIV epidemic in South Africa: trends, magnitude, drivers and risk factors.

The World Bank is a co-sponsor of the Joint United Nations Programme on HIV/AIDS (UNAIDS) and is part of the UN Joint Team on AIDS (UNJT) in South Africa. We would like to acknowledge UNAIDS for its coordination of the UNJT and inputs into the synthesis efforts.

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Dr Patrick Osewe, World Bank
Dr Martina Morris and Leslie Cook for the concurrency data analyses
Members of the Global HIV/AIDS Program team at the World Bank
Dr Alex Welte and other members of the South African Centre for Epidemiological Modelling and Analysis (SACEMA) team

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ACRONYMS

95% CI	95% confidence interval
ACDIS	Africa Centre Demographic Information System
AFM	age at first marriage
AFS	age at first sex
AIDS	acquired immunodeficiency syndrome
ANC	antenatal care
aOR	adjusted odds ratio
ART	antiretroviral therapy
ARV	antiretroviral
ASSA	Actuarial Society of South Africa
CAPS	Cape Area Panel Study
CSP	concurrent sexual partnerships
DHS	demographic and health survey
DOH	Department of Health
DPSA	Department for Public Service and Administration
EC	Eastern Cape (province)
EPP	estimation and projection package
FS	Free State (province)
FSW	female sex worker
GP	Gauteng Province
HDA	Health & Development Africa
HEAIDS	Higher Education HIV/AIDS Programme
HIV	human immunodeficiency virus
HR	hazard ratio
HSRC	Human Sciences Research Council
HSV	herpes simplex virus
IDU	injecting drug use/user
IMAGE	Intervention with Microfinance for AIDS & Gender Equity
IPV	intimate partner violence
JEMS	Johannesburg/eThekweni Men's Study
JHHESA	Johns Hopkins Health and Education in South Africa
KYE	Know Your Epidemic
KYR	Know Your Response
KZN	KwaZulu-Natal (province)
LP	Limpopo Province
MC	male circumcision
MCP	multiple concurrent partnerships
MP	Mpumalanga Province
MSM	men who have sex with men
MSP	multiple sexual partnerships
MTCT	mother-to-child transmission
MTR	mid-term review
NC	Northern Cape (province)
NCS	National Communication Survey
NGO	non-governmental organization

NSP	National HIV and AIDS Strategic Plan
NW	North West (province)
OR	odds ratio
PAR	partner acquisition rate
PEP	post-exposure prophylaxis
PLHIV	persons living with HIV
PMTCT	prevention of mother-to-child transmission
PSA	prostate specific antigen
RST-ESA	UNAIDS Regional Support Team for East and Southern Africa
SACEMA	South African Centre for Epidemiological Modelling and Analysis
SANAC	South Africa National AIDS Council
SANBS	South African National Blood Service
STD	sexually transmitted disease
STI	sexually transmitted infection
SW	sex worker
UAI	unprotected anal intercourse
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNGASS	United Nations General Assembly Special Session on HIV/AIDS
UNJT	United Nations Joint Team on HIV/AIDS
VCT	voluntary counselling and testing
WC	Western Cape (province)
WHO	World Health Organization
WPTBS	Western Province Blood Transfusion Service



EXECUTIVE SUMMARY

This review of the HIV epidemic in South Africa is one of four component reports of an assessment of the HIV epidemic and prevention response in South Africa. The assessment was commissioned by the Government of South Africa and realized jointly by several partners and contractors, under the coordination of the UNAIDS secretariat in South Africa, with technical support from the World Bank and others. The primary objective of this component, the review of the HIV epidemic, is **to contribute to ongoing efforts to understand the HIV epidemic better and help develop the best possible approach to HIV prevention.**

Specifically, the HIV epidemic review aims to:

1. describe the level of heterogeneity of the South African HIV epidemic and comment on any sub-epidemics that can be delineated within the national epidemic;
2. identify the populations at greatest risk of HIV infection based on analysis of the distribution of new infections;
3. establish the factors driving the HIV epidemic through an analysis of national and provincial behavioural, biological, socioeconomic and demographic data;
4. provide an epidemiologic evidence base for formulating evidence-informed, better targeted, more effective prevention strategies and actions.

The assessment was conducted through a desk review of existing published and unpublished literature. Secondary bivariate and multivariate data analysis was carried out on all recent population-based HIV and sexual behaviour data, namely the three national bio-behavioural surveys of 2002, 2005 and 2008 by the Human Sciences Research Council (HSRC), and the two National Communication Surveys (NCS) of 2006 and 2009 by Health & Development Africa (HDA) and Johns Hopkins Health and Education in South Africa (JHHESA). More than 700 relevant reports and publications were reviewed, catalogued and data extracted on South Africa's HIV epidemic.

