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Foreword

We at the Nelson Mandela Foundation and the Nelson Mandela Children's Fund identified the need for a national HIV/AIDS survey after realising that one of the major constraints we face in dealing with the epidemic is our lack of information in a changing environment.

We have to manage the disease, or the disease will manage us. The key ingredient to managing the disease successfully is current and accurate information covering the full cultural and demographic spectrum of South Africa.

Consequently, we joined hands with the Human Sciences Research Council to undertake the first national community-based study on behavioural and socio-cultural determinants contributing to vulnerability to HIV/AIDS as well as the testing of HIV antibodies in individuals. The study also focused on the impact of the mass media on knowledge, attitudes and prevention.

It forms part of the Nelson Mandela Foundation's HIV/AIDS strategy for care and destigmatisation.

I would like to thank all the individuals who gave up their time to provide us with the necessary information as well as the researchers for undertaking this massive task, and the fieldworkers for collecting the information. Without their tireless commitment this study would not have been successful.

The information gained marks a watershed in our fight against HIV/AIDS – to effectively contain the spread of the disease, care for those afflicted and ameliorate the impact of this epidemic. I am proud to say we now have the data to tackle the epidemic more vigorously.

Nelson R. Mandela
December 2002

Preface

In the last decade in South Africa, the number of deaths from AIDS *each year* has risen to hundreds of thousands. The burden of care and loss falls hardest upon the poor, making the development challenges of our nation difficult and costly.

In this context, the pioneering study presented in this report – the first systematically sampled, nationwide community-based survey of the prevalence of HIV in South Africa – assumes great importance.

Its findings open three windows of opportunity for concerted interventions in South Africa. Firstly, we now have information for different race, gender and age groups in urban and rural areas, thus allowing programme planners to develop targeted interventions. Secondly, we have a clearer understanding of the positive relationship between communication and risk reduction, as well as of information needs. Thirdly, because the findings are representative, they will enable reliable modelling for the first time, giving a solid basis for optimising and extending programmes of prevention, care, treatment and support.

It is essential that the impact of these efforts be monitored as they unfold. The HSRC is committed to repeating this study at regular intervals.

We are deeply grateful to the Nelson Mandela Foundation and the Nelson Mandela Children's Fund for championing and helping to fund the project as well as to our other donor, the Swiss Development Co-operation and to the many partners acknowledged elsewhere. We salute Dr Olive Shisana and her research team for their mighty effort. Millions of people depend upon the translation of these findings into policies and programmes that will meet the very real needs in this country.

Dr F.M. Orkin
CEO: Human Sciences Research Council
December 2002

Acknowledgements

This research study was a collaborative endeavour involving many people from beginning to end. Although not an exhaustive list, we wish to thank the following people and organisations for their participation in one way or another in this study.

- The friendly people of South Africa without whose generosity, this survey would not have been possible. In particular, we wish to thank the families in all corners of the country for letting us intrude into their homes and their private lives by participating in this study. Their participation is a testimony that if we all pull our energies together we can provide information necessary to tackle the epidemic that confronts us all.

- The participants who attended the planning meeting organised by the Nelson Mandela Foundation and the Nelson Mandela Children's Fund that led to the conception of this study. This meeting included those involved in mass media on HIV/AIDS, non-governmental organisations dealing with HIV/AIDS, the Department of Health, and the Department of Social Development, and other research organisations, notably the Medical Research Council.

- The members of the Steering Committee and the HSRC Technical Team who guided the project especially during its formative stages.

- The members of staff of various research programmes in the HSRC including Social Aspects of HIV/AIDS and Health (SAHA), Child, Youth and Family Development (CYFD), and Surveys, Analyses, Modelling & Mapping (SAMM). In particular, we wish to thank Ms Efua Dorkenoo, OBE of SAHA for her assistance during the early stages of the study; Prof Linda Richter, the Executive Director of CYFD and her colleague Dr Heather Brookes for their contribution to conceptualisation of the child methodology component of the study as well as editorial assistance; Dr Udesh Pillay, the Executive Director and Mr Craig Schwabe, the Director of GIS, both of SAMM, for their assistance with the creation of the Master Sample; Mr Johan van Zyl of Integrated Rural and Regional Development (IRRD) for sharing his enormous experience in surveys especially on questionnaire design and executing fieldwork, and finally, but not least, Mrs Monica Peret for leading the team who did the day-to-day data management for this study.

- Geospace International for implementing the Master Sample and providing the technical team, which included 15 surveyors used during Phase I of this study, and Mr Francois Bezuidenhout and Mr Thabo Phalatse during both phases of this study.

- Prof David Stoker, the statistical consultant. His expertise proved most invaluable at all stages of the study, especially in designing the master sample.

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- The MRC team led by Dr Mark Colvin who helped with their expertise on HIV testing and epidemiology.

- The CADRE team led by Mr Warren Parker and Dr Kevin Kelly who contributed their expertise in mass media and HIV/AIDS communication.

- Ms Jeanette Bloem, a consultant from Family Health International with extensive experience in conducting behavioural surveys in various African countries, for helping us as the Fieldwork Supervisor.

- Dr Sue Laver, a consultant from Family Health International, for providing a possible framework for data analysis.

- Dr Thomas Rehle, previously with Family Health International, for reviewing the final report for technical soundness.

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- The Ministry of Social Development, whose staff contributed to reviewing the report and identifying areas necessary for policy and planning.

- The field workers and supervisors for both Phases 1 and 2 of the study, the community-entry facilitators, the coding assistants and the data capturers.

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In addition to the above, we would also like to make special thanks to the following people and organisations that funded or supported this study:

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- Mr Nelson Mandela for his encouragement to undertake research to inform public campaigns aimed at preventing HIV/AIDS, to help care for those afflicted and mitigate the impact of this epidemic.

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Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
ANRS	Agence National de Recherche sur la Sida
ARV	Anti-retroviral
CADRE	Centre for Development, Research and Evaluation
CI	Confidence interval
CLS	Contract Laboratory Services
CYFD	Child, Youth and Family Development
DEFF	Design effect
DU	Dwelling unit
EA	Enumerator area
EC	Eastern Cape Province
ETAPSUD	Programme on Evaluation of access to HIV care in developing countries
FHI	Family Health International
FS	Free State Province
GIS	Geographical Information System
GP	Gauteng Province
GPS	Global Positioning System
HIV	Human Immunodeficiency Virus
HSRC	Human Sciences Research Council
KZN	KwaZulu-Natal Province
LP	Limpopo Province
MEDUNSA	Medical University of South Africa
MOS	Measure of size
MP	Mpumalanga Province
MRC	Medical Research Council
MS	Master sample
NGO	Non-governmental organistion
NC	Northern Cape Province
NCMF	The Nelson Mandela Children's Fund
NMF	The Nelson Mandela Foundation
NS	Not significant
NW	North West Province
OVC	Orphans and vunerable children
PLWA	People living with HIV/AIDS
PMTCT	Preventing mother to child transmission
PSU	Primary Sampling Unit
QC	Quality control
SA	South Africa
SAHA	Social Aspects of HIV/AIDS and Health
SAMM	Surveys, Analyses, Modelling & Mapping
SAS	Survey Analysis Software
SD	Standard deviation
SSU	Secondary sampling unit
Stats SA	Statistics South Africa
STI	Sexually transmitted infection
UNAID	Joint United Nations Programme on HIV/AIDS
USAIDS	United States Agency for International Development
USU	Ultimate sampling unit
VCT	Voluntary counselling and testing
VP	Visiting point
VPQ	Visiting point questionnaire
WC	Western Cape Province
WHO	World Health Organisation

1. Introduction

1.1 HIV/AIDS in South Africa

Over 20 years ago Acquired Immune Deficiency Syndrome (AIDS) was first documented and more than 15 years ago HIV was first identified as a causative agent for AIDS. Since then, the epidemic has spread throughout the world, but at an uneven pace. It is estimated that more than 60 million people worldwide have lived with HIV/AIDS since the beginning of the epidemic and 20 million of these have died (UNAIDS 2002). HIV/AIDS now affects every country in the world. Despite advances made in knowledge about HIV prevention, the disease continues to spread. Globally, sub-Saharan Africa is the most severely affected, with the Southern African Development Community (SADC) being home to half of the estimated 24 million people living with HIV/AIDS in this region (UNAIDS 2000).

Country level estimates of HIV infection are usually based on surveys of women attending antenatal clinics. In South Africa over the past decade, this has been the primary means of monitoring the spread of HIV. Antenatal surveillance systems provide countries with a low-cost tool for regularly monitoring key aspects of the HIV epidemic. For example, the data can be used to track the epidemic in different parts of a country or among a specific age cohort. The antenatal survey's major usefulness is to track trends of HIV infections over time.

The antenatal survey does however have limitations for estimating national prevalence levels in the general population for several reasons. Firstly, only a select group (i.e., currently or recently sexually-active women, who are pregnant and thus of a limited age group 15–49) are included in the surveys. Secondly, because a sexually active group is being sampled, it is difficult to draw conclusions about proportions of the population who are not sexually active, particularly younger age groups where sexual debut may not yet have occurred. Thirdly, individuals who have adopted key HIV prevention practices such as condom use are considerably less likely to be represented in the antenatal sample. These factors may contribute to antenatal surveys over-estimating HIV prevalence. On the other hand, under-estimation might also occur. For example, studies have shown that HIV lowers fertility.

In order to get a deeper understanding of HIV/AIDS, UNAIDS/WHO recommend the establishment of the second-generation HIV surveillance system (Department of Health, 1998a; FHI 2002). The approach combines behavioural risk and HIV prevalence surveys and has been endorsed by the South African Department of Health (2002b).

In South Africa several population-based surveys have been conducted on sub-national samples (Auvert et al. 2001; Colvin et al. 1998; MacPhail et al. 2002), and this present study represents the first national level survey.

1.2 Social and behavioural determinants of HIV

1.2.1 Population-based national studies in South Africa

Only a few large-scale population-based national studies have been carried out in South Africa to explore *behavioural and social determinants* of HIV/AIDS. These are the *South*

African Health Inequalities Survey (SAHIS 1994), the *South African Demographic and Health Survey* (SADHS) (Department of Health 1998b), and the *Human Sciences Research Council's (HSRC) surveys* (1997, 1999, 2001).

The SAHIS was a household survey of randomly selected, nationally sampled people aged between 16 and 64 years. The sample comprised 3 796 people, the overwhelming majority of whom were women. This first survey dating back to 1994 suggested quite a high level of awareness among respondents of the rapid spread of HIV and of the major modes of transmission of the virus, including transmission through unprotected sexual intercourse.

The SADHS was based on a national, two-stage sample selected from the 1996 census data. It included 13 827 adult respondents aged 15 years and older, of whom 11 735 were women aged 15–49. It included sections on awareness and knowledge of HIV/AIDS, sexual partners and condom use. Although general knowledge about HIV was high, there were also a number of myths and/or misperceptions held. Among teenage women, 95% knew about AIDS but more than half did not know that a healthy-looking person could be HIV infected. While 40% reported that they had no sexual partner during the previous year, very few women interviewed (2.9%) reported having had two or more sexual partners in the 12 months preceding the survey. Of the sexually active women, 22% had ever used a condom and only 8% had used a condom at last sex. Condom use was considerably higher for sexual encounters with non-marital partners: 21.2% among women under 20 years of age, 20.3% for urban women, 20.2% for women with Matric, 26.9% in Free State followed by 22.1% in Gauteng. Younger women and women living in urban areas were more likely to use condoms than older and rural women.

The HSRC regularly conducts national opinion surveys to examine the perspectives of South Africans on a variety of issues. In 1999, at the time of the November opinion survey, the Integrated Marketing Information Group (IMIG) worked with the HSRC in conducting the Mindset Survey that included measures of condom use, and HIV-related personal risk behaviours. A national sample of 2 704 was selected and interviewed. The results are briefly summarised in the table below.

The population studies mentioned above have been criticised for not being sufficiently representative and therefore of limited use to public health specialists and policy makers. Indeed, the accuracy of the samples that were surveyed is uncertain. None of these surveys attempted to investigate in depth the social, economic and cultural determinants of HIV-related risk behaviours, as had been the case in many surveys about Knowledge-Attitudes-Beliefs and Practices and Partner Relationships (KABP-PR) in other countries. More importantly, data collection in these surveys was limited to respondents' opinions and/or self-declarations about individual attitudes and behaviours and did not include any HIV testing. Therefore, the relationship between behaviours and HIV serostatus could not be examined. Due to these limitations of previous studies in South Africa, there was a clear need for a population-based survey with a representative national sample to provide more accurate HIV-related sexual behaviour risk profiles upon which interventions can be based and hence the present study.

Table 1: A summary of findings from the HSRC and Integrated Marketing Information Group's (1999) public opinion survey regarding some HIV-related behaviours (people agreeing) (n=2,704)

AIDS ISSUES	Total	GP	KZN	EC	WC	LP	NW	MP	FS	NC
Total (%)	**100**	**21**	**19**	**14**	**11**	**10**	**9**	7	7	**2**
AIDS ads made me think, change (%)	**67**	60	70	73	58	73	68	69	69	65
Use condoms because of AIDS (%)	**44**	45	40	43	25	60	54	48	52	37
People like me not at risk (%)	**45**	50	49	41	31	50	41	48	48	46
AIDS encourages use of condoms (%)	**69**	65	67	77	67	76	72	72	66	63

Source: IMIG (1999)

1.2.2 Community-based behavioural studies carried out in South Africa

Many small-scale studies using non-representative samples or focusing on sub-populations such as youth, commercial sex workers, prisoners and truck drivers or on specific geographic regions have been conducted in South Africa. The results from this body of literature were helpful in designing the present survey and in informing interpretation of results. More extensive reviews of this behavioural research literature have been conducted elsewhere (Attawell 1998; Kelly et al. 2001). Some of the main findings of these surveys are summarised below.

Unsafe sex behaviours

A range of HIV risk behaviours have been identified in South Africa including unprotected sex with multiple partners (eg. Caldwell et al. 1994; Hope 1999; although see Mufune 1999), poor and inconsistent male condom usage (eg. Peltzer 2000; Reddy et al. 2000), dry sex (eg. Louria et al. 2000; Morris & Williamson 2001), anal sex (eg. Abdool Karim & Ramgee 1998; Halperin 1999), and sex while infected with sexually transmitted infections (eg. Reddy et al. 2000; Simbayi et al. 1999).

Stigma, denial, exclusion and discrimination

People living with HIV/AIDS, especially women, have been found to be exposed to stigma and discrimination at community and family level, (Achmat 2001; Johnston 2001; Qwana et al. 2001; WHO/UNAIDS 2000) as well as by health personnel (Fransman et al. 2000).

Gender-related issues

The factors that are known to increase the risks of HIV infection among females in South Africa include the low social status of women and economic dependence on men (Grieser et al. 2001; Matchaba 2000; Mitton 2000). These factors affect women's capacity

to determine their sexual lives (Meyer-Weitz et al. 1998; Strebel 1995; WHO 1993), with sexual decision-making being constrained by coercion and violence (HIV InSite, 2001; WHO/UNAIDS, 2000). Economic constraints may lead to prostitution or sex work (Abdool Karim 1998; Matchaba 2000; Mitton 2000; Schoofs 1999a) and age differentials amongst sexual partners (HIV InSite 2001; Kelly 2000; Shell & Zeitlin 2000).

Migration
Migration is a risk factor for HIV and other STIs because migrants are more likely than non-migrants to have additional partners (Lurie 2000; Lurie et al. 1997; Okee-Obeng 2001; Schoofs 1999b). Labour migration patterns in Southern Africa (both intra- and inter-country) have been widely documented, showing regular relocation for work amongst mostly unskilled African workers. Political instability of the Southern African countries during the late eighties and early nineties contributed to both economic and politically motivated migration, which increased vulnerability of those affected.

The military
According to Okee-Obeng (2001) and Beresford (2001) there is an association between work in the military and high-risk sexual activity.

Poverty
It is widely acknowledged that poverty plays a pivotal role in increasing vulnerability to HIV infection in sub-Saharan African countries including South Africa (Colvin 2000; Mitton 2000; although see Halperin & Allen 2001; Mufune 1999).

Incarceration in overcrowded prisons
In prisons, the cramped single-sex living conditions as well as prolonged periods of being locked up in overcrowded cells promote casual or forced sexual relationships, mostly involving anal sex (Kola et al. 1997; Halperin 1999). Sex is exchanged for commodities or physical protection, and incarcerated adolescents, for example, report sexual intercourse with multiple sexual partners, rape, gang rape, and inconsistent condom use.