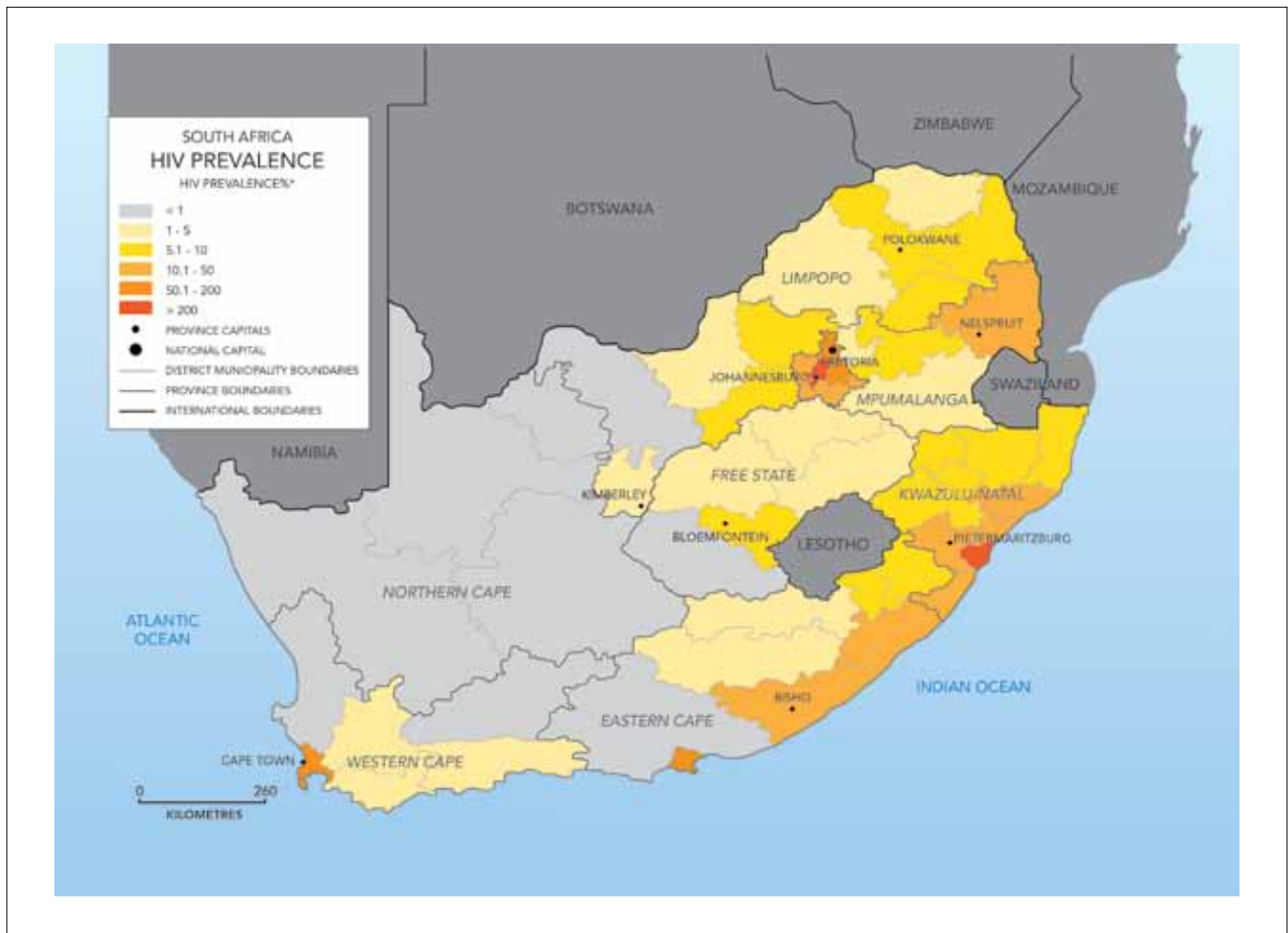
Levels and trends in HIV prevalence

Data from both population-based serosurveys and sentinel surveillance of pregnant women suggest that the HIV epidemic has plateaued in South Africa. In adults aged 15–49 the three HSRC surveys estimated HIV prevalence at 15.6% (2002), 16.2% (2005) and 16.9% (2008, increase not statistically significant). In antenatal care (ANC) clients, HIV prevalence has gradually levelled off just below 30%, after steeply increasing for more than 10 years from 7.6% in 1994 to 29.5% in 2004. The ANC prevalence estimates for 2006, 2007, 2008 and 2009 are very similar with 29 of 100 sampled ANC clients HIV-positive (the 2009 result was 29.4% with a 95% confidence interval of 28.7–30.2%). Although **the percentage of HIV-positive people – HIV prevalence – has plateaued, the absolute number of people living with HIV (PLHIV) is on a steep increase** of approximately 100 000 additional people each year. The estimated number of PLHIV in 2009 was 5.63 million (Spectrum, in line with the ASSA 2008 model estimate of 5.5 million for 2010; ASSA, 2011). There is a **substantial downturn in AIDS-related mortality** in recent years, with the annual number of AIDS deaths reduced from about 257 000 in 2005 to about 194 000 in 2010 (ASSA, 2011). This is **largely due to the expansion of the ART programme.**