Male circumcision
Male circumcision is practised in various forms among some groups in South Africa (Dreyer 1999; Van Vuuren & De Jongh 1996). For example, male circumcision is carried out among newly born Jewish and Muslim babies and also among youth who have reached puberty in African cultural groups such as the Xhosa, Ndebele, Pedi, South Sotho and Venda. While Jewish circumcisions mostly occur under clinical conditions provided for by western medical settings, those carried out among African cultural groups have been noted to occur in unsterile conditions, and may also include repeated use of the same instrument, which poses a risk of HIV infection. In some contexts, circumcised males may be encouraged to engage in pre-marital sex with women they do not intend to marry. Research into the influence of male circumcision on the spread of HIV infection has suggested that the practice protects people from HIV infection, (Krantz & Ahlberg 1995; O'Farrell & Egger 2000; Van Howe 1999; although see Seed et al. 1995; Weiss et al. 2000 who suggest otherwise).

Female circumcision and/or initiation
There is no evidence of clitoridectomy among the various cultural groups in South Africa, although it could be taking place among some Muslim communities (as practised in other

Muslim countries throughout the world). In contrast, there are other non-invasive initiation ceremonies practised by many indigenous African cultures, especially soon after menarche, which include, inter alia, the provision of sex education followed by simulated bestiality, sex games between adolescent boys and girls or actual penetrative vaginal sex with infertile men. In some societies in South Africa, the clitoris and/or labia are stretched to make them longer. This is purported to bring more pleasure to male sexual partners during sexual intercourse. The relationship of such practices to risk of HIV transmission needs further investigation.

Rites of marriage
Several pre-marital and marital practices found amongst some indigenous cultures in South Africa include pre-marital sex, virginity testing which may lead to unprotected anal sex (Halperin 1999), fertility and virility testing, early or arranged marriages, pre-marital sex with in-law or parents before sleeping with own new spouse, fertility obligations, approved extramarital relations, having a bonus wife, polygamy especially among the Zulu, Swati and Shangaan in South Africa and polygamy in some rural communities due to migratory labour practices (see Schoofs 1999b), prohibition of post-partum sex and also sex during breastfeeding.

Rites of death
Practices which occur amongst some cultural groups include: (a) levirate whereby when one of the two partners in a marriage dies, a brother or sister of the dead partner inherits the remaining spouse, and (b) sororate whereby a widower or sometimes a husband of a barren woman marries his wife's sister in order to ensure that the relationship developed between the two families produces some offspring and hence does not dissolve.

Indigenous healing practices
Some indigenous healing practices may contribute to the spread of HIV infection in Southern African countries. Some indigenous healers use unsterilised sharp instruments such as knives, blades, spears, animal horns and thorns during healing practices. Some have also been reported to have sex with their clients or recommend that their clients should have sex with virgins as part of treatments. However, they may also contribute to containing the spread of HIV, especially where the healers are involved in educating their patients about HIV prevention.

1.2.3 International studies on behavioural risks

There is a large body of social and epidemiological research into behavioural factors influencing HIV infection internationally (see UNAIDS 2002). Table 2 provides an example of some key behavioural indicators in countries both inside and outside Africa that are noted for their successes in fighting HIV/AIDS in recent years. Overall, sexual behavioural risks vary considerably from country to country irrespective of the stage of the HIV/AIDS epidemic.

A recent multi-site and multi-country study that was conducted in Africa amongst 2 116 participants from four urban communities in Benin, Cameroon, Kenya and Zambia found that overall reported condom use was low, with proportions of men and women who reported frequent condom use with all non-spousal partners being 21–25% for men and 11–24% for women in the four cities studied (Lagarde et al. 2001). More importantly, the

Table 2: HIV prevalence, knowledge and behavioural indicators by sex in selected countries

COUNTRY	ADULTS (15-49) HIV prevalence (%)	YOUTH (15-24) Don't know that healthy-looking person can be infected with HIV (%)	YOUTH (15-24) Reported condom use at last high-risk sex (%)		YOUTH (20-24) Median age at first sex	
		Female	Male	Female	Male	Female
Brazil	0.7	21.0	56.0	30.3	**	18.7
Cambodia	2.7	36.7	**	0.5	**	**
Thailand	1.8	**	44.4	**	**	**
Senegal	0.5	55.1	67.0	45.0	**	19.3
Uganda	5.0	24.5	58.9	37.8	19.4	16.7
Zambia	21.5	25.3	30.1	17.6	16 .0	16.6

Source: UNAIDS (2002). Report on the global HIV/AIDS epidemic

proportion of men reporting genital pain or discharge during the past 12 months (i.e. STI infection) was significantly lower among those reporting frequent condom use. The study also found that the median ages of sexual debut for males and females in the four countries were: 19 years of age (both sexes) in Cotonou, Benin, 17.8 (males) and 17.7 (females) in Yaounde, Cameroon, 16.9 (males) and 16.5 (females) in Kisumu, Kenya, and 18.3 (males) and 17.6 (females) in Ndola, Zambia (Ferry et al. 2001).

1.3 HIV/AIDS mass media and communication

Information provision is widely recognised as an important cornerstone of HIV prevention, care and support. HIV/AIDS communication has been integrated into response systems worldwide and has included mass media approaches as well as a variety of interventions involving health and social welfare systems, but also driven by and located within directly affected communities. Particular frameworks and theories typically underpin communication approaches to HIV/AIDS, implicitly or explicitly. These include a focus on individuals (for example, the health belief model; learning theory; the theory of reasoned action; stages of change model and risk reduction model); social theories (for example, diffusion of innovations; social influence models; social networks models, and theories of gender and power); structural and environmental models (for example, individual/social empowerment models; socio-economic frameworks); and trans-theoretical models. There has also been a resurgence of 'common-sense' frameworks that can be located within propagandist approaches, which are oriented towards particularly narrow forms of psychosocial and behavioural modelling.

By and large, the emphasis has been on linear and rationalist psychosocial theories emphasising behavioural risk reduction focusing on the individual. Many of these theories

focus on the relationship between knowledge, attitudes, beliefs and practices and the notion of existing 'high risk' behaviour. There is a strong reliance on the individual as the unit of intervention and analysis. The assumption that individuals have volitional control over the complexities of their sexual behaviour and that such decision-making is grounded in rational imperatives, with lesser emphasis on context, is especially problematic (Melkote et al. 2000).

There is wide acknowledgement that the contexts of HIV/AIDS in Africa, Asia and Latin America present complex challenges, and attention has been drawn to the limiting and mediating effects of under-resourced environments. Also, there is a need to accept that individual change is closely related to social change, and that an understanding of social and environmental contexts needs to be incorporated into behavioural interventions. Furthermore, it is necessary to locate interventions within the domain of cultural aspects of societies, communities, groups and family units (UNAIDS/Penn State, 1999).

With regard to behavioural interventions, there is concern about generalising of assumptions of risk, and homogenising of target audiences. Behaviour change approaches driven by high intensity mass media interventions that involve homogenising target audiences, seldom take into account differences in language, culture and socio-economic contexts. In addition, such approaches tend to be strongly oriented towards persuasive communication messaging, often under the banner of 'behaviour change', and make little allowance for the endorsement of already appropriate behaviours and practices. Messaging may also only resonate with a small sub-section of the intended target audience.

In generalised epidemics where risk of infection is relative, and 'target' audiences are heterogeneous (e.g. youth, economically disadvantaged women) there are complex factors at play. These include variables such as culture, gender disempowerment, sexual coercion, rape, child abuse, violence, poverty, economic necessity (e.g. transactional sex), migration, disability (e.g. visual and aural impairment), language, illiteracy, limited access to preventive resources (e.g. condoms, counselling, STD treatment, HIV testing), health system inefficiencies, lack of appropriate criminal justice and rights frameworks, amongst others.

1.3.1 HIV/AIDS mass media and the communication environment in South Africa

South Africa has a highly developed mass media communications infrastructure. There are five open broadcast commercial television stations – SABC 1/2/3, E-TV and BOP TV – as well as two subscription-based services – M-Net and DSTV – with the latter providing access to some 50 stations via satellite. There are 38 commercial radio stations, with the widest reach being via the African language services of the SABC. There are also 70 community radio stations registered with the National Community Radio Forum (NCRF), although levels of operation vary and some stations are still under development.[1] There are 16 daily commercial newspapers, one bi-weekly, 25 weekly newspapers, and a number of smaller circulation titles. Broadcast media provide for communication in all South African languages, although English dominates television broadcasts. Daily and weekly newspapers are predominantly English, with a few titles in Afrikaans, and other African languages.

1 www.ncrf.co.za

In general, South African HIV/AIDS campaigns have placed a strong emphasis on sexual risk and on youth, with less emphasis on aspects of sexual behaviour such as abstinence. Very little attention has been paid to non-sexual aspects of HIV response, such as care provision and stigma reduction or social mobilisation. Mass media have rarely been used to target other specific sectors or groups, including truckers, sex workers, health workers, faith-based organisations or community leaders.

Table 3:An overview of the HIV/AIDS communication environment in South Africa

ACTIVITY	PRIMARY MEDIUMS	EXAMPLES
Purposive mass media	Television, radio, print (newspapers, magazines), outdoor (billboards, mobile media – eg. buses, taxis, trains)	• Short duration advertisements or inserts, once-off programmes, talk-shows, drama series, documentary series in broadcast media • Advertisements, news and feature articles, regular columns, supplements in print media • Public relations activities and events linked to mass media dissemination • Outdoor advertisements
Non-purposive mass media	Television, radio, print (newspapers, magazines)	AIDS content within: • News programmes • Once-off programmes, talk-shows, drama series, documentary series • News and feature articles, regular columns, editorials and letters
Purposive small media	Leaflets, posters, booklets, brochures, manuals, videos, exhibitions, murals, signs, utility items	Typically print materials, but can extend to other approaches. Utility items include caps, T-shirts and badges/pins
Events	Community gatherings, sports and entertainment events	Events such as World AIDS Day, but also integration of HIV/AIDS into various socio-cultural events
Dialogue and direct experience	Purposive support systems; health systems; religious and cultural systems; sexuality, gender; legal and rights framework; direct experience of HIV/AIDS; HIV/AIDS-related dialogue	Can include structured and purposive dialogue – eg. telephone helplines, lifeskills programmes, counselling; knowing one is HIV positive; knowing persons with HIV/AIDS; experience of legal and rights systems; interaction with resource and service-provision systems; cultural practices; religious beliefs; arguments and conversations
Social action	Involvement in HIV/AIDS activities	Can include attending meetings, working within organisations, attending educational events, giving advice, caring for ill persons or orphans

Table 3 provides an overview of the HIV/AIDS communication environment in South Africa, and informs an understanding of the relationship between purposive HIV/AIDS campaigns and the more general HIV/AIDS communication context.

Differences exist between communication approaches driven by mass media (e.g. broadcast, print, outdoor), small media (e.g. posters, leaflets, booklets, utility items), folk media (e.g. songs, drama, events), dialogue-oriented approaches (e.g. helplines, health services, participatory theatre) and social networking (dialogue at peer and community level). Many campaigns – including campaigns at national, provincial and local levels – have included approaches that work across the domains listed in the table above. For example, utilising mass media approaches in combination with media advocacy directed at news media, as well as small media, event-based approaches, and engagement with socio-cultural systems.

Mass media communication is constrained by a unidirectional approach to messaging and there is little opportunity for audience feedback. In contrast, small media can play a facilitating role as a communication resource, whilst folk media and dialogue-oriented approaches specifically foster two-way communication. Whilst it is argued that mass communication approaches stimulate dialogue, and that the provision of information and issues raised contributes to this, it does not necessarily follow that such responses specifically bring about behavioural or social change.

Key questions about the impact and relative benefit of various media and communication interventions for HIV prevention remain unresolved in the international literature as well as in the specific context of South Africa.

1.4 Rationale and aims of this study

Accurate information on national prevalence, improved understanding of the socio-cultural context in which the epidemic occurs, and the relative impact of interventions, are key to mounting an effective response to the epidemic. Cognisant of this, the Nelson Mandela Children's Fund (NMCF) and Nelson Mandela Foundation (NMF) commissioned the Human Sciences Research Council to conduct a study to:

- Identify prevalent risk factors that predispose South Africans to HIV infections;
- Determine HIV prevalence in the population of South Africa using linked anonymous HIV saliva tests;
- Link the risk factors with biological measures to determine the association between the two;
- Model the prevalence data and forecast probable infection levels for the next ten years (this objective will be reported separately at a later date);
- Identify the social, economic, political, structural and cultural contexts within which behaviour occurs, obstacles to risk reduction, and whether current mass media educational efforts take these factors into account;
- Determine the extent to which current prevention, education and awareness programmes and campaigns reach all sectors of South African society, including the most vulnerable sectors of the population;
- Determine whether media messages are being understood and accepted in the population, and by whom.

This first South African national household HIV/AIDS prevalence study was conducted in collaboration with the MRC and CADRE as the main research partners. The HSRC also invited researchers from the French Agency for AIDS Research (ANRS) to help with analysis of the data. This report provides a preliminary overview of the key findings. It is anticipated that this initial report will be followed by further in-depth analyses of the data over the coming year.

1.5 Conceptual framework

The conceptual framework that informs this study is the second-generation surveillance system, designed by the World Health Organization, UNAIDS and Family Health International. This framework is based on surveys of 'Knowledge-Attitudes-Beliefs and Practices' in relation to sexual behaviours and HIV infection that have been carried out worldwide during the past 15 years.

The study uses this conceptual framework to:

- Collect and analyse behavioural information to determine who is at risk of getting infected, and which behaviours need to be modified, and can thus form the basis for designing interventions to prevent new infections;
- Generate data to track changes in sexual behaviour over time in the South African population, among different age, sex and race groups as well as by provinces for the purpose of monitoring the HIV/AIDS epidemic;
- Obtain behavioural data necessary for explaining change in HIV prevalence in South Africa among different groups; and
- Track knowledge, attitudes and practices related to HIV/AIDS.

To accomplish the goal of improving HIV prevention programmes, it is critical to understand the context within which HIV-related risk behaviours occur. The context influences whether knowledge and information about HIV may lead to behaviour change. Where national leaders show commitment to HIV prevention and care, they allocate resources that make it possible for people to obtain, for example, condoms, treatment for sexually transmitted infections and voluntary counselling and testing services. Knowledge, information and practical skills gained do not necessarily translate into behaviour change if these concrete prevention commodities and/or services are not within reach of those who intend to change their behaviour. Contexts do not always provide protective environments or resources. They may also be harmful. For example, some of the messages may lead to detrimental behaviour. One needs systematically to identify those contexts that are positive as well as those that are negative, with a view to informing programme development.

2. Methodology

In this section we describe the study sample, sampling, weighting of the sample, questionnaire development, training of fieldworkers, compensation for participation, pilot study, data collection methods, data management, and strengths and limitations of the study.

2.1 Study sample

Overall, a total of 14 450 potential participants composed of 4 001 children, 3 720 youths and 6 729 adults were selected for the survey and 13 518 (93.6%) were actually visited. A small proportion (6.4%) of potential respondents could not be approached due to logistic constraints that were unavoidable in a study of such magnitude. More details regarding the sample are provided in Appendices A1-3.

Among the 13 518 individuals who were selected and contacted for the survey, 9 963 (73.7%) persons agreed to be interviewed, and 8 840 (65.4%) agreed to also give a specimen for an HIV test. Thus 88.7% of those who agreed to be interviewed also gave a specimen for testing.

The sample was designed to report the results at provincial level, by geographic location and by race of the respondents. The total sample size was limited by financial constraints, but based on other HSRC experience in sample surveys it was decided to aim at obtaining a minimum of 1 200 households per race group. In fact, the aim was to obtain 1 200 Indian households, 1 800 coloured households, 2 200 white households and 4 800 African households, a total thus of 10 000 households. The number of respondents per household for the study was expected to vary between one and three (one respondent in each of the three age groups). A 70% response rate was assumed and a HIV+ prevalence of 20%.

2.2 Sampling

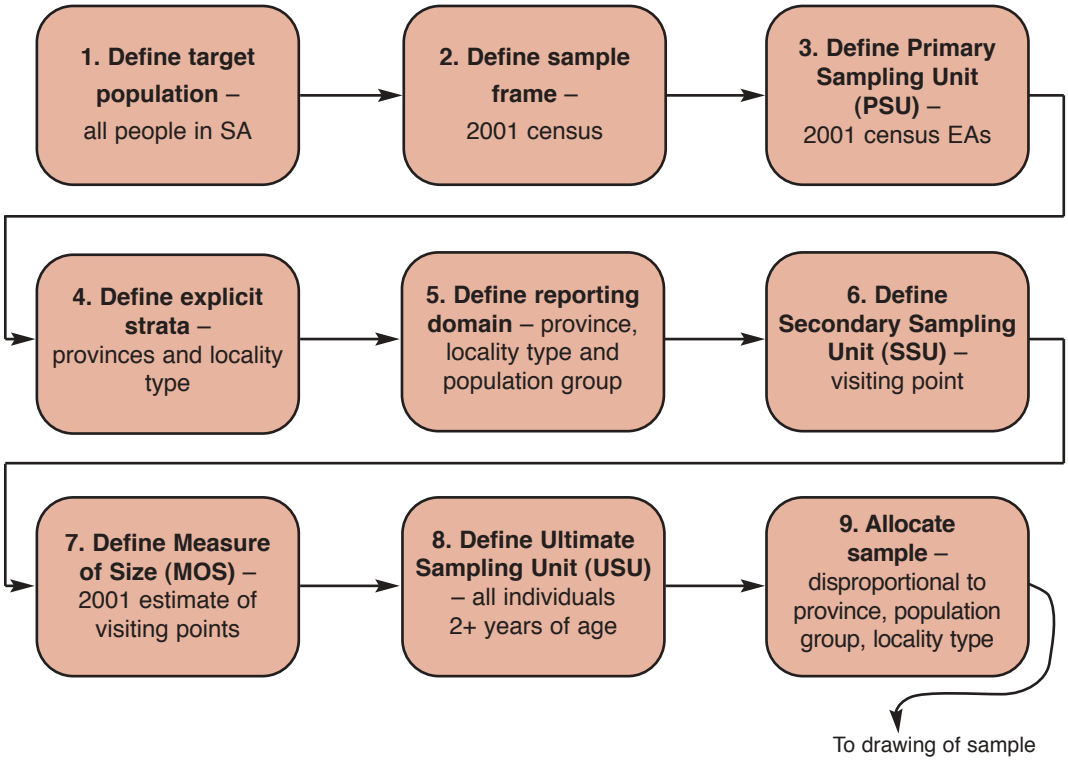
This project used the HSRC's Master Sample (HSRC 2002). A master sample is defined as a selection, for the purpose of repeated community or household surveys, of a probability sample of census enumeration areas throughout South Africa that are representative of the country's provincial, settlement and racial diversity.

The sampling frame that was used in the design of the master sample was the 2001 census Enumerator Areas (EAs) from Statistics South Africa (Stats SA). The target population for this study were all people in South Africa, excluding persons in so-called special institutions (e.g. hospitals, military camps, old age homes, schools and university hostels). The EAs were used as the Primary Sampling Units (PSUs). Although the 2001 census data is not yet available, it was decided to use the 2001 EAs for the master sample because the sampling units would remain relevant for future surveys conducted by the HSRC for the next five to ten years.

The sample was designed with two main explicit strata, namely, provinces and the locality type (also known as geotype in this study) of the EA. In the 2001 census, the four locality types are urban formal, urban informal, rural formal (including commercial farms) and tribal areas (i.e. the deep rural areas). In the formal urban areas, race was also used as a third stratification variable. What this means is that the Master Sample has been

designed to allow reporting of results (i.e. reporting domain) at a provincial, locality and race level. A reporting domain is defined as that domain at which estimates of a population characteristic or variable should be of an acceptable precision for the presentation of survey results.

Figure 1: Steps in the sample design



The census 2001 EA data provided by Stats SA for drawing the sample contained an estimate of the number of dwelling units (DUs) or visiting points (VPs). A visiting point is defined as a separate (non-vacant) residential stand, address, structure, and flat in a block of flats or homestead. The 2001 estimate of visiting points was used as the Measure of Size (MOS) in the drawing of the sample. The visiting point is the Secondary Sampling Unit (SSU) in each of the selected PSUs. In this study, all people in all the households resident at the visiting point were initially listed, after which the eligible individual was randomly selected in each of the following three age groups 2–14, 15–24 and 25 years and older. These individuals constituted the Ultimate Sampling Units (USUs) of this study. Having completed the sample design, the sample was drawn with 1 000 PSUs or EAs being selected throughout South Africa (see Figure 2). These PSUs were allocated to each of the explicit strata. With a view to obtaining an approximately self-weighting sample of visiting points (i.e. SSUs), (a) the EAs were drawn with probability proportional to the size of the EA using the 2001 estimate of the number of visiting points in the EA database as a measure of size (MOS) and (b) to draw an equal number of visiting points (i.e. SSUs)

from each drawn EA. An acceptable precision of estimates per reporting domain requires that a sample of sufficient size be drawn from each of the reporting domains. Consequently, a cluster of 11 VPs were systematically selected on the aerial photography produced for each of the EAs in the master sample.

Since it is not possible to determine on an aerial photograph whether a 'dwelling unit' is indeed a residential structure or whether it was occupied (i.e. people live there), it was decided to form clusters of 11 dwelling units per PSU, allowing on average for one invalid dwelling unit in the cluster of 11 dwelling units. Previous experience at Statistics SA indicated a sample size of 10 households per PSU to be very efficient, balancing cost and efficiency.

Table 4: Final allocation of EAs (i.e. PSUs) to explicit strata

LOCALITY TYPE	PROVINCE	POPULATION GROUP (RACE)				TOTAL
		African	Coloured	Indian	White	
Urban formal	Western Cape	8	63	5	28	**104**
	Eastern Cape	17	21	2	26	**66**
	Northern Cape	14	22	0	21	**57**
	Free State	18	6	0	18	**42**
	KwaZulu-Natal	15	8	79	20	**122**
	North West	15	4	0	15	**34**
	Gauteng	32	17	30	58	**137**
	Mpumalanga	13	2	2	19	**36**
	Limpopo	10	0	2	14	**26**
Subtotal		**142**	**143**	**120**	**219**	**624**
Urban informal	Western Cape	10	2	0	0	**12**
	Eastern Cape	12	3	0	0	**15**
	Northern Cape	3	2	0	0	**5**
	Free State	9	1	0	0	**10**
	KwaZulu-Natal	15	0	0	0	**15**
	North West	4	0	0	0	**4**
	Gauteng	23	2	0	0	**25**
	Mpumalanga	8	0	0	0	**8**
	Limpopo	3	0	0	0	**3**
Subtotal		**87**	**10**	**0**	**0**	**97**

LOCALITY TYPE	PROVINCE	POPULATION GROUP (RACE)				TOTAL
		African	Coloured	Indian	White	
Rural informal	Western Cape	0	0	0	0	**0**
	Eastern Cape	36	2	0	0	**38**
	Northern Cape	0	0	0	0	**0**
	Free State	10	0	0	0	**10**
	KwaZulu-Natal	33	1	0	0	**34**
	North West	24	1	0	0	**25**
	Gauteng	0	0	0	0	**0**
	Mpumalanga	20	0	0	0	**20**
	Limpopo	50	0	0	0	**50**
Subtotal		**173**	**4**	**0**	**0**	177
Rural formal	Western Cape	3	10	0	0	**13**
	Eastern Cape	9	3	0	0	**12**
	Northern Cape	6	7	0	0	**13**
	Free State	11	2	0	0	**13**
	KwaZulu-Natal	15	0	0	0	**15**
	North West	12	0	0	0	**12**
	Gauteng	3	0	0	0	**3**
	Mpumalanga	11	0	0	0	**11**
	Limpopo	10	0	0	0	**10**
Subtotal		**80**	**22**	**0**	**0**	**102**
Total	Western Cape	21	75	5	28	**129**
	Eastern Cape	74	29	2	26	**131**
	Northern Cape	23	31	0	21	75
	Free State	48	9	0	18	75
	KwaZulu-Natal	78	9	79	20	**186**
	North West	55	5	0	15	75
	Gauteng	58	19	30	58	**165**
	Mpumalanga	52	2	2	19	75
	Limpopo	73	0	2	14	**89**
Grand total		**482**	**179**	**120**	**219**	**1000**
Aimed allocation		**480**	**180**	**120**	**220**	**1000**

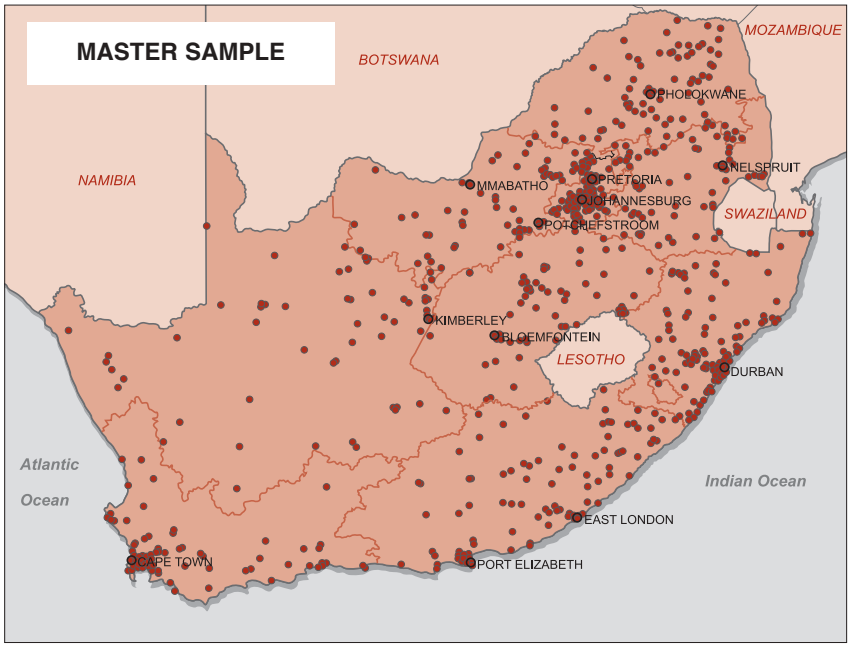


Figure 2: Location of Master Sample PSUs in South Africa

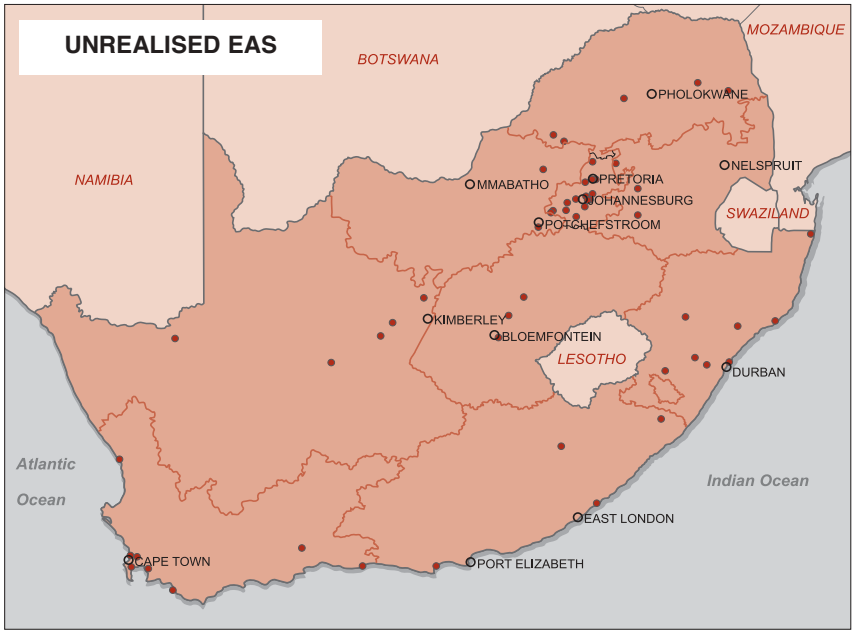
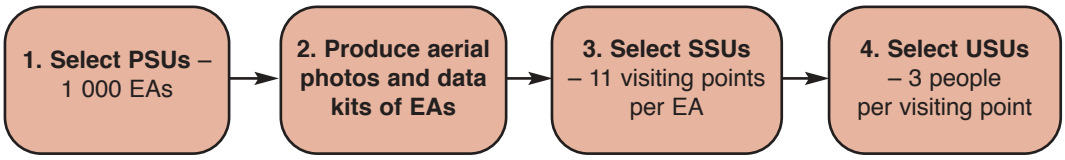


Figure 3: Location of unrealised EAs in the survey

A major problem in the allocation of the sample, especially relating to race in urban formal areas, arose from the fact that no information about race was available on the pre-census 2001 EA database, which was still being processed by Stats SA at the time of the sample being drawn. Using race data from the 1996 census EAs and then overlaying them geographically on the 2001 census EAs solved this problem. Furthermore, field teams physically visited some urban EAs to verify the 'racial painting' of each EA. In this way estimates of the number of people in each race group were obtained for the 2001 census EAs and the sample race distribution was later compared to the 1996 census population and is shown in Table 7. In order to meet the criterion of having acceptable precision per race, the EA sample had to be allocated highly disproportionately to the explicit strata, resulting in allocated EA sample sizes (per stratification variable) as given below:[1]

The highly disproportionate allocation of the EA sample to race resulted in a considerable over-representation of the locality type urban formal, since the vast majority of Indians and whites live in formal urban areas. Furthermore, Indians living primarily in KwaZulu-Natal and Gauteng and coloureds in the Western Cape, resulted in a relative over-representation of these provinces in the EA sample (e.g. KwaZulu-Natal compared to Eastern Cape). Finally, provinces as strata resulted in an over-representation of the smaller provinces (such as Northern Cape) compared to the larger provinces. Although some minorities and Northern Cape province were over-sampled, this was corrected through adjusting weights after the study as explained below. The entire process of sampling is depicted in Figure 4.

Figure 4: Steps in the drawing of the sample



2.3 Weighting of the sample

The steps required to weight the data are presented below and depicted graphically in Figure 5.

Step 1 – Calculating the sampling weight

The SAS (Survey Analysis Software) procedure Surveyselect was used to draw the sample of EAs from the 86,000 EAs in the 1996 population census. The EAs were drawn using probability proportional to size (pps) sampling and the estimated number of visiting points was used as the MOS. Therefore, the data file of drawn EAs contained the selection probabilities as well as the sampling weights of these EAs. In the case of small EAs (i.e. EAs with an estimated number of visiting points less than 100), one or more neighbouring EAs were also identified and combined with the small EA to form a new PSU. Thus, a PSU is defined for the study as a cluster of at least 100 visiting points (estimated). The first step was to calculate the sampling weight of those PSUs consisting of more than one EA. This was done simultaneously with Step 3.

1 The population group allocation is only approximate since coloureds and whites will also be found on farms and coloureds in informal urban EAs

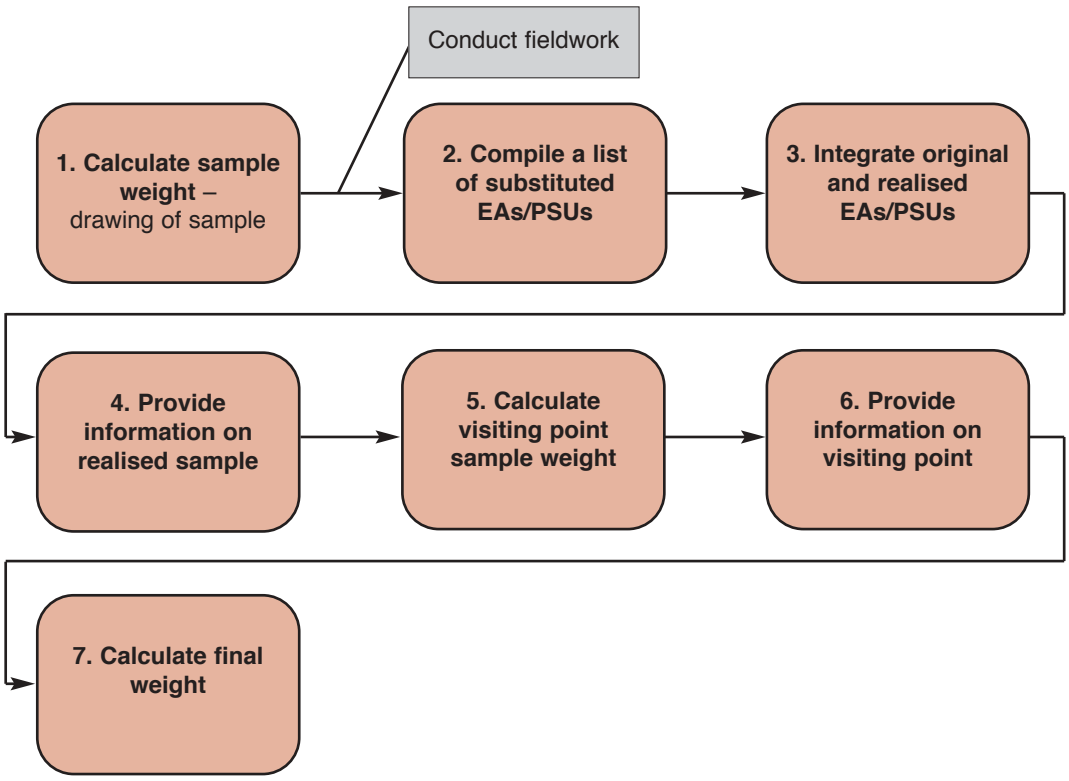
Step 2 – Compiling a list of substituted EAs/PSUs
A list of all EAs/PSUs that were substituted during the study was compiled. This list included the following details relating to the original and substituted EAs/PSUs:

- EA number, EA type description, locality type, region name, place name and reason for substitution;
- Details of EAs/PSUs entirely deleted from the sample (if any) due to whatever reason;
- Finally, detailed information was also required on the PSUs where the locality type and/or EA type were incorrect in the original pre-census 2001 EA database (e.g. an EA with an informal urban code was drawn when in fact it was a formal urban area).