There is tremendous heterogeneity in provincial HIV-prevalence levels, ranging from 3.8% in the Western Cape to 15.8% in KwaZulu-Natal in 2008. Compared to men in the Western Cape, men in KwaZulu-Natal, Mpumalanga and the North West province were significantly more likely to be HIV-positive (2008, multivariate analysis). Women in Mpumalanga and KwaZulu-Natal were also significantly more likely to be HIV-positive. Provincial HIV-prevalence

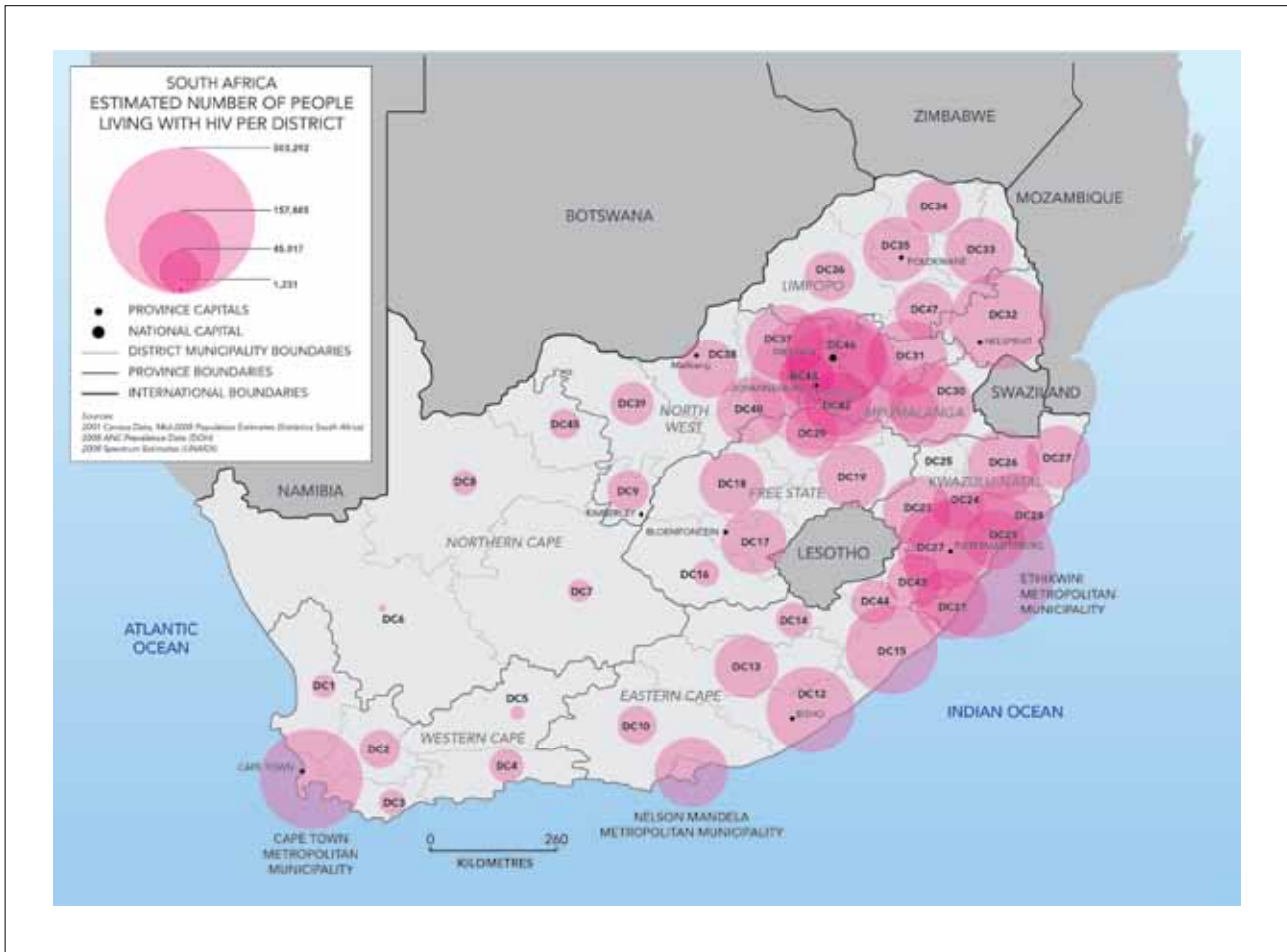
levels appear to have stabilised in recent years, which is in line with the trends in national HIV prevalence. **There are even larger differences** in HIV-prevalence data from ANC sentinel surveillance studies **across health districts**. They range from a low of 0% (0/68) in Namakwa, Northern Cape, to a high of 46.4% in Uthukela, KwaZulu-Natal. There is evidence of localised high HIV transmission in areas such as close to national roads.