Step 3 – Integration of original and realised EA lists
This step involved the integration of the information on substituted and/or deleted EAs/PSUs (Step 2) with the original drawn sample (Step 1). This step also included the 'correction' of the sampling weights of the substituted EAs/PSUs, as well as 'correcting' the consequences of any deleted EAs/PSUs.

Step 4 – Provision of information on realised sample
In respect of all realised EAs/PSUs or the final sample used in this study, the following information was required:

Figure 5: Steps in the weighting of the sample



- The number of visiting points counted on the aerial photographs (or obtained by a physical count in the field);
- The number of invalid visiting points (such as an empty house, not being a residential unit, etc.) among the 11 systematically drawn visiting points in the PSU;
- The actual number of visiting points among the 11 that participated in the study. Note that, in the case of a visiting point with more than one household, a visiting point would have been considered as a participant even if only one household at the visiting point responded (i.e. if one or more records are available for that VP);
- In the case of farms, the total number of farms in the EA/PSU as well as the number of farms actually drawn.

Step 5 – Calculating the visiting point sampling weight
The visiting point sampling weight was the counted number of visiting points in the EA divided by the number of visiting points participating in the survey. The final visiting point sampling weight was then taken as the product of the EA sampling weight and the visiting point sampling weight.

Step 6 – Providing visiting point information
The next step involved collecting the following information for all households at every participating visiting point in all responding EAs/PSUs:

- The number of persons by sex and age for all age groups (specifically including children 2–14 years, youth 15–24 years and adults 25 years and older). Only one person was randomly drawn in each of the three age groups;
- The (dominant) race;
- Whether or not a drawn person refused to respond;
- The number of households at visiting points that were not prepared to participate in the study;
- In the case of a farm EA, the total number of visiting points counted on the aerial photographs covering all farms or, alternatively, the total number of farms, the number of farms selected, the number of owner houses and the number of labourer houses on each selected farm and whether an owner house and labourer houses or only labourer houses were selected on the farm;
- The number of labourer houses selected on each selected farm;
- The total number of owner and labourer households as well as the number of selected households on each selected farm. In respect of the selected households, the same personal information regarding sex, age and race as indicated above was required.
- Refusal and other non-response information were also required.

Step 7 – Calculation of final record weight
In this step the integration of all the above information occurred and the final sampling weight for each data record was calculated. This weight is equal to the final visiting point sampling weights (as given in step 5) multiplied by the selected person's sampling weight per visiting point per age group.

2.4 Questionnaire development

Four different questionnaires were developed for the following groups: adults, youth, children aged 12–14 and parents/guardians of children aged 2–11 years. However, a core

of similar questions was included in each of the questionnaires to allow simultaneous analysis of data collected in each of the four age groups. Details of questionnaire development process and content are discussed below.

2.4.1 Adult and youth questionnaires

A review of previous international literature, experience of previous behavioural surveys carried out on smaller samples in South Africa, and a qualitative component involving 47 focus groups and 41 key informant interviews across people of different races, ages, locality types, provinces and urban and rural areas informed the development of the questionnaires. As part of the qualitative study component, the interviewers conducted key informant interviews among traditional leaders, traditional healers, religious leaders and youth initiation leaders from different South African language groups.

In focus groups, the researchers asked questions that tapped information on: (a) cultural understandings of HIV/AIDS, (b) gender, (c) sexual practices including sexual violence, (d) rites of passage, (e) marriage practices, (f) death rites and observances, (g) mass media and (h) acceptance of HIV testing. In key informant interviews, the researchers asked about cultural understandings of HIV/AIDS and sexual practices including sexual violence.

Interviews were conducted in the language of the group or people interviewed and were tape-recorded. These were all translated into English. Due to the volume of information, the data were analysed using a computer-assisted qualitative data analysis software programme, Atlas.ti (Version 4.2), to tease out key themes on psychosocial, cultural and economic factors that influence behaviour. A multidisciplinary team took part in interpreting the findings and found intra- and inter-focus group variation among participants with regard to a host of issues such as attitudes towards people living with HIV/AIDS (PLWHA), knowledge and risk behaviours related to HIV/AIDS, gender roles in relationships, reasons for sexual violence, sexual myths, and practices related to marriage and cohabitation.[2]

Based on the results of the focus groups and key informant interviews, as well as a review of the local and international literature on previous socio-behavioural research surveys, especially Family Health International's (FHI) Behavioural Surveillance Systems documentation, the adult and youth questionnaires were developed with a specific focus on the areas listed below:

It is worth pointing out here that we took a conscious decision not to use the FHI's questionnaires for two reasons. First, the National Department of Health was about to tender the second time for such a study and there was no need for duplication. Second, we particularly sought to highlight the socio-cultural factors and context that is found in South Africa.

Measurement of the impact of mass media and communication
Working from the matrix of HIV/AIDS and communication activities described in Table 3 in Section 1.3.1, the mass media and communication questions developed for the study examine a number of key aspects including:

2 A detailed report on the findings is included in a separate HSRC report (in preparation)

Table 5: Areas of focus in the adult and youth questionnaires

MEASURES	ADULT	YOUTH
1. Demographic – age, sex, race, education, province, language, religion, employment, source of income and adequacy of such income, locality type (urban/rural)	X	X
2. Orphanhood status		X
3. Male circumcision	X	X
4. Marital status and marriage practices	X	X
5. Initiating intimate relationships and sexual debut		X
6. Sexual practices, including HIV/AIDS-related behaviour and condom use	X	X
7. Perceived risk of HIV	X	X
8. Voluntary counselling and testing	X	X
9. Sexual violence and coersion	X	X
10. Alcohol and drug use	X	X
11. Knowledge, attitudes and perceptions of HIV/AIDS	X	X
12. Stigma	X	X
13. Public perceptions on HIV/AIDS policies, financing and structural factors	X	X
14. Mass media	X	X
15. Health status, including history of hospitalisation	X	X

- Mass media access and frequency of access;
- Access to alternative media forms;
- Orientation to HIV/AIDS campaign and news media content;
- General knowledge;
- HIV/AIDS information needs;
- Recall of HIV/AIDS messages;
- Awareness of helpline services;
- Access to contextual HIV/AIDS communication;
- Dialogue about HIV/AIDS;
- Involvement in HIV/AIDS activities; and
- Direct experience of HIV/AIDS.

The questions provide a framework for understanding mass media, but also for contextualising mass media interventions within the broader communication context. The broader questionnaire and HIV data allows for correlation of these factors with related behavioural indicators. It must be noted however, that awareness of specific mass media campaigns (aside from Helplines) has not been included. The rationale for this is as follows: Firstly, mass media campaigns and campaign components change from year to year, and it is necessary to develop a generic baseline against which subsequent surveys can be matched. Secondly, many mass media activities are not consciously branded, and

thus a comparative measure of campaign awareness cannot readily be drawn. Thirdly, there is a need to develop an understanding of the multiple and varied layers of HIV/AIDS communication that are not necessarily closely related to purposive mass media interventions – for example exposure to news media content, community level HIV/AIDS activities, direct experience of HIV/AIDS, and involvement in HIV/AIDS activities.

2.4.2 Child and parent/guardian questionnaires

Two questionnaires were developed:
- A questionnaire for caregivers of children aged 2–11 years;
- A questionnaire for children aged 12–14 years.

These questionnaires were developed in conjunction with the other questionnaires used in this study, namely, the preliminary household demographic questionnaire as well as the adult and youth questionnaires. The development of the child and caregiver questionnaires was informed by existing literature in the areas of:
- Risk for children of sexual abuse;
- Sexual debut and pregnancy in children;
- Levels of knowledge about sex and HIV;
- Media impact on awareness and knowledge of HIV.

While there is little available information to guide the selection of indicators of infection in children, existing literature suggests that the above should be taken into consideration. Two sections of the questionnaires for both caregivers and children, namely, home environment and care and protection, covered situations where children might be at risk of sexual abuse and therefore of HIV infection. Questions dealt with:
- Risk at home including parental presence, presence of lodgers and other male relatives as well as sleeping arrangements and levels of care, monitoring and supervision, drug and alcohol use;
- Risk in the local environment including housing, type of residential area, businesses which sell cigarettes and alcohol in the area;
- Risk at caregiving facilities such as crèches and schools, levels of care, monitoring and supervision.

Sections of the questionnaire for children 2–14 years of age which were common to both the adult and youth questionnaires, focused on:
- Demographic characteristics including poverty levels, education level, religious affiliation, parental mortality/orphan status;
- Knowledge and communication about sex and HIV/AIDS in families, communities and the media;
- Sexual experience and behaviour including use of condoms, number of partners etc.;
- Traditional practices and experiences, e.g. circumcision;
- General health status.

The measures included in the parent/guardian and child questionnaires are listed in Table 6. Many of these measures are not analysed in this report, but the results will be presented at a later date.

Table 6: Areas of focus in the parent/guardian and child questionnaires

MEASURES	PARENTS/ GUARDIANS Of children aged 2-11 years	CHILDREN 12-14 years
1. Demographic-age, sex, race, locality type (urban/rural), province, marital status*, education, language, religion, employment*, source of income* and adequacy of such income*, relationship to child*, number of dependants*	X	X
2. Orphanhood status	X	X
3. Child's home environment	X	X
4. Care and protection of the child	X	X
5. Educating the child on life issues	X	
6. Sources of information on HIV/AIDS and media impact	X	
7. Hospitalisation history and health status	X	X
8. Knowledge and communication about HIV/AIDS		X
9. Sexual experience and behaviour		X
10. Circumcision		X

** This was only asked to the guardian/parent*

2.4.3 Translation of questionnaires

Professional translators as well as the fieldworkers translated the questionnaires into eight other South African languages: Afrikaans, IsiZulu, IsiXhosa, SePedi, SeSotho, SeTswana, TshiVenda and XiTsonga. In translating the questionnaires the language used was at times colloquial. The questionnaires were not back translated, but to ensure accuracy in translation, the translated versions were each reviewed by an independent person speaking the same language to compare translated versions with original English texts.

2.5 Selection of specimen collection devices and HIV test kits

In order to improve the participation rate in the survey, it was decided to obtain specimens of oral transudate (contained in saliva) rather than blood. There is currently only one oral transudate specimen collection device that is registered with the US Food and Drug Administration (US FDA) and that is the OraSure® HIV-1 Oral Specimen Collection Device. This device is licensed to be used only with the Vironostika HIV Uni-Form Ii Plus O testing kits. The sensitivity and specificity of the Orasure device when tested with the Vironostika EIA is 99%, and also 99% according to the manufacturers (Gallo et al. 1997). All laboratories were prepared to use the Vironostika test kits and to do the testing according to the manufacturers guidelines. In order to standardize the testing procedures used in the study, the following Standard Operating Procedures (SOPs) were customized or specifically designed for the purposes of this study:

- Standard Operating Procedures for collecting, storing and transporting oral fluid using the OraSure® HIV-1 Oral Specimen Collection Device;
- Standard Operating Procedures for VIRONOSTIKA HIV UNI-FORM II plus O;
- Standard Operating Procedure for inter-Laboratory Quality Control for the study.

2.5.1 Selection of HIV testing laboratories

This study is the largest project of its kind ever undertaken in South Africa and because of the large number of specimens collected and the short duration of the study, no single laboratory was able to handle the number of specimens. Therefore, it was decided to select three laboratories and to share the workload among them. Criteria for laboratory selection were:

- The laboratory needed to have substantial experience in conducting HIV ELISA tests and needed to do such tests as part of its routine operations;
- The laboratory needed to have both internal and external quality control measures in place that were acceptable;
- The laboratory needed to be prepared to sign a contract with the HSRC.

Based on the above criteria the following three laboratories were selected to conduct the HIV testing for this study:

- University of the Witwatersrand, CLS (Contract Laboratory Services) – Johannesburg
- University of Natal, Department of Virology – Durban
- MEDUNSA, Department of Virology – Pretoria

2.6 Ethical considerations

This study followed the generally established principles regarding linked anonymous confidential or anonymous testing <http://www.cdc.gov/mmwr/preview/mmwrhtm/rr481a.1.htm>:

- Research participants needed to be informed as to the purpose of giving a sample for HIV testing and they needed to give consent for this; and
- VCT needed to be offered if it was desired.

Regarding children and consent, we followed the dictates of existing legislation:

- Current law states that a child of 14 years and older may give consent to medical treatment. Therefore any child younger than 14 years needed to have the consent of their parent or guardian; and
- Children between the ages of 12 and 14 years who are capable of understanding what the research was about were also asked to give verbal consent. We made a decision that anyone under 12 years of age would not be considered capable of answering a questionnaire and that the primary caregiver should answer a questionnaire about the child.

Regarding testing, all children between 2 and 14 years of age were asked for their verbal consent to take a saliva sample, regardless of whether or not they personally gave consent for participation in the study or proxy consent was given by their parent or guardian.

Regarding the issue of mandatory reporting of child abuse (Child Care Act No 74, 1983), we took the following decisions:

- No questions would be asked directly about child abuse in the survey.
- Voluntary information about a child's experiences of sexual abuse would be handled on an individual case-by-case basis in consultation with the supervisors and the principal investigators of the study.
- Details of the nearest social work offices and Child Protection Units would be made automatically available to each participating household should the need arise.

In order to make sure that our research on children was conducted according to the highest ethical standards, we also introduced the following additional measures:

- A manual accompanied the questionnaires with a short introduction for each section, saying what would be covered in the section, explaining why the questions were being asked, and assuring participants of the confidentiality of their responses.
- Training was given and ethical guidelines included in the training manual. Specific training was given on the management of children and of crises that might arise in the field.
- Field workers were monitored, as ethical provisions are only as good as the extent to which field workers apply them.

The research team submitted the original proposal to the HSRC's Interim Ethics Committee for approval, which approved the study after some amendments were made. Below is a description of how the team complied with acceptable ethical standards.

This community-based household study covered the general population but also included vulnerable groups. The latter included people with terminal illness, children, adolescents, and pregnant women, people living with HIV/AIDS and those with limited exposure to research. For this reason, care was taken to ensure that ethical practice conformed to the internationally accepted guidelines, which advocate respect of persons, beneficence and non-maleficence, and justice (CIOMS 2000; Department of Health 2000).

All youth and adults who agreed to participate gave written or verbal (where respondent was illiterate) consent. Parents and guardians of children under 15 years were asked to give informed consent for inclusion of children in the survey and verbal consent was obtained from all children who gave a specimen for HIV testing. Fieldwork staff were trained to ensure that this was done properly.

To comply with internationally accepted ethical standards, the researchers also took the following measures:

- No names of individuals were recorded on the questionnaires nor on the oral fluid specimen; instead bar codes with the same numbers were pasted on the questionnaires, the laboratory results sheet and the saliva specimen.
- The specimens were sent to the laboratories at MEDUNSA in Pretoria, Wits in Johannesburg and UND in Durban.
- The HIV test results and the questionnaires were linked electronically through bar codes, making this a *linked anonymous HIV testing survey*.
- The participants were not given their results because by design the study made it impossible for fieldworkers to know the HIV status of participants.

- Patients who asked to know their HIV status were given a referral card to visit any of the nearby Voluntary Counselling and Testing (VCT) sites to undergo voluntary counselling and testing.
- To ensure confidentiality, data was analysed nationally, provincially and by EA type and not by smaller geographic units. The EA number was deleted from the data files once linking was completed.

2.7 Compensation for participation

The HSRC Interim Ethics Committee raised the possibility of compensation for the study when the initial design was being reviewed. The committee was of the opinion that the principle of justice could be invoked to justify compensation for participation in the study.

A review of the literature showed that compensation to participate in research studies increases response rates. A randomised controlled trial examining the effects of incentives on mail survey showed that incentives increased response rates (Leung et al. 2002) but have a diminishing return if incentives are greater than $5 (Halpern et al. 2002). The socio-behavioural literature on this topic suggested that it is essential to increase participation of respondents by offering a token compensation that has to be sufficient to effectively encourage participation, but that such compensation should not be large enough to coerce participants. The selection of such compensation can be difficult. For this reason, the research team took this question to the 47 focus groups around the country to investigate under which conditions participants would be prepared to partake in a study involving HIV testing. Some focus group members were of the view that R50 ($5) may be sufficient to obtain a reasonable response rate. The research team settled for this amount for the household, regardless of the number of participants. The amount was paid to the head of household or other member (where head of the household was not present), who consented to take part in the study. The research team decided to give R20 ($2) to each hostel dweller agreeing to participate. A higher amount was given to the household because more than one person was likely to partake in the study, whereas for the hostel dweller only one person was to participate. The differential in number of persons who had to be compensated led to differential payment.