Figure 1: Maps of South Africa showing estimated density (left) and clustering (right) of people living with HIV



Sources: 2001 census data, mid-2008 population estimates (Statistics SA), 2008 ANC HIV-prevalence data (DOH), and 2008 Spectrum estimates (UNAIDS), Land area (District Municipalities).





Sources: 2001 census data, mid-2008 population estimates (Statistics SA), 2008 ANC HIV-prevalence data (DOH), 2008 Spectrum estimates (UNAIDS).

Women aged 15 and above are significantly more likely to be HIV-positive than men. This holds true in all provinces except the Northern Cape and North West. HIV prevalence in women showed a significant increase between the 2005 and the 2008 survey from 15.1% to 17.4%, while men's HIV prevalence stayed at 10%. This increase in women is attributed to the effect of antiretrovirals (ARVs). The majority of adult PLHIV (54%) live in just two provinces, KwaZulu-Natal and Gauteng (more than their 44% share of the South African population).

HIV prevalence in young women is much higher than in young men, especially in the 20–24 age group. In 2008, HIV prevalence was more than four times higher in women aged 20–24 (21.1% HIV-positive) than in men aged 20–24 (5.1%). There is **evidence of a downturn in HIV prevalence in youth aged 15–19 and 20–24 between 2005 and 2008.** In youth aged 15–24, the prevalence drop between the two surveys is 3% for females and 0.8% for males (differences not statistically significant). This downturn is encouraging, and it is corroborated by mathematically derived HIV-incidence data for this age group. Overall, ANC-based and female population-based data tell the same story: in young women below the age of 30, HIV-prevalence levels show a downward trend, whereas in older women, HIV prevalence is increasing.

Race is an important epidemiological variable because it reflects socioeconomic contexts that influence risk of HIV infection. The black African population of South Africa has the highest level of HIV infection. Coloured people are 3.4 times less likely to be HIV-positive than black Africans, Indians 16.2 times less likely and whites 7.8 times less likely, based on the available data from the 2008 survey. HIV-prevalence levels in the black African population show a small, non-significant upward trend over the three surveys, and ARV use is again thought to contribute to this. The Cape Area Panel Survey provides evidence that differences in sexual partnership patterns, especially sexual concurrency of both partners at the same time, explain some of the racial differences in transmission of

HIV and sexually transmitted infections (STIs).

There is a **trend of increasing age at first marriage** in South Africa, especially in women, leading to long periods of time spent single and sexually active. Secondary data analysis revealed associations between marital status and HIV status. In 2008, married women had lower odds of HIV infection than unmarried women. While married women in their twenties, thirties and forties had the odds of HIV infection of unmarried teenage girls, unmarried women in these older age groups had significantly higher odds of HIV infection. For men, marriage was not important for their likelihood of being HIV infected.

Similar to marriage, **higher education appeared to have a protective effect against HIV**. Based on HSRC survey data, men and women with tertiary education were significantly less likely to be HIV-positive than those with no school education. Students, as opposed to the unemployed, were also significantly less likely to be HIV-positive. In 2008 in the Eastern Cape and KwaZulu-Natal, men with matriculation (graduated from high school) or tertiary education were significantly less likely to be HIV-positive than those with less education.

Low economic status was identified as a risk factor for HIV infection. Economic deprivation was linked to significantly higher HIV prevalence, especially in black Africans. Respondents working in the informal sector had overall the highest HIV prevalence among the different employment groups, with almost one third of black African informal workers HIV-positive. In women, the greater the lack of money, the more likely they were to be HIV-positive.

The type of residence area is also associated with the likelihood of being infected with HIV. Several studies have found that **urban informal areas are linked to the highest HIV-prevalence** levels, compared to urban formal, rural informal and rural formal areas. In 2008, women living in urban informal areas were 57% more likely to be infected with HIV than those in urban formal areas. In urban formal areas, HIV prevalence has fallen since 2002 by about 3% (not statistically significant). In contrast, in rural areas HIV prevalence increased by more than 5% between 2002 and 2008 (increase statistically significant for rural informal areas).

Male circumcision (MC) has been shown in the South African MC efficacy trial at Orange Farm near Johannesburg **to reduce men's risk of getting infected with HIV by 61%**. In the HSRC 2005 survey, men who reported having been circumcised before first sex were significantly less likely to be HIV-positive. In South Africa, MC is mainly performed on young people as part of initiation rites of passage into manhood, primarily among the Venda, Pedi, Ndebele and Tsonga, as well as the Xhosa and South Sotho. The procedure often takes place after sexual debut. Neonatal MC is mainly a custom among Jewish and Muslim populations. The prevalence of reported MC varies by province with the highest levels in the Free State and Western Cape (71% and 68%, respectively), and the lowest levels in Gauteng (25%) and KwaZulu-Natal (27%). Recent data show that a large proportion of South African men in South Africa would consider undergoing the procedure, and men and women are supportive of MC.

Estimations of HIV incidence

South Africa has considerable experience in the use of a variety of methods to estimate HIV incidence (new HIV infections). HIV incidence is a key prevention impact indicator in the national HIV response. The main prevention goal of the National HIV and AIDS Strategic Plan (NSP) 2007–2011 is to reduce the rate of new HIV infections by 50% by 2011 (this would mean that the HIV incidence – the percentage of the population who become newly infected each year – would have fallen from 1.3% in 2007 to 0.65% in 2011).

Incidence estimation in young people aged 15–20 suggests that although youth in their teens prevented infections more effectively in 2008 than in 2002, they still rapidly acquire new HIV infections as they get into their twenties. One incidence estimation method suggested that HIV incidence may have declined by 60% in young women



aged 15–24 between the inter-survey periods 2002–2005 and 2005–2008. However, **the country seems far off track from achieving the NSP prevention goal.** In summary, the different methods to estimate HIV incidence suggest **annual incidence of 2.0–2.4% in the first half of the 2000s and about 1.2–1.7% in the second half of the 2000s.**

There is important local and regional evidence from Uganda, Malawi and Zimbabwe that **HIV incidence is particularly high in pregnancy and the postpartum period.** Recent evidence from serodiscordant couples in the Partners in Prevention HSV/HIV Transmission Study, in which South Africa participates, suggests that the risk of men being infected by HIV doubles when their partners are pregnant.

From the Africa Centre HIV cohort in KwaZulu-Natal, very high lifetime risks of HIV infection have been reported: lifetime risk at age 55 is estimated at 78% for males and 75% for females. Compared to other HIV-monitoring sites in sub-Saharan Africa, HIV incidence in the Africa Centre research area is exceptionally high. This is corroborated by recent results from the tonofovir trial, which reported an HIV-incidence rate in sexually active women in KwaZulu-Natal of 9.1/100 person-years (placebo group).

Modes of HIV transmission

The South African HIV epidemic is clearly **driven by heterosexual transmission**, which is typical for generalized and hyperendemic epidemics. Research is ongoing on the transmission probability of HIV between heterosexual partners. Two estimations both reported very high estimated per-partnership probability of HIV transmission, nearing 1.0 for young women.

Same-sex transmission between men having sex with men (MSM) has been addressed in research studies in several South African cities. Serological data confirm MSM as a high-risk population. In a survey among young men in the Eastern Cape, men with same-sex experience were 3.6 times more likely to be HIV-positive. There is a high frequency of self-reported unprotected anal intercourse (UAI) and other risk behaviours among MSM, and there is evidence of some serosorting when partners are acquired, namely selection of sexual partners with the same HIV status. Overall, there is evidence that MSM-related HIV transmission contributes to current HIV incidence.

While it seems that South Africa does not have a major **injecting drug use (IDU)** problem at present, it has a large and growing problem with crack cocaine, especially among sex workers (who in turn inject and smoke heroin as a come-down drug for crack cocaine). According to the HSRC 2005 survey, 1.6% of adults said they had injected drugs in the last three months. Only 0.1% of respondents indicated that they had shared injecting needles. In the 2008 International Rapid Assessment and Response Evaluation, HIV prevalence in a small sample of 35 IDUs was 20%, and HIV prevalence was highest among drug-using sex workers (SWs) and MSM. Therefore, IDU seems a minor contributor to current HIV transmission and is interlinked with other risk contexts, namely commercial sex and MSM.

Data on the role of **medical injections and infection control** in health-care settings are limited. The 2005 HIV exposure study among children found that children who had received a medical injection in the past 12 months were slightly more likely to be HIV-positive than those who had not had an injection (difference not significant). Some data are available for single, accidental percutaneous injuries with needles or other sharp objects, commonly involving health-care workers and laboratory workers. Studies in several hospitals reported that unsafe practices are widespread and the methods of reporting blood exposures inadequate. The 2002 health-worker study implemented in several provinces highlighted the need for rigorous infection-control practices to protect both health-care workers and patients from HIV transmission in health-care settings.

Prevention of HIV transmission through **blood and blood products** is under the control of the South African National Blood Service and the Western Province Blood Transfusion Service. Both services have rigorous internal quality assurance measures, and are inspected by the South African Quality Assurance Systems and subjected

to other external quality assurance procedures. All (100%) of donated blood units are screened for HIV-1, HIV-2, hepatitis B and C, and syphilis. Since 2005, all donations are screened for HIV-1, hepatitis B and C using nucleic acid amplification technology. HIV transmission through blood transfusions is probably close to zero, unless there are frequent blood transfusions outside the control of the blood services.