2.8 Pilot study

A pilot study preceded data collection. The process entailed testing the feasibility of undertaking the full study by doing a trial run. This was done in 13 EAs in Gauteng province and parts of neighbouring North West province. The pilot study tested the creation of a master sample, collection of household demographics needed for sampling within dwellings or visiting points, administration of the entire set of questionnaires, data management and analysis of results. The pilot study was successful and the following lessons were learned for use in the main study. First, to obtain a reasonable response rate it meant that the fieldwork would need to be done in the evenings and at weekends. Second, the questionnaire proved to be too long and hence would need to be reduced. Third, questions that were not clear were identified. The pilot informed refinement of the research method and questionnaire development.

2.9 Data collection

The researchers collected data in two phases, which are described below.

2.9.1 Phase I: Creation of the master sample and notification of households on the study to be undertaken

Training of field workers in Phase I
Fifteen staff were hired and trained to notify 10 000 households about the upcoming study. These staff were in the process of completing their masters degrees in various disciplines in the social and public health sciences. They were aged between 25 and 40 years. Their training included basic facts about HIV/AIDS, specifically about the status of the epidemic, modes of transmission and HIV testing. Training also focused on the research method to be used as well as ethics in conducting studies on sensitive subjects such as this one. Sensitivities to culture, language and the nature of the subject, sexuality and HIV/AIDS, were stressed throughout the training.

Realising the difficulty of accessing potential participants in some EAs, especially farms, hostels, security complexes and wealthy gated neighbourhoods, staff were trained in successful strategies for entering such communities. These included notification of gatekeepers such as chiefs, counsellors and police. Staff were also trained in basic interviewing skills and how to complete the visiting point questionnaires to be used later in selecting respondents from households. This information was necessary to prepare for Phase II of the study described below.

Through a competitive process, the HSRC hired a company to develop a master sample for use in conducting repeated and/or longitudinal surveys of the same households or same census enumeration areas over a five-year period. To develop such a sample, it was necessary to appoint a service provider with expertise in remote sensing and census. The company awarded the contract was Geospace International. With the assistance of 15 HSRC staff members, Geospace implemented a master sample and filled it with a database used to generate up-to-date field maps of all census enumeration areas created by HSRC staff and an HSRC statistical consultant.

The sample of visiting points was drawn at the same time as the households at the selected visiting points were notified about the upcoming HIV/AIDS survey. This process, described next, lasted for four months.

Fifteen fieldwork teams were deployed throughout South Africa to conduct Phase I of the study. Given the history of South Africa, the researchers ensured that each team matched, as closely as possible, the racial and language diversity found in the EAs where Phase I was conducted. This means someone who spoke the language of the potential respondents approached household members. The research team believed this would increase the response rate. Indeed where this rule was violated during fieldwork, the response rate was low, requiring a revisit to 72 EAs.

Each research team visited the selected visiting points and established which of these were valid homes. They informed the household members, usually the head, about the

study objectives and methods, and that an oral fluid sample to be tested for HIV would be taken from people willing to participate. After discussing the study with member(s) of the household, the team left a letter describing the study in greater detail, with contact numbers should they subsequently have any questions. At a later stage in the study, to support the legitimacy of the research, the research team left a letter from the leaders of the Nelson Mandela Foundation and Nelson Mandela Children's Fund informing participants of the study. If consent was granted, the field staff administered the Visiting Point Questionnaire (VPQ), which recorded basic demographic data regarding the household, such as age, gender, and race, as well as other information regarding the location of the dwelling unit or visiting point.

In the case of non-contacts, where no one from a household at a VP was present at the time of the visit, the teams were required to repeat visits to the household twice (that is, a total of three visits), preferably on different days and at different times of the day in order to ensure a maximum contact rate.

In cases where EAs were vacant, such as industrial areas and office buildings, or where non-contacts were unacceptably high due to lack of access, the EAs were substituted with completed EAs of the same type and within the same area. In some areas in Gauteng and Cape Town following the first visit, wherein the response rates were very poor, retired nurses improved response rates substantially by revisiting the dwelling units. This process involved matching both race and language of the households with that of the nurses where possible.

2.9.2 Phase II: Fieldwork for the main study

Training of fieldworkers for Phase II
Once the information on the visiting point questionnaires had been captured and participants in each household had been chosen randomly using a computer-based program, a pack was couriered to the supervisors of field staff teams in all provinces, containing aerial photographs, route maps and a road atlas, global positioning system (GPS) equipment, four questionnaires as well as Orasure test kits.

A total of 171 recently retired nurses (all females except for four males) were deployed in 34 teams for fieldwork during this phase. One supervisor led a team of one to four nurses who did fieldwork. Most teams worked on a provincial basis although a few crossed provincial borders to help in areas in other provinces that were too large to handle for the teams within that particular province.

Apart from the provision of questionnaires and Orasure testing kits to fieldworkers, supervisors were tasked with the work of identifying the correct DU or VP, and dropping off a fieldworker to conduct interviews with pre-selected participants and collecting oral fluid specimens. As with the notification fieldworkers in Phase I, they also had to report to the relevant community gatekeepers and the local police. Sometimes the teams working in dangerous areas sought police escort to the EA or were escorted by local councillors or their representatives. The supervisors also had to inform local VCT centres, especially local Primary Health Care (PHC) centres, about the study as well as the fact that some of the participants would require their VCT services if they wished to know their HIV status.

Once they had been dropped at the DU or VP, the fieldworker had to, without having a name of the individual, identify the correct pre-selected respondents in the household and interview each one individually in a private place to ensure confidentiality. This was done after obtaining either written or verbal informed consent. After the interview was completed, following the standard operating procedures for HIV testing, the nurse took a oral fluid specimen. The nurse then paid the R50 or R20 compensation to the head of the household or hostel participant (in the case of a mine hostel dweller) and immediately submitted the completed questionnaires and the oral fluid specimens to the supervisor who checked and recorded them on the tracking sheets.

After completion of an EA, the fieldwork kits with the questionnaires and relevant administrative forms were sent to the HSRC's head office in Pretoria. The oral fluid specimens were packaged and sent directly to the relevant selected research laboratories for testing, depending on the province in which they were administered.

Once at the HSRC, the questionnaires were sorted and sent to the coders who did additional quality assurance and coding of the open-ended questions. As soon as coding was complete for a batch of questionnaires, the batch was sent for data capturing. Once the questionnaires were captured, the electronic data and hardcopy materials were sent back to the HSRC for analyses and storage, respectively.

2.10 Quality control for Phase I

Data quality in Phase I was achieved through the following methods:

- The information filled out on the EA Fieldwork form was checked for omissions and accuracy. The data was then captured onto a digital database. The GPS coordinates captured in the field for each VP were checked against the coordinates supplied in the office from the GIS for correspondence. If major discrepancies were found, the VP was re-visited or other appropriate corrective action was taken;
- Cluster sampling done in the field for flats, hostels or farm areas was checked for correctness;
- The digital photos taken of the VPs were downloaded into computer files, checked for correctness and re-named to match the correct VP name;
- The route descriptions as well as captured landmarks were checked for correctness. If not satisfactory, the EA was re-visited;
- All relevant maps, EA Fieldwork forms and other fieldwork materials were then sorted per EA. A check was done to make sure all materials were accounted for and were in good condition;
- Administrative control forms were completed;
- All the captured digital data was written onto compact disk (CD) and couriered with the hardcopy materials to Geospace International;
- The data filled out on each Visiting Point Questionnaire (VPQ) was checked for completeness and mistakes. If not satisfactory, the EA was re-visited;
- All administrative forms regarding the staff were completed.

The relevant hardcopy questionnaires and forms were couriered with the other materials to Geospace.

After receiving data from the field, quality assurance was done by the office staff. This was accomplished as follows:

- The GPS points that were downloaded onto the database were overlaid onto the digital aerial photograph of the relevant EA in order to check whether the correct VP was visited. If discrepancies existed, the EA data was sent back to the field;
- The route description was added to the database and checked for typing errors and the like;
- Digitised landmark data was double-checked for accuracy;
- In EAs where cluster sampling was done in the field, the sampling was double-checked. If any queries came up, the supervisor was contacted to resolve the issue.
- Once all the data was provided, database redundancy checks were run;
- All maps created were checked for errors such as pixelisation, errors in the legend such as incorrect route descriptions etc., as well as overall image quality.

2.11 Quality control for Phase II

Quality assurance was done by relevant staff regarding the following:

- The quality and correctness of the VPQs sent in from Phase I fieldwork;
- The quality of the data capturing done by the contractor employed to do data entry;
- The completeness and correctness of fieldwork kits and materials sent to the various Phase II supervisors in the field.

Quality assurance was done by the Phase II supervisors regarding the following:

- The general conduct and competence of the fieldworkers;
- The correctness and completeness of the questionnaires, especially where open ended questions were concerned;
- The administration of the saliva samples;
- The administration of the bar code stickers and the laboratory tracking forms;
- The final deliverables sent to the HSRC and the relevant research laboratories.

2.12 Data management and analysis

After data were received from the capturing company, programs were run to validate the reliability of data. These are described below.

First, information of the respondent or non-respondent was corrected if it was missing, e.g. age, gender and race.

Second, routine computer programmes were run to correct problems with regard to province, to check that females did not answer male sections in the questionnaire and vice versa. Additional routines were written to address the flow of skip patterns in the questionnaire, and VP questionnaires were matched to Phase II questionnaires.

Third, data were corrected for errors such as substitutions of census enumeration areas and coding errors.

These quality control procedures were followed each time a new batch of data was received from the capturers.

Datasets were then converted to Statistical Package for the Social Sciences (SPSS) and frequency distributions were run to check that all variables contained only values in the accepted range and variable labels. During this exercise, attention was also given to 'outlying' values. These were followed up by drawing the physical questionnaires and correcting them to the best of our ability programmatically. After the datasets were edited, programs had to be written to calculate weights. Unweighted data were analysed using the SPSS and SAS computer software. Weighted data were analysed using computer programs which are able to take into account the weighting of individual responses according to sampling design in the computation of statistical univariate tests as well as multivariate analysis (STATA and SAS).

2.13 Strengths and limitations of the study

2.13.1 Strengths

Firstly, the sample size (N=9 963) is large enough to allow for meaningful analyses of data on key socio-behavioural determinants, mass media information and HIV test results to enable generalisation of the results. This is the first national South African study that systematically investigates the socio-cultural, political, economic and structural context within which HIV-related behaviour occurs. Such information is crucial to designing interventions to reduce new infections. This is a major strength of the study.
Secondly, the study is based on a sampling approach that ensures representivity of the South African population. The study used a multi-stage, stratified, cluster sampling approach to draw the EAs, and visiting points and individual participants were selected randomly within dwellings. For this reason, the results obtained are generalisable to the nation, provinces, children, youth and adults, and also to each of the four locality types (geotypes) of census enumeration areas: urban formal, urban informal, farm and tribal areas. For the first time, South African policy makers, planners, non-governmental organizations (NGOs) and the public will have information on HIV prevalence for people of different races and for those living in urban areas, whether in formal or informal dwellings, farms or rural areas.

Thirdly, the study uses a master sample that allows for repeated surveys in the same household or in the same EA to track changes in population behaviour, exposure to information for HIV prevention and HIV status.

Finally, this is the first ever South African, national, community-based study that simultaneously investigated the three key elements necessary for monitoring a national response to the HIV/AIDS epidemic. Thus the research includes a study of behaviours related to HIV/AIDS, HIV status based on a test, and of the impact of communication aimed at curbing the spread of HIV. This study serves as a baseline for follow-up in 2004/5 to track changes in behaviour, HIV prevalence and the extent to which mass communication reaches the population, thus providing ongoing monitoring of the South African national response to the HIV/AIDS epidemic.

2.13.2 Limitations

There are however two obvious types of limitations, those inherent to any cross-sectional socio-behavioural studies and those specific to this study.

Limitations inherent in cross-sectional studies
In all cross-sectional studies, the exposures and outcomes are measured at the same time and hence there can be difficulties in determining causality.

The difficulties in determining the temporal sequence of HIV infection and potential risk factors is exacerbated when using prevalent rather than incident cases of HIV because some of the infections may have occurred up to ten years ago whereas questionnaires inquire about current risk behaviours. Individuals may well have changed their behaviour since becoming infected for a variety of reasons that may or may not be due to their HIV status. This limitation has however been systematically taken into account when designing statistical analysis and when interpreting the results.

Another limitation, common to nearly all surveys about knowledge, attitudes, beliefs and behaviours toward HIV/AIDS, is that it is based on respondents' self-declarations. Self-declarations may be affected by recall biases and, when it comes to behaviours in the sphere of individual private lives (such as sexual or addictive behaviours), respondents' answers may also be affected by a social desirability bias, that is, participants tend to provide the answers that they think are socially acceptable. It must however be pointed out that questions used for self-declaration of intimate or socially stigmatised behaviours were questions that have been validated in other scientific surveys dealing with similar issues.

A further limitation of the study, which is also common to most surveys in general populations using a household survey type of design, relates to exclusion of people not living in homes. The study sample includes people who live in homes and hostels. Homes include formal and informal dwellings. The research team defined a household resident as someone who sleeps in a dwelling for four nights per week. Those who stay away from home for more than four days were interviewed in the areas where they temporarily lived. The study also excluded homeless people, those who live in streets or shelters or hotels. The design of the sample purposefully excluded people confined to institutions, such as soldiers, prisoners and students living in boarding schools. Certain of these groups are known to have higher HIV prevalence than the general community. For this reason, the study results are generalisable to people who regularly live in homes.

Finally, the design of this household survey has been conceived in order to allow for detailed analysis of the major sub-populations in South Africa, including over-sampling when necessary to guarantee meaningful comparisons (for example, between the different races in the South African population). However this design and the goal of ensuring national representativeness implies that some groups that may be of particular interest for the understanding of the epidemic could not be captured in sufficient numbers in this survey (individuals with homosexual and bisexual practices, injecting drug users, sex workers, etc.). It must however be acknowledged that similar limitations are encountered by all surveys about sexual and HIV-related risk behaviours based on general population samples in other countries.

Limitations specific to this study
First, although researchers and field workers made every attempt to encourage their participation, the moderately high HIV test participation rates of specific groups makes it difficult to determine HIV prevalence in some sub-populations. This point

will be discussed below in the section dealing with participation and response rates to the survey.

Second, children under two years were excluded by the protocol of this study. The HIV test used in this study, as with all ELISA HIV tests, detects the presence of HIV antibodies in the oral fluid of the participant. Over 99% of people over the age of two years and who are infected with HIV will test positive on the ELISA because almost all PLWHA produce HIV antibodies. However, the situation is more complex for children under two years old because the infant may not be actually infected with HIV him or herself but may, if the mother was HIV infected, still be carrying the mother's antibodies. The child will therefore test positive on the ELISA test even though he/she is not infected (false positive test). In order to determine HIV status in the under two year olds, it is necessary to use nuclear amplification technology tests such as the Polymerase Chain Reaction (PCR) test but these tests are very expensive and not cost-effective to use in a community-based survey of children. For these reasons we decided to exclude children under two years of age from the study. Therefore, this study has logically missed a significant proportion of children who acquired HIV from parental to child transmission.

3. Results

3.1 Reliability and validity of the data

This section reviews approaches for testing the reliability and validity of the data in this survey. It addresses firstly the generalisability of the results, secondly response bias, thirdly testing of reliability of data based on re-interview of the sample, fourthly validity of prevalence estimations, and fifthly reliability of laboratory test results.

3.1.1 Test of generalisability of the survey results

The degree to which the findings from a household survey such as this one can be extrapolated to the entire South African population depends partly on how representative its sample is. In order to test representivity, the distributions of the demographic characteristics of the sample were compared with those of the 1996 census. In addition, in weighting the sample, the evolution of the socio-demographic characteristics of the South-African population between the last publicly available 1996 census and the 2001 census were taken into account.[1] Detailed data from the 2001 census are however not yet available, and therefore it was not possible to explicitly compare the socio-demographic characteristics of respondents against most recent census data.

Table 7 compares the socio-demographic structure of the survey sample to the 1996 South African population census. The socio-demographic characteristics of the weighted sample closely match those of the population census in terms of sex, race, locality type and province. A slight difference of just less than two percentage points is seen between the sample and the population census. These results suggest that the sample is representative of the population from which it was drawn, thus allowing for extrapolation of the findings to the population of persons aged two years and older, who live in homes.