There is a body of evidence from biomedical and sociological research and estimation work on **vertical transmission of HIV** from mother to baby, and the effects of prevention of mother-to-child transmission (PMTCT) interventions. It was estimated that in 2009 about 42 700 new infections would occur in children aged 0–14, mostly through vertical transmission (this represents 11% of all new infections estimated for South Africa in 2009). In the same year, about 214 000 HIV-positive mothers needed PMTCT services, and about 159 000 children aged 0–14 needed antiretroviral treatment (ART). A recent study found that mother-to-child transmission (MTCT) rates were significantly lower in women who became pregnant on ART than in those initiating ART during pregnancy (0.7% vs 5.7%), and that each additional week on ART reduced odds of MTCT by 8%. Vertical transmission can also be reduced by preventing unwanted pregnancies in HIV-positive women. In the 2003 Demographic and Health Survey, 23% of the births in the last five years in South Africa were not wanted at the time they were conceived. The international literature states that preventing unintended pregnancies among HIV-positive women could produce equivalent reductions in infant HIV incidence as ARV prophylaxis during pregnancy.

South African research has also demonstrated the importance of exclusive breastfeeding or safe replacement feeding to reduce the risks of MTCT in infants up to six months of age. However, the proportion of infants exclusively breastfed was low in both the 1998 and the 2003 SADHS (only 8% of infants under six months were reported to have been exclusively breastfed). The 2005 HIV exposure study among children found that wet-nursing was risky for the infant – children who had been breastfed by a non-biological mother were 17 times more likely to be infected with HIV than children without wet-nursing experience.

Factors in the sexual transmission of HIV

Sexual debut: there is a trend towards earlier sexual debut amongst youth – median age at first sex was 20 years for men and women born before 1950 and 18 years for those born in the 1980s. Sex before 15 years of age increased significantly in the Free State, North West province and Mpumalanga between 2002 and 2008. Young black Africans report higher levels of sexual experience than coloured, Indian and white youth. The Cape Area Panel Study found that girls in lower-income households tended to have earlier sexual debut, and that community poverty rates were associated with early sexual debut and higher rates of unprotected sex. In the Africa Centre study area, the most important and highly significant factor protecting females against first sex before their 17th birthday was school attendance.

Secondary abstinence (no sex in last 12 months among those who had ever had sex): nearly one third of adults reported secondary abstinence, and more than one fifth of youth aged 15–24 reported secondary abstinence. The average period of abstinence after childbirth was 8.2 months for black African women, 3.3 months for coloured women and 1.9 months for Indian and white women in 2003.

Multiple sexual partnerships (MSP): the frequency of reported multiple partners varies by race and is highest in black African men. In the NCS 2009, 16.7% of men and 2.3% of women aged 16–55 reported two or more partners (among those who had ever had sex). Multiple partner frequency peaks in people in their twenties, but there may be underreporting in older age groups where marriage is more common. Comparing multiple partner data across the five national surveys, there some indication of an increase over time in the proportion of men aged 16–55 who reported MSP in the past 12 months. HIV prevalence was higher in respondents reporting more sexual partners. Women reporting more than one partner at the time of survey in 2005 were 4.3 times more likely to be HIV-positive ($p = 0.0001$). The sexual concurrency analysis of the NCS 2009 data confirmed the relatively higher concurrency prevalence for black African men compared to coloured, Indian and white men. Sexual relationships are seen as a path to a number of distinct benefits by both females and males.



Acquisition of new partners: overall, the rate of partner acquisition was three times higher in men than in women, and highest in men aged 20–24 (NCS, 2009). The rate was highest among those who have no partner, and those who are in their early twenties. Black African men and women seemed more likely to acquire a new partner than non-black Africans. Men and women living in tribal areas were the least likely to acquire a new partner. People who had an HIV test in the 12 months before the survey had higher acquisition rates in the same period. This is because people who get a new partner might be getting tested as they enter the new relationship; alternatively, people who are aware that new partners present an HIV risk may get tested in response to their exposure.

Condom use: young singles (who are not married or cohabiting) and young people reporting multiple sexual partnerships are most likely to report using condoms. People over the age of 50 and married people are least likely to report condom use. Young females reporting once-off partners also report low condom use. Regarding short-term trends, overall reported condom use significantly increased between 2002 and 2008, but not among people reporting multiple sexual partnerships. PLHIV who knew that they were HIV-positive were significantly more likely to use a condom than PLHIV who did not know their HIV status. Available data indicated that condoms were least likely to be used consistently in partnerships characterised by long-term concurrency. In provinces with higher HIV levels, sexually active women are more likely to choose condoms as contraceptives than in provinces with less HIV.

Increased condom use among the youth may have contributed to the recent decline in HIV incidence in this age group (note that this is self-reported condom use data with known problems of validity).

Prevention knowledge and risk perception: correct knowledge on the prevention of sexual transmission of HIV was lower in 2008 than in 2005 in all age and sex strata except in males aged 50 or above. Correct knowledge on prevention and the rejection of misconceptions about HIV transmission has overall decreased, especially in Limpopo, KwaZulu-Natal, Mpumalanga and the Eastern Cape. A relatively small proportion of the population regard themselves to be at any significant risk for HIV, but significantly more HIV-positive respondents perceived themselves to be at high risk of HIV compared to HIV-negative respondents.

HIV testing behaviour: testing behaviour varies by province, and the three high-prevalence provinces – KwaZulu-Natal, Mpumalanga and the Free State – have comparatively fewer people recently tested for HIV. Among adults, a quarter have had an HIV test and received their results.

Age-disparate sexual relationships: an analysis of the reported age gaps between sexual partners suggests that as men get older, the age gap with their partners gets bigger. The HSRC data show that sexual relationships between young girls aged 15–19 and older men are risky – girls reporting an age-disparate relationship were 72% more likely to be infected with HIV than girls with similar-aged partners (HIV prevalence 29.5% vs 17.2%). In summary, men and women who have partners much younger/older than themselves are more likely to be HIV-positive than people who reported partners of similar age only.

Transactional sex: the exchange of cash, gifts or services for sexual intercourse is closely linked with age-disparate sex. In South African surveys, reported frequencies of transactional sex vary widely; 2–52% of females and 4–30% of males have reported transactional sex experiences. Research in a number of sub-Saharan African contexts has conclusively demonstrated that exchange of sex for material resources is common practice, and that the vast majority of women who engage in such transactions do not see themselves as sex workers. Transactional sex is part of a cluster of closely related violent and controlling practices by men, and may often be motivated by ideas of sexual conquest as much as sexual desire.

Sex work: About 2% of men reported ever having paid for sex in HSRC's 2005 survey. Having had sex with a sex worker (SW) almost tripled men's odds for HIV infection.

Three recent bio-surveys in SWs reported HIV-prevalence levels of around 60%, but infection levels in white and coloured SWs were reported to be much lower, just below 20%. Sex work, alcohol use and consumption of drugs overlap, and SWs work in unsafe and dangerous conditions. They suffer violence from clients, their partners and the police, and have difficulties accessing health, social, police, legal and financial services.

Alcohol use: South African data demonstrate that alcohol consumption is associated with risky sexual behaviour, a higher likelihood of being HIV infected, and poor HIV-prevention behaviours. Findings from the South African Community Epidemiology Network on Drug Use demonstrate that acute alcohol intoxication is associated with increased mortality and morbidity in South Africa due to accidents, violence, unsafe sexual practices and the damaging effects of alcohol to the unborn baby.

Gender roles and norms: traditionally, in many parts of sub-Saharan Africa, women have played a subordinate role in reproductive and sexual decision-making, and culturally based gender norms have rendered women subservient to male partners. In South Africa, the gender hierarchy and dominant constructions of South African masculinities legitimate the control of women. However, gender norms and roles are undergoing change in South Africa, and it has been reported that the gender gap is closing. One consequence of this is that there is "gender role confusion" and couples have to renegotiate gender roles and relations. Ironically, women who break out of the traditional sexual and gender roles can incur increased HIV risks – for instance, women who seek secondary sexual partners as revenge for their primary partner's infidelity.

Violence and rape: South African data suggest a direct link between violence and HIV infection – HIV-positive women are more likely than HIV-negative women to have experienced partner physical abuse. In Soweto, women with violent or controlling male partners were more likely to be HIV-positive, and abusive men were more likely to have HIV and impose risky sexual practices on their partners. In an HIV-negative cohort of young women in the Eastern Cape, relationship power inequity and intimate partner violence (IPV) significantly increased the risk of incident HIV infection (population attributable fractions were 13.9% for relationship power equity and 11.9% for IPV).

Mobility and migration: in South Africa, the risk of HIV infection has been found to be higher among individuals who either have personal migration experience or have sexual partners who are migrants. Since the early stages of the epidemic, infections in rural areas have been traced to those who had been in urban areas, and truckers have been found to be at higher risk because of their greater mobility. In the Africa Centre research area, HIV-prevalence levels have been higher along major roads. It has been stated that oscillating migration – with spouses living apart for extended periods of time – is an essential component for an epidemic as severe as the one witnessed in South Africa.

Social cohesion and social capital: evidence of a possible link between levels of social cohesion or social capital and HIV prevalence comes from two South African studies: the Intervention with Microfinance for AIDS & Gender Equity (IMAGE) study in rural Limpopo, and a study in the Summertown mining community near Johannesburg. The interface between HIV infection and social capital is clearly complex and defies easy generalization. Membership in some types of organizations may be associated with lowered HIV risk (such as sports groups, church organizations, women's organizations).