Table 7: Demographic characteristics of the sample in relation to the 1996 population census

DEMOGRAPHICS	2002 WEIGHTED SAMPLE		1996 POPULATION CENSUS	
	N	%	N	%
Sex				
Male	19508149	47.4	19520887	48.1
Female	21634012	52.5	21062685	51.9
Unspecified	26027	0.1	0	0.0
Total	41168189	100.0	40583573	100.0
Race				
African	32304652	78.5	31127631	76.7
White	4297416	10.4	4434697	10.9
Coloured	3553428	8.6	3600446	8.9
Indian	1012693	2.5	1045596	2.5
Unspecified	0	0.0	375204	1.0
Total	41168189	100.0	40583573	100.0

1 This was achieved using weights calculated from the census 2001 preliminary household count, which was updated using fieldwork in this study. (Permission to use the 2001 household counts was obtained from the Statistician General.)

DEMOGRAPHICS	2002 WEIGHTED SAMPLE		1996 POPULATION CENSUS	
	N	%	N	%
Locality type				
Non-Urban	18898707	46.0	18801765	46.3
Urban	22269482	54.0	21781807	53.7
Total	41168189	100.0	40583573	100.0
Province				
WC	3994583	9.7	3956875	9.7
EC	6128993	14.9	6302525	15.5
NC	832471	2.0	840321	2.1
FS	2746914	6.7	2633504	6.5
KZN	8466269	20.6	8417021	20.7
NW	2901607	7.0	3354825	8.3
GP	7711250	18.7	7348423	18.1
MP	3014130	7.3	2800711	6.9
LP	5371972	13.1	4929368	12.2
Total	41168189	100.0	40583573	100.0

3.1.2 Evaluation of response bias

In its design and execution, this survey followed closely the recommended strategies to improve response rates (FHI 2002). The strategies used include: (i) notifying households prior to the study and giving adequate explanation to potential respondents, (ii) selecting retired nurses, who are generally respected in communities, (iii) adequately training nurses to conduct interviews on sensitive subject like HIV/AIDS and sex, (iv) making a maximum of three revisits to the homes, (v) using a linked anonymous survey approach, and (vi) ensuring privacy when conducting interviews. However, there are probably a few instances where some of these strategies were not implemented as rigorously as was required.

To evaluate the response bias, we examined the extent to which the original sample was realised in Phases I and II, as presented in Table 8, bearing in mind that the final sample matched closely the 1996 census population.

Table 8 shows response rates for both phases of the study. Although 1 010 EAs were eventually selected, 970 were realised (96.04%). Of the 10 197 valid visiting points in the 970 EAs, 7 249 were (71.09%) were realised. In the 7 249 visiting points 14 450 individuals were selected and 13 518 (93.55%) were contacted, with 9 963 (73.70%)

Table 8: Response rates for both Phases I and II of the study

Province	EAs* realised Phase I	EAs realised Phase II		Total valid VPs Phase I	VPs realised Phase I		Selected respondents Phase II	Realised respondents Phase II		Respondents interviewed and tested ***		Respondents interviewed and not tested	All respondents interviewed	
	n	n	%	n	n	%	n	n	%	n	%	n	n	%
WC	125	125	100.0	1363	890	65.3	1806	1809**	100.1	1267	70.0	56	1323	73.1
EC	131	130	99.2	1317	940	71.4	1930	1875	97.2	1221	65.1	265	1486	79.3
NC	76	73	96.1	759	545	71.8	992	913	92.0	694	76.0	35	729	79.8
FS	74	68	91.9	772	544	70.5	947	805	85.0	540	67.1	81	621	77.1
KZN	186	180	96.8	1852	1426	77.0	2991	2644	88.4	1579	59.7	445	2024	76.6
NW	74	73	98.7	747	581	77.8	1086	1042	96.0	626	60.1	110	736	70.6
GT	180	162	90.0	1731	1142	66.0	2287	2139	93.5	1272	59.5	255	1527	71.4
MP	74	72	97.3	769	558	72.6	1092	1030	94.3	550	53.4	70	620	60.2
LP	90	87	96.7	887	623	70.2	1319	1261	95.6	679	53.8	218	897	71.1
TOTAL	1010	970	96.0	10197	7249	71.1	14450	13518	93.6	8428	62.3	1535****	9963	73.7

**Total number of EAs exceeds 1000 because some EAs in the WC and GP were revisited during Phase 1 due to initial poor response rates*
*** After revisits a few names were added to the original list of respondents*
**** The 8 428 includes all those whose specimens were usable*
***** Includes 412 oral fluid specimens not useable*

agreeing to be interviewed. Of these 9 963, 8 428 agreed to also give an oral fluid specimen specimen to be tested for HIV. The table also shows the provincial breakdowns. Mpumalanga and Limpopo province had the lowest response rates for HIV testing, whilst Northern Cape and Western Cape had the highest response rates.

The response rates presented in Appendices A1–A3 are based on the 8 428 participants whose HIV test results and questionnaires were linked. Both Table 8 and Appendices A1–A3 show variation in response rates. In terms of EA locality types, the highest response rate was in rural areas while the lowest was in urban formal areas. More females participated than males. With regard to race, the highest response rate was among coloureds and the lowest among whites.

A response rate of 50% in any survey is considered adequate, 60% good and 75% very good (Babbie 1990). Using this criterion, on average, the majority of the response rates in this study were good and others adequate (see Appendices A1–A3). However, a few sub-samples had response rates lower than 50% and are therefore inadequate. Although several similar studies using sub-national samples have consistently reported very good response rates (e.g. Auvert et al. 2001;Buve et al. 2001; Colvin et al. 1998; MacPhail et al. 2002), several large scale international surveys using national samples have reported response rates comparable to the present study (e.g. the National Survey of Sexual Attitudes and Lifestyles 2000 in the United Kingdom <qb.soc.surrey.ac.uk/surveys/nssal/nssalintro.html>, and HIV-Related Sexual Risk Behaviours/Beliefs, Knowledge and Behaviours Among High School Students in selected US cities in 1988 and also between 1991–1997). There is limited documented evidence that PLWAs or those at high risk of HIV infection are less likely to participate in surveys involving HIV testing (see FHI 2002). Nevertheless, it is important to mention here that in fact any response rate less than 100% in any survey, including even 75%, which is described as very good, has some bias. What is important is understanding the direction of the bias.

3.1.3 Re-interview of the sub-sample

A number of procedures were implemented during the two fieldwork Phases of the main survey to ensure compliance with the agreed methodology and the collection of quality information. An evaluation was conducted to ascertain the overall compliance with procedures and the quality and accuracy of the findings in the two phases of the survey.

The evaluation aimed to address the following aspects:

- Assess the sampling information and spatial location of the sampled units;
- The degree to which Phase I (i.e. the listing of household information at the selected sampling points) was accurately carried out;
- Whether interviewers in Phase II correctly identified and interviewed respondents;
- Whether the information collected in Phase II of the survey corresponds to information collected by the evaluation interviewers.

Specific households were visited once only during this re-interview survey. To minimise respondent fatigue, questionnaires administered to these respondents were as short as possible, and no attempt was made to obtain oral fluid samples. Due to time constraints, the re-interview teams were instructed not to make repeated visits in an attempt to find respondents who were not at home.

No attempt was made to re-interview respondents aged 12–14 years because the child sample was relatively small and it was deemed unnecessary.

Five distinct instruments were developed for use in the evaluation survey:

- A short questionnaire to validate the spatial location of an EA, the accuracy and utility of the maps and photography provided to the field teams, as well as to provide the opportunity to comment on other relevant aspects;
- A short questionnaire to be completed at each visiting point was included in the evaluation sample. By redoing the Phase I survey it was possible to check that the original information collected during Phase I of the survey corresponded to information collected by the evaluation team;
- A shortened version of the adult, youth and caregiver questionnaires which contained a selection of actual questions asked during Phase II of the main survey to cross-check for accuracy.

Fifty EAs were selected from the original 1 000 EAs for inclusion. These EAs represented all provinces and EA types. The selection of the evaluation EAs was done at the start of Phase II of the survey, and performance of the field teams in Phase II had no influence on the selection of EAs for the evaluation survey.

Approximately 35 interviewers operating in teams undertook the evaluation survey.

Conducting the evaluation survey

No specific fieldwork problems were encountered during the re-interview phase, although interviewers had to be cautious in allaying fears and suspicions about why they were re-visiting households. It was noted that there was a rumour in Mpumalanga and Limpopo provinces that a group of people were going around and infecting the population with HIV by means of saliva tests, and that they had been arrested. The rumour appeared to originate in Phase II of the survey where one team was taken to a police station to explain what they were doing when a specific community was unsure of the purpose of the survey. These two provinces had the lowest response rates in Phase II.

Four of the fifty EAs selected for the evaluation survey were not completed:

- One EA was never visited during Phase II. It served no purpose to revisit this EA;
- Two EAs could not be completed in time;
- The documentation of one EA could not be located to send to the evaluation team; The maps and visiting point questionnaires were only found later.

Results of the re-interview of the sub-sample

- Evaluation at the EA level: Experience in many surveys attests to difficulties encountered in sampling specific households and returning later to the same households during a survey. This applies especially to rural areas and informal settlements where lack of roads, identifiable boundaries and no addresses make it extremely difficult to check on fieldwork already completed. However, using the maps and photography produced for the HSRC master sample, in conjunction with GPS readings, the teams all managed to locate the selected EAs.

  The evaluation teams completed a short questionnaire to interrogate the accuracy of spatial boundaries, directions and other material that would assist a team of

interviewers to locate a specific Enumerator Area. In most cases the re-interviewers were able to find the visiting points enumerated by the Phase I fieldwork teams. Although a few of the nurse supervisors encountered difficulties in reading maps and operating GPS devices, this survey has demonstrated the potential of the methodology underlying the master sample to assist in conducting surveys of high quality.

- Evaluation of the listing of household particulars during Phase I: At each visiting point in the selected EAs, the evaluation interviewers completed a questionnaire that aimed to find out whether the Phase I interviewers visited the site, what the outcome of the visit was and whether the information they collected corresponded with that found by the evaluation interviewers. Upon completion these evaluation questionnaires were compared on a case-by-case basis with the original questionnaires. The results of this comparison were collated into a document that served as the basis for analysis.

  Table 9 summarises the findings of the evaluation survey at the visiting point level. At those visiting points where an interview was completed by the Phase I interviewers, the evaluation survey teams were able to confirm that in 72% of the cases the correct information was listed. At a fifth of the visiting points visited, the evaluation teams were not able to verify the data collected in Phase I due to non-contacts, respondents having moved, refusals to see the re-interview team etc. The evaluation team found minor inconsistencies in six percent of the completed Phase I listings. These related to wrong ages or, in one or two cases, the sex of the person being wrongly listed. There were also cases where a single member of the household was not included in the original listing. In only two percent of cases where an interview was completed the evaluation teams found major inconsistencies, such as the non-listing of household members, major problems with the composition of the household, or information provided by the Phase I interviewers which did not tally with the re-visit. It is possible that in some of these cases the evaluation team visited an incorrect point.

  Where the Phase I interviewers were not able to find respondents, the questionnaires were coded as non-contacts. Although in nearly 60% of these cases, the evaluation teams concurred with the interviewers' assessments (people being very hard to find, on holiday, etc), the evaluation teams were of the opinion that in about a quarter of cases listed by the Phase I interviewers as 'no-contacts', more could have been done to find the respondents.

  In nearly a fifth of those visiting points classified as uninhabited, the evaluation team made a different assessment. In many cases these were dwellings where people returned late or were frequently away.

  The evaluation survey also provided some estimates of the residential mobility of households. Nearly three percent of households had moved since the visit of the Phase I interviewers. Another aspect not quantified was the movement of individuals within households. In some of the informal areas between 10 and 20% of households reported the in- or out-migration of household members. This was also

Table 9: Comparing the outcome of Phase I fieldwork with the findings of the evaluation survey

PHASE I OUTCOME	RE-VISIT FINDING								
	Confirm – no inconsistency (%)	No contact – can't confirm (%)	Moved – can't confirm (%)	Refusal – can't confirm (%)	Minor inconsistency (%)	Major inconsistency (%)	Not done/no information provided (%)	TOTAL	n
Interview completed	72	8	2	5	6	2	5	100	325
Refusal	75	12	0	0	8	0	5	100	67
No contact/ No qualified person	58	16	0	0	24	0	2	100	45
Vacant dwelling	76	0	0	0	3	16	5	100	37

seen when the Phase II interviewers on occasion could not contact individuals who had moved. This has implications for follow-up studies.

On the whole however, the evaluation survey confirms the validity of the information supplied by the Phase I listing.

Non-participation in Phase I and possible reasons for this emerging from the re-interview of the sub-sample

A particular methodological concern was the level of respondent participation in Phase I, since that determined the profile of respondents selected for inclusion in the main survey. It is important to consider the reasons for non-response at Phase I, as this might have contributed to respondent bias in the overall study. During the evaluation survey more qualitative information was collected that shed some light on non-participation.

In order to generalise to Phase I of the study, it is important to know whether the response rates of the EAs selected for the evaluation survey were comparable to those of all EAs covered in Phase I. Table 10 compares the participation rates of Phase I and the evaluation survey.

Table 10: A comparison of participation rates at the visiting point level: Phase I and the sub-sample selected for the evaluation survey (percentages)

OUTCOME	TOTAL PHASE I*	EVALUATION SUB-SAMPLE*
Interview completed	73	69
Refusal	16	14
No contact/no qualified person at home	11	10
Not a dwelling/vacant dwelling	6	8

**Percentages rounded*

From Table 10 it appears that the EAs selected for the evaluation survey were similar to those in Phase I.

Less than half of potential white households were included in the listing of Phase I. Approximately three quarters of African, coloured and Indian households were interviewed in Phase I. It would be helpful to know what the reasons were for non-response, and how non-response contributed to bias in the findings of the survey.

It is essential to analyse the pattern of non-response. This is summarised below.

The three categories of non-response

- Not a dwelling/vacant dwelling. The methodology employed in the creation of the HSRC master sample used aerial photography to identify specific sampling points. From an aerial photograph it is difficult to assess whether a specific building is a dwelling, and if a dwelling, whether it is inhabited. This fact was anticipated when creating the master sample and the number of visiting points for inclusion in each EA was increased by 10%. In Phase I, 6% (n=694) of visiting points were classified as not inhabited. In general these cases will not contribute to bias (as there are no people living in the VPs). It should be borne in mind that up to a fifth of visiting points classified as uninhabited were indeed inhabited. That would mean that approximately one percent of visiting points were not included because they were difficult to find.

- No contacts/nobody qualified at home. In Phase I, 11.3% (n=1,237) of visiting points were classified as non-contacts. These persons could not be found because they worked late, were away or were not available for some other reason. A certain bias was introduced to the survey by the non-inclusion of these potential respondents. All surveys are confronted with this problem, but a balance has to be found between the costs incurred to find these hard-to-get respondents and the penalty (respondent bias) of not including them. During training, the Phase I interviewers were instructed to return at least three times on different days and times to find the respondents. In the evaluation survey it was found that not all Phase I interviewers adhered to the instructions. By being more meticulous, at least a quarter of these non-contact households could have been included in the sample It is interesting to note which households were not included in the Phase I listing on account of being away from home, mobile or hard-to-find.

In the EAs completed by the Phase I interviewers, inhabitants of white households were significantly harder to get hold of than other households. Nearly one fifth (18%) of potential white households were classified as non-contact cases, while 12% of African, 8% of coloured and 7% of Indian households were not included in the listing for similar reasons. Fourteen percent of households living in informal urban areas could not be contacted, while 12% of households in formal urban areas and tribal areas were not found.

- Refusals Overall 16% (n=1,692) of potential households refused to take part in Phase I. A variety of reasons were offered ranging from suggestions that they did not take part in surveys, to objections to the topic under investigation (HIV/AIDS) and a resistance to being tested for religious and other reasons. The reasons provided by those respondents who refused to be interviewed in Phase I do not allow for easy interpretation, although the topic of HIV/AIDS and the oral fluid testing might have contributed to possible non-response.

  Nearly a third (32%) of potential white households declined even to be listed in Phase I. Twenty percent of Indian households refused to take part while 17% of coloured and 9% of African households refused.

  Many researchers in South Africa find it exceedingly difficult to contact and convince households to take part in surveys, and reasons for refusals may include fear of crime, racial or language differences etc. Efforts were made to address some of these issues beforehand, but could not always be addressed in all areas.

  In comparing respondents and non-respondents we found no significant differences in variables related to HIV status.