RECOMMENDATIONS¹

Getting more from the data

1. **Promote data analysis across datasets whenever possible in order to understand changes over time and obtain better estimates around less frequently reported behaviours through data pooling.** This will require more collaboration among research institutions to ensure the same measures can be tracked across surveys and that the survey protocols are harmonized to the greatest extent possible. People involved in the analysis must be involved in questionnaire and survey design from the start. The sharing of databases would encourage better data management and permit some useful analysis.
2. **Strengthen programming, data management and analysis capacity in the main research and survey institutions to be able to address the increasingly complex data analysis and modelling challenges.** The goal of such capacity strengthening would be to have a core group of programmers and statisticians with the skills needed for complex data analyses and modelling as well as technical exchange. There is already specialist analytical capacity and skill in a few institutions in South Africa, but this is not sufficient for the amount of population-level data collected. Datasets are frequently not fully analysed due to limited human resources and capacity. This "Know Your Epidemic" (KYE) analysis calculated for the first time sexual concurrency rates and partner acquisition rates for South Africa from available national survey data.
3. **Establish a knowledge hub which centralises, stores and archives HIV survey and research study protocols, the actual databases and reports and publications.** The aim is to make HIV research and survey data and information accessible in one central repository. This study showed that data are scattered and although some institutions have searchable lists of their own publications (e.g. Medical Research Council, HSRC, Africa Centre), survey protocols, grey literature and databases often are not accessible or shared, and there is no centralization in one hub.

Improving data quality

1. **Reinforce communication campaigns prior to surveys with the aim of high participation rates in all race groups.** The cited reasons among whites, Indians and coloureds for non-participation in the surveys must be taken seriously and specific solutions found which increase the trust of sampled individuals and the perception that HIV concerns all South Africans. Even if sophisticated data analysis methods are used to allow for non-participation, as done in this KYE study, biases arising through systematic differences in participation cannot be ruled out.
2. **Further strengthen the methodological work on the measurement and estimation of HIV incidence.** The aim is to improve the understanding of each method of incidence measurement and its relative performance compared to other methods, and to agree on the best method to track national HIV incidence. This KYE process with its HIV incidence workshop showed that South Africa is already leading in this methodological work but that there is still no consensus on how to track the main indicator in the NSP on HIV prevention, namely national HIV incidence.

1. Recommendations based on these HIV epidemic review findings; more programmatic and policy recommendations are made in the full KYE/KYR national synthesis report.

3. **Support research into the methodologies of behavioural surveys in order to broaden the spectrum of available measuring tools and to deepen the understanding of the validity of responses obtained from survey/study participants.** The overall aim would be to improve the research tools – both quantitative and qualitative – for behavioural surveys and studies. This KYE analysis demonstrated that unless data with better validity can be obtained, it is difficult to understand people’s behaviours and practices in their sexual lives. Any research results need to be communicated effectively to other research institutions working in the country in order to impact the quality and validity of behavioural research results in South Africa.

Acting on the data

1. **Aim to understand better the prevention behaviours of different categories of PLHIV** (those on ART, those in the pre-ART cohort, those who know they are HIV-positive but are well, those who are unaware that they are HIV-positive, as well as children living with HIV). This KYE analysis summarized the available evidence; findings like the one on significantly higher condom use by PLHIV if they know that they are HIV-positive are crucial and supportive of HIV-testing campaigns. Findings of high rates of unprotected sex in pre-ART patients is alarming and points to a lack of communication and counselling activities with these patients. In order to make “Prevention for Positives” activities work in a context of fast-growing PLHIV numbers, prevention behaviours in the different categories of PLHIV must be understood better.
2. **Strengthen research on vertical transmission and monitoring and evaluation of PMTCT interventions.** The overall aim would be to understand better the factors leading to HIV transmission in pregnancy and how the PMTCT programme impacts HIV transmission. Specific areas of focus would be the use and non-use of family-planning services by HIV-positive couples (many pregnancies in HIV-positive couples are unwanted), the prevention and sexual behaviours of HIV-positive couples during pregnancy (generally, pregnant women and their partners have an increased chance of HIV acquisition during pregnancy), the use of PMTCT services (testing as a couple, re-testing in late pregnancy, etc.). Apart from such research studies, routine PMTCT monitoring also needs improvements.
3. **Strengthen the legal and policy context for interventions for female and male sex workers (SWs).** The overall aim would be to decriminalise sex work and move towards the protection of male and female SWs. The KYE study showed the deficiencies in addressing sex work in South Africa, and the problems with violence, discrimination and stigma of SWs, who are sometimes even attacked by police officers instead of protected. Making sex work safer requires policy provision and may entail medical follow-up and issuing permits for SWs. In addition, a concerted programme focus is required on sex work in urban hotspots.
4. **Explore possibilities of interventions to promote earlier marriage.** The objective would be to stop and reverse the trend of late marriage in South Africa, which undoubtedly contributes to the HIV epidemic. This analysis summarized the evidence on the extended periods of sexual activity with different partners where there is no marital commitment and where people compete for partnering with those few who have a good income. The **lobola** payment for marriage is a major contributor to late marriage. Possible structural interventions could be policy provisions on preferential access to housing and work programmes for married people.