3.1.4 Validity of HIV prevalence estimations

The calculated estimates of HIV prevalence take into consideration the full complexity of the sample by using the SAS procedure Surveymeans, and include the standard errors (SE), the coefficient of relative variation (CVr) and the 95% confidence limits. The HIV prevalence was estimated using ratio estimation. A ratio estimate is a biased estimate. As a rule of thumb the Kish guideline of CVr of < 20% is used as a reference threshold to determine the validity of prevalence estimates (Kish 1965). Furthermore, an estimate is imprecise if the confidence interval is too wide. For example, a CV value of 20% implies that its standard error is equal to 20% of the size of the estimate and the precision will be approximately equal to 40% of the size of the estimate. Consequently, if a CV value is relatively 'large', then the reliability (precision) of the estimate is relatively low. Based on this method, which is considered the most rigorous, the estimates of HIV prevalence should be considered valid for the majority of the findings. For whites, adults and youth living in rural areas or informal settlements, the imprecision of estimates are of substantive importance, and are at the statistical borderline. For this reason, the results in these latter subgroups should be treated with caution, and this is why CVs were also supplied to the reader. Finally, very high CV in some subgroups (Indian adults, white youth, white and Indian children, those children living in informal settlements and tribal areas) clearly indicate that the survey was not able to produce valid estimations of prevalence due to response biases. These are detailed in Appendices A1–A3.

This study also calculated the design effect (DEFF), that is, the loss of effectiveness when using cluster sampling, instead of employing random sampling procedure. DEFF is generally used to determine how large a sample size or confidence intervals should be to estimate reliably the population parameters. If a study is well designed the DEFFs usually range between 1 and 3, but they can be as high as 8 or even more (Schackman 2001). The smaller the value, the more reliable the sample estimate will be. In this study the design effects for HIV prevalence for each group are listed in Appendices A1–A3 and show that overall the study was well designed to permit reliable estimation of most findings.

3.1.5 Reliability of the HIV test results

For quality assurance purposes, the Medical Research Council examined the accreditation status, quality control and audit procedures used by the three laboratories. The results are described below and a longer discussion on the reliability of HIV testing on saliva and oral mucosal transudate specimens is included as Appendix B1.

Contract Laboratory Services (CLS)
CLS is a joint venture between the Wits Health Consortium and the National Health Laboratory Service (NHLS). It exists to provide customised, specialised diagnostic and research pathology services to both pharmaceutical and research industries. In the past 18 months CLS has performed more than 16 000 Orasure® tests for 8 different companies.

CLS laboratory accreditation

- CLS has full South African National Accreditation (SANAS) for all tests performed in the laboratory. See www.sanas.co.za for more details.
- This accreditation grants the laboratory competency certification against the ISO17025 quality standard.
- This accreditation covers HIV Oral Mucosal Transudate testing (using the combination of the Orasure® device and Vironostika Uniform II HIV-1/2 EIA).
- National Health Laboratory Service (NHLS) microbiology quality assurance programme for serology

CLS external laboratory audits

- CLS was subjected to a full laboratory audit by SANAS on 25 September 2002 (Previous SANAS audit was in 2001).
- The pharmaceutical company Bristol Myers Squibb (BMS) audited CLS in 2001. CLS provides laboratory testing for pharmaceutical clinical trials.
- CLS was audited in 2002 by the USA-based HIV Vaccine Trials Network (HVTN) to assess laboratory quality systems for HIV vaccine trials.
- Regular audits are undertaken by the quality assurance division of the NHLS

CLS HIV testing quality control
To assure quality control (QC) regarding Oral Mucosal Transudate testing the following are done:
Internal QC: Included in every batch of 89 samples are five negative controls scattered randomly in the 96 well ELISA plate, one pre-diluted Anti-HIV-1 positive control, and one positive Anti HIV-2 positive control. Internal QC is thus 8% of samples

- Proficiency testing: CLS participates in a proficiency testing programme set-up between MEDUNSA (Department of Microbiology), University of Natal (Department of Virology) and CLS. (No international external quality assurance program could be sourced.)

University of Natal Durban (UND), Department of Virology

The UND Department of Virology is part of the Nelson R. Mandela School of Medicine in Durban and does an average of 16 000 HIV tests per month, more than any other laboratory in the country. In addition, this laboratory is the only Centers for Disease Control (Atlanta, Georgia) accredited laboratory in South Africa for performing the 'detuned' HIV tests for determining HIV incidence.

UND LABORATORY ACCREDITATION

As the UND laboratory is currently moving from King Edward VIII hospital to the Inkosi Albert Luthuli Central Hospital, accreditation may not be sought until the move is complete after which SANAS accreditation will be sought.

UND EXTERNAL LABORATORY AUDITS

The National External Quality Assurance Scheme provides this for Microbiology (CPHL), Colindale, UK.

UND HIV TESTING QUALITY CONTROL

Internal QC includes running duplicate tests on a randomly selected 6% of specimens on a daily basis. In addition, the laboratory recently did a comparison of the sensitivity and specificity of HIV testing on saliva versus serum specimens (Perumal 1999). Paired saliva and serum specimens from 500 individuals were tested using ELISAs, and positive serum specimens were confirmed using the Western Blot. The sensitivity and specificity of the saliva tests were 100% and 99.3% respectively.

MEDUNSA, Department of Virology

MEDUNSA EXTERNAL LABORATORY AUDITS

The laboratory subscribes to the following Proficiency Programmes:

- NHLS QA programme for Microbiology (Quarterly for RPR and HIV);
- UK National External QA Scheme for Microbiology (Collingdale) (Quarterly for RPR and HIV).

MEDUNSA HIV TESTING QUALITY CONTROL

To guarantee the quality of laboratory procedures and assess the consistency of the results, the following additional specimens for quality control are recommended:

- Three duplicate specimens are forwarded to an independent laboratory and the results from the two laboratories are compared for consistency;
- Calibration of the systems is carried out as recommended by the suppliers' and manufactures' instructions and specifications on a daily basis;
- All instruments have a system of routine checks that are done before each batch is processed;
- Each kit includes a positive and negative control from the manufacturer. These are run with every sample batch to verify the results. In addition known samples are included as blinded random assessment;
- When new kits are being considered, a process of validation is followed to ensure equivalent result.

The survey laboratory quality control measures

In addition to the routine external and internal laboratory control measures listed above, an additional QC measure was implemented for the purposes of comparing interlaboratory consistency specifically for the study.

Thirty Orasure® devices were taken by the MRC and each of ten volunteers had three Orasures inserted, one after the other, into their mouths over a period of about 15 minutes to ensure that there was not excessive drying of the mouth. The triplicate Orasures were then each labelled with the same bar code and sent to the HSRC. From the HSRC, the triplicate Orasures were split up and one was sent to each of the three participating laboratories for analysis. The laboratories were blind as to which were the Orasures that were part of the study and which were sent as the QC process.

The MRC then obtained the results for the 30 Orasures from each laboratory and the results are shown in the table below. The most appropriate comparison to make is between the ratio of the OD and the cut off as presented in the 'Ratio' column. Overall, there was good agreement on the ODs between the laboratories.

Table 11: Results from the 10 QC Orasures sent to the three participating laboratories

	CLS			MEDUNSA			UND VIROLOGY		
Specimen	OD	Cut off	Ratio	OD	Cut off	Ratio	OD	Cut off	Ratio
1.	3.29	0.285	11.54	3.17	0.25	12.68	3.00	0.262	11.45
2.	0.11	0.285	0.39	0.28	0.25	1.12	0.06	0.262	0.23
3.	0.10	0.285	0.35	0.11	0.25	0.44	0.08	0.262	0.31
4.	1.26	0.275	4.58	2.58	0.25	10.32	1.44	0.262	5.50
5.	0.13	0.312	0.42	0.07	0.25	0.28	0.05	0.262	0.19
6.	0.11	0.285	0.39	0.09	0.25	0.36	0.08	0.262	0.31
7.	0.23	0.285	0.81	0.24	0.25	0.96	0.18	0.262	0.69
8.	0.13	0.285	0.46	0.08	0.25	0.32	0.07	0.262	0.27
9.	0.09	0.285	0.32	0.07	0.25	0.28	0.06	0.262	0.23
10.	0.12	0.285	0.42	0.08	0.25	0.32	0.07	0.262	0.27

We also attempted another approach to laboratory quality control whereby each laboratory sent panels of 15 specimens to each of the other two laboratories. The specimens were all obtained from the study participants. The process was that each laboratory would extract the oral fluids from the Orasure® devices by eluting the oral fluids from the sponge that had been inserted into the participant's mouth.

Whilst this method of circulating specimens is well established for blood specimens, the same is not the case with oral fluid specimens. With blood specimens, the actual blood is separated into aliquot tubes, which contain the same stabilising chemicals as the original tube. However, with oral fluids extracted from the stabilised Orasure device, there is no data on how stable the resulting fluid is. We found evidence that the fluid had deteriorated in transit to the other laboratories in that the optical density (OD) readings in the laboratories that were sent the specimens were consistently below the readings of the

sending laboratory. For these reasons we did not consider this a valid form of QC and the results are therefore of no use.

In conclusion, quality control clearly confirms the validity of HIV results obtained in this study.

3.2 National HIV prevalence

Data on national level estimates of HIV prevalence are based on weighted data to correct for differential sampling weights and response rates. Analyses comparing HIV prevalence by sex, age, race, locality type and provinces were performed using a Chi-square test on weighted data. The computer software STATA, which takes into account sampling stratification and weighting of individual data, was used for these computations.

In this report reference is made to racial variables in analysing various aspects of HIV. The rationale for this is that historically, disparities in wealth, education and access to all social services have existed along racial lines. In a post-apartheid context, analysis by race allows for continued assessment of disparities in health, quality of life and development that may be a product of a racially divided history.

Analysis is also conducted within various age bands. In this report, persons younger than 14 years are referred to as children, and analysis is conducted using the age group 2–14 years. Persons aged 15–24 years are considered to be youth, and this definition is drawn from that agreed upon at the UN General Assembly Special Session on HIV/AIDS (UNGASS), which allows for uniform monitoring across countries. The age range 15–49 years is used to permit comparison with UNAIDS statistics.

All HIV prevalence ratios are presented with confidence intervals. This is because the true population estimates lie somewhere in between the lower and the upper estimates. These figures should also be read jointly with Appendices A1–A3, which provide additional detail that will assist readers in assessing the reliability of the findings. These statistics are response rates, standard errors of estimates of the HIV prevalence, the coefficient of relative covariation and the design effect (DEFF).

3.2.1. Overall HIV prevalence

The tables below present HIV prevalence estimates for South Africa and include estimates of the total number of people living with HIV/AIDS in 2002. Table 12 shows the estimated HIV prevalence in the general population of South Africa. The findings show that the prevalence of HIV amongst persons aged two years and older is estimated at 11.4%.

The national HIV prevalence differs substantially between males and females with 9.5% among males and 12.8% females being HIV positive.

Table 12: Overall HIV prevalence by sex and race, South Africa 2002

SEX & RACE	n	HIV POSITIVE (%)	95% CI
Total	**8428**	**11.4**	**10.0–12.7**
Male	3772	9.5	8.0–11.1
Female	4656	12.8	10.9–14.6
African	5056	12.9	11.2–14.5
White	701	6.2	3.1–9.2
Coloured	1775	6.1	4.5–7.8
Indian	896	1.6	0–3.4%

People living with HIV/AIDS are found in every race group in South Africa, although there are differences in the observed prevalence within race groups. The observed national prevalence among Africans is significantly higher than among other race groups.

Table 13 presents HIV prevalence by province. Based on the findings, Free State, Gauteng and Mpumalanga have the highest HIV prevalence in South Africa, while KwaZulu-Natal ranks fourth although there are no statistically significant differences among the four provinces. The Western Cape and Northwest have similar levels of prevalence. Eastern Cape has the lowest prevalence.

Table 14 presents estimated HIV prevalence by area of residence, that is, locality type. The study found that HIV prevalence varied substantially by locality type. People living in informal urban areas were significantly more likely to be HIV positive than those living in urban formal areas. Those living in urban formal areas had a significantly higher

Table 13: Overall HIV prevalence by province, South Africa 2002

PROVINCES	n	HIV POSITIVE(%)	95% CI
Total	**8428**	**11.4**	**10.0–12.7**
WC	1267	10.7	6.4–15.0
EC	1221	6.6	4.5–8.7
NC	694	8.4	5.0–11.7
FS	540	14.9	9.5–20.3
KZN	1579	11.7	8.2–15.2
NW	626	10.3	6.8–13.8
GP	1272	14.7	11.3–18.1
MP	550	14.1	9.7–18.5
LP	679	9.8	5.9–13.7

prevalence when compared to residents of farm and tribal areas although the differences were not large enough to reach statistical significance.

Table 14: Overall HIV prevalence by locality type, South Africa 2002

LOCALITY TYPE	n	HIV POSITIVE (%)	95% CI
Total	**8428**	**11.4**	**10.0–12.7**
Urban formal	5098	12.1	10.3–14.0
Urban informal	841	21.3	16.2 –26.5
Tribal	1906	8.7	6.5 –10.9
Farms	583	7.9	4.8 –11.1

3.2.2 HIV prevalence among children aged 2–14 years and older

Table 15 presents HIV prevalence data by age. The results indicate that the epidemic seriously affects South African children aged 2–14 years. The prevalence among girls and boys was estimated to be 5.2% (95% CI=3.2–7.3%) and 5.9% (95% CI-2.8–8.9%) respectively. Due to relatively small sample numbers, the prevalence for girls should be interpreted with caution. Among African children the HIV prevalence is 5.4% (95% CI=3.3–7.6%). Based on the observed coefficient of relative covariation, it is not possible to reliably estimate child HIV prevalence for other race groups, locality type or province. These findings are listed in Appendices A1–A3.

Further examination of Table 15 reveals that HIV prevalence increases with age. These age differences are discussed further below.

Table 15: HIV prevalence by age group, South Africa 2002

AGE	n	HIV POSITIVE (%)	95% CI
Total	**8428**	**11.4**	**10.0–12.7**
Children (2–14 yrs)	2348	5.6	3.7–7.4
Youths (15–24 yrs)	2099	9.3	7.3–11.2
Adults (=>25 yrs)	3981	15.5	13.5–17.5

3.2.3 HIV prevalence among persons aged 15–24 years

Table 16 shows HIV prevalence amongst youth. Although there were no sex differences among children, this is not so among the youth. Female youth have a higher HIV prevalence compared to male youth.

Table 17 summarises HIV prevalence among youth by race. African youth had the highest observed prevalence of HIV infection. The prevalence for coloured youth was

Table 16: HIV prevalence among persons aged 15-24 years by sex, South Africa 2002

SEX	n	HIV POSITIVE (%)	95% CI
Total	2099	9.3	7.3–11.2
Male	976	6.1	3.9–8.3
Female	1123	12.0	9.2–14.7

Table 17: HIV prevalence among persons aged 15-24 years by race, South Africa 2002

RACE	n	HIV POSITIVE (%)	95% CI
Total	2099	9.3	7.3–11.2
African	1320	10.2	7.9–12.5
White	129	3.2	0–7.5
Coloured	427	6.4	4.5–8.4
Indian	223	0.3	0.2–0.3

second highest. The prevalence for white and Indian youth cannot reliably be estimated from this study, mainly due to high non-response rates.

Figure 6 shows HIV prevalence by province among youth. The vertical lines shown on the graph show confidence intervals around the estimates. Not many differences were observed in HIV prevalence among youth living in different provinces.

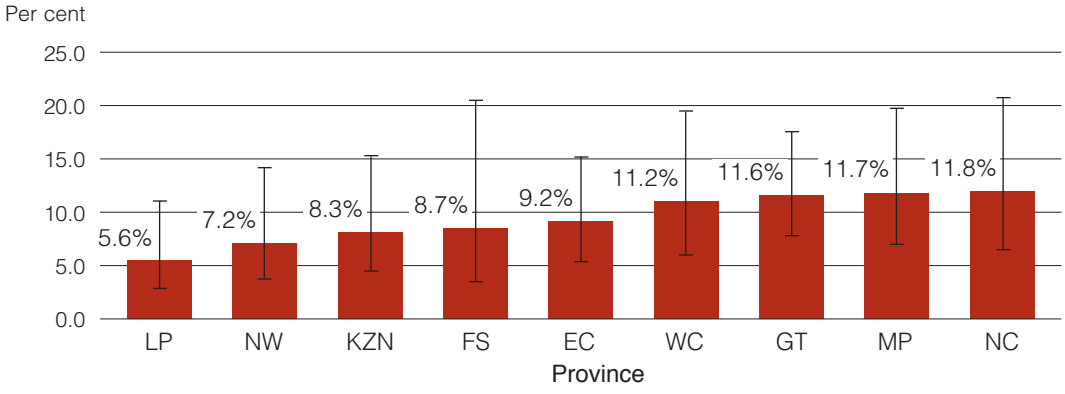


Figure 6: HIV prevalance among persons aged 15-24 by province, South Africa 2002

Table 18 presents HIV prevalence amongst youth by locality type. Major differences were found amongst various types of locality with youth living in urban informal areas having significantly higher HIV prevalence than youth living in urban formal areas.

Table 18: HIV prevalence among persons aged 15-24 years by locality type, South Africa 2002

LOCALITY TYPE	n	HIV POSITIVE (%)	95% CI
Total	2099	9.3	7.3–11.2
Urban formal	1230	9.3	6.6–12.0
Urban informal	197	20.2	12.3–28.1
Tribal	524	7.0	3.9–10.1
Farms	148	8.6	1.0–16.1

3.2.4 HIV prevalence among persons aged 15–49 years

Figure 7 presents the observed HIV prevalence among persons aged 15–49 years to permit comparison of South Africa with other countries. The results show that 15.6% tested positive. However the burden of this epidemic is uneven between sexes. Women have much higher HIV prevalence than men and these differences are statistically significant.

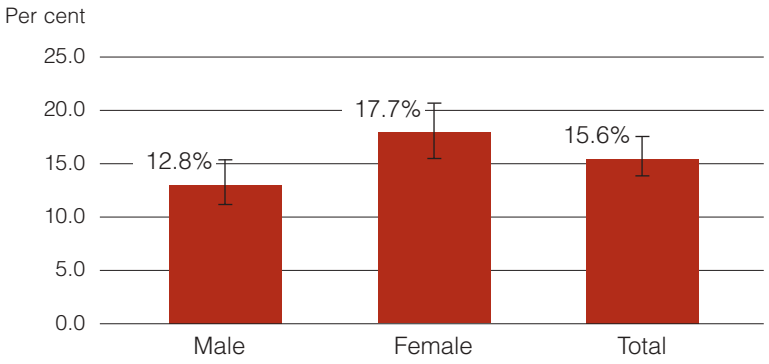


Figure 7: HIV prevalence among adults aged 15-49 years by sex, South Africa, 2002

Figure 8 shows observed HIV prevalence among persons aged 15–49 years by race. Africans have the highest HIV prevalence compared with other race groups. The prevalence among white and coloured persons is however also high. It is important to note that the observed HIV prevalence for whites has wider confidence intervals and this is largely due to a low response rate among whites. The same can be said of the Indian population.

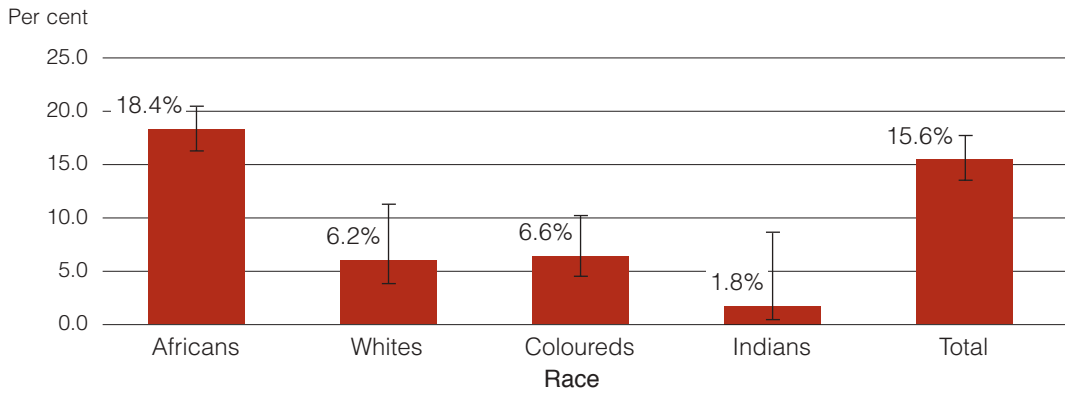


Figure 8: HIV prevalence among adults aged 15–49 years by race, South Africa 2002

Figure 9 shows HIV prevalence among the nine provinces. When prevalence was computed by province, the results show Mpumalanga, Gauteng and Free State to have the highest HIV prevalence among adults aged 15–49 years. However, Mpumalanga had a lower response rate and a wider confidence interval than the other two provinces. The Northern Cape and Eastern Cape provinces were found to have the lowest HIV prevalence among persons aged 15–49 years. The observed prevalence in Kwazulu-Natal is lower than that observed in Mpumalanga, Gauteng and Free State.

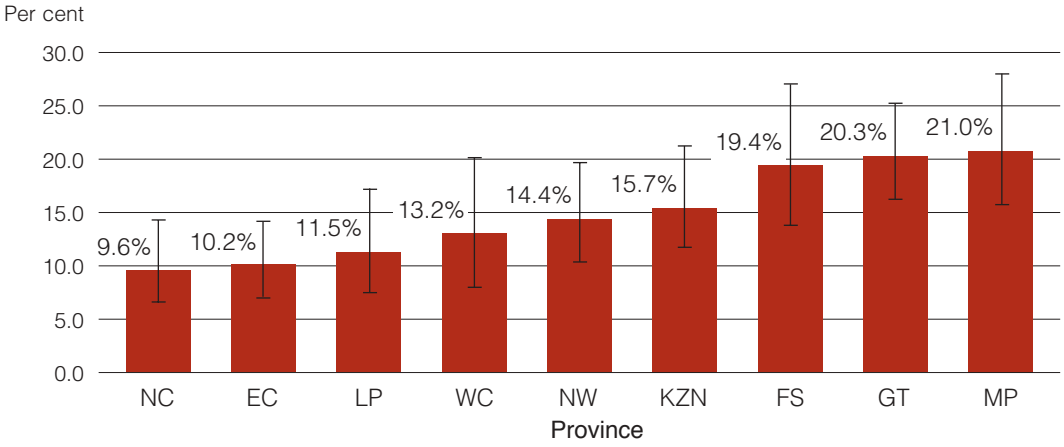


Figure 9: HIV prevalence among adults aged 15–49 years by province, South Africa 2002

From Figure 10 it is apparent that living in urban informal areas is a determinant of HIV infection among adults aged 15–49 years.

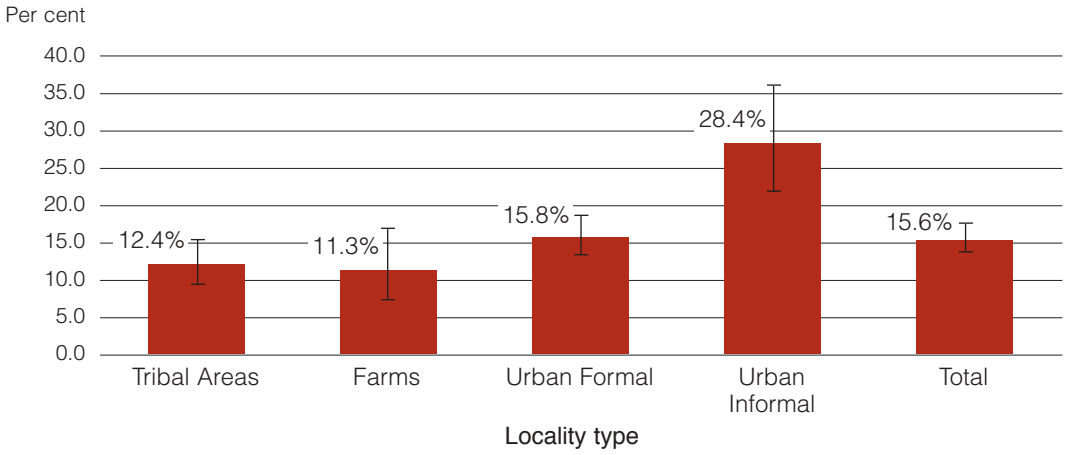


Figure 10: HIV prevalence among persons aged 15–49 years by locality type, South Africa 2002

3.2.5 HIV prevalence among persons aged 25 years and older

Table 19 shows HIV prevalence by sex amongst persons 25 years and older. While large differences were observed earlier in HIV prevalence between male and female youth, the prevalence amongst persons 25 years and older was less marked.

Table 19: HIV prevalence among persons aged 25 years and above by sex, South Africa 2002

SEX	n	HIV POSITIVE (%)	95% CI
Adults (=>25 yrs)	3981	15.5	13.5–17.5
Male	1609	14.4	11.6–17.1
Female	2372	16.2	13.6–18.8

Table 20 presents HIV prevalence amongst those aged 25 years and older by race. African adults have higher prevalence of HIV than other race groups. The HIV prevalence for white adults should be interpreted with caution given the observed low coefficient of variation and low response rate (see Appendix A2).

Table 20: HIV prevalence among persons aged 25 years and above by race, South Africa 2002

RACE	n	HIV POSITIVE (%)	95% CI
Total	8428	11.4	10.0–12.7
African	2318	18.8	16.2–21.3
White	427	5.7	2.7–8.7
Coloured	812	6.7	4.4–8.9
Indian	424	2.3	1.5–3.1

Table 21 shows HIV prevalence for adults by locality type. The study found that persons living in informal settlements have much higher HIV prevalence than those living elsewhere. The next highest HIV prevalence was in adults living in formal urban areas. In general, urban areas had higher prevalence than rural areas.

Table 21: HIV prevalence among persons aged 25 years and older by locality type, South Africa 2002

LOCALITY TYPE	n	HIV POSITIVE (%)	95% CI
Adults*	3981	15.5	13.5–17.5
Urban formal	2478	15.7	12.7–18.6
Urban informal	419	28.6	21.6–35.6
Tribal	789	12.8	9.5–16.0
Farms	295	9.5	5.7–13.2

* =>25 years

3.2.6 HIV prevalence by selected demographic and risk factor variables for persons 15 years and older

This part of the analysis excludes children because the overwhelming majority are not sexually active and hence behavioural risk variables are not applicable to this group. For this reason, instead of analysing data on 8 428 persons who provided specimens for HIV test, this section reports on weighted data collected from the 6 086 youth and adults.

Among these 6 086 participants who had valid HIV results, the prevalence was 13.6% (95%CI: 12.1–15.2%).

The data shows a significant difference between the HIV prevalence for men (11.5%) compared to women (15.0%, p = 0.01) for the whole sample. For Africans the difference

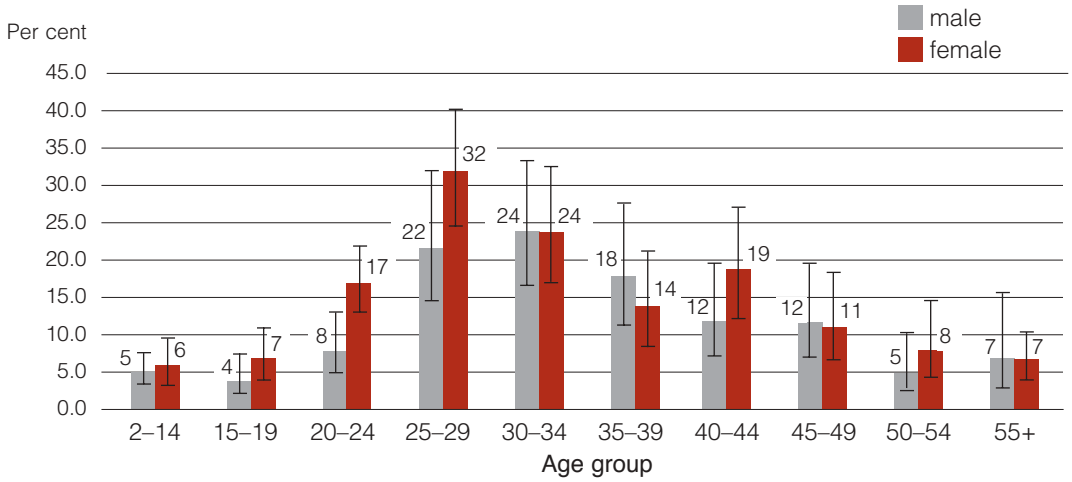


Figure 11: Prevalence of HIV by sex and age, South Africa 2002

was 13.5% for men compared to 17.6% for women (p = 0.02). For the other races there was no significant difference according to the sex of the respondent.

Figure 11 shows the prevalence of HIV for men and women separately by five-year age bands.

Table 22 shows the HIV prevalence levels for women by five-year age groups and compares the results to the levels reported by the Department of Health (DOH) for the 2001 antenatal survey (the latest available statistics). The reason for making the comparison of Africans is because this group makes up over 85% of the sample from the annual antenatal survey.

Table 22: HIV prevalence by age amongst women surveyed in 2002 compared with pregnant women surveyed by Department of Health in 2001

Age groups		Women (15–49)		African women (15–49)		2001 DoH Survey	
	%	%	95% CI	%	95% CI	%	95% CI
15 to 19	5.9	7.3	(4.7–11.3)	7.5	(4.5–12.0)	15.4	13.8–16.9
20 to 24	13.2	17.1	(12.9–22.3)	19.1	(14.2–25.0)	28.4	26.5–30.2
25 to 29	28.3	32.0	(24.8–40.1)	38.6	(30.0–48.1)	31.4	29.5–33.3
30 to 34	24.1	24.1	(17.3–32.5)	29.7	(21.1–39.9)	25.6	23.5–27.7
35 to 39	15.6	13.8	(8.7–21.1)	17.5	(10.9–26.8)	19.3	17.0–21.5
40 to 44	16.4	19.0	(12.8–27.2)	22.5	(14.9–32.5)	9.1	6.2–11.9
45 to 49	11.5	11.2	(6.5–18.7)	11.3	(5.6–21.3)	17.4	4.3–31.4
Total	15.6	17.7	(15.2–20.4)	20.7	(17.7–24.0)	24.8	23.6–26.1

When a comparison is made between all women and pregnant women surveyed through the DOH antenatal care survey, the latter have much higher rates for all five-year age groups between 15 and 39 years, and 45 and 49 years. However, when the most appropriate comparison is made, different results emerge. The comparison between African women and pregnant women surveyed by the Department of Health shows the HIV prevalence to be higher in the latter sample for those aged 15–19 and 20–24 years and much lower in the 40–44 year age group.

This study identified those women who were pregnant in the last twelve months (n=244) in the household survey, and found that 24% (CI:15.8–34.8%) were HIV positive, a finding similar to that obtained by the Department of Health in 2001 (24.8%, CI:23.6–26.1%). Because of the small number of pregnant women in the household survey, the design effect was 4.6 leading to wide confidence intervals.

3.2.7 HIV prevalence by measures of socio-economic and educational status

There was no significant difference in the HIV prevalence among those who reported that they were working (14.2%) and those not working (12.1%) (p=0.7).

Table 23 shows that when the socio-economic status of the home is categorised on a scale ranging from having not enough money for food and clothes, up to having disposable income for luxuries, there is a decrease in HIV prevalence from the poorer to richer homes when all participants are included. This means there is a negative correlation between HIV and socio-economic status. However, this trend disappears when only Africans are considered, as in this group there is no discernable trend.

Table 23: Prevalence of HIV by a measure of disposable household income for persons age 15 years and older by race, South Africa 2002

INCOME 95% (CI)	WHOLE SAMPLE 95% (CI)	AFRICAN 95% (CI)	WHITE 95% (CI)	COLOURED 95% (CI)	INDIAN
Not enough money for basics	13.9 (11.9–15.9)	14.5 (12.4–16.7)	6.2 (0.0–15.4)	7.6 (2.6–12.7)	1.9 (0.0–4.5)
Enough for basics, short for others	14.0 (11.6–16.4)	16.1 (13.2–19.0)	6.4 (0.0–13.1)	4.4 (2.6–6.2)	3.7 (0.0–9.8)
Enough for most important things	6.5 (3.7–9.3)	9.4 (3.7–15.1)	3.7 (0.9–6.4)	7.8 (1.4 –14.1)	0.5 (0.0–1.3)
Some money for extras	5.0 (1.8–8.1)	10.3 (0.0–20.7)	4.6 (0.7–7.1)	2.7 (0.0–7.1)	0.0

Table 24 summarises the relationship between HIV and education by the race of the respondent. When using the sample of persons aged 15 years and older and comparing the HIV prevalence between differing levels of education, there are no significant differences between those with no schooling, those with some schooling and those who have matriculated, but among the participants with a tertiary degree the prevalence of

Table 24: Prevalence of HIV of persons 15 years and older by educational level and by race, South Africa 2002

EDUCATION	15 YEARS + % (CI)	AFRICAN % (CI)	WHITE % (CI)	COLOURED % (CI)	INDIAN % (CI)
No school	8.3 (4.9–11.7)	8.7 (5.0–12.4)	0.0	5.2 (0.2–10.1)	0.0
Primary school	12.1 (9.7–14.5)	12.6 (10.0–15.3)	10.7 (0.0–32.2)	8.3 (3.9–12.7)	1.2 (0.0–3.7)
High school	14.9 (12.5–17.3)	17.2 (14.4–20.1)	7.7 (1.5–13.9)	5.1 (2.3–7.9)	0.8 (0.0–1.9)
Matric	15.3 (11.6–19.0)	21.1 (15.7–26.5)	4.4 (0.8–8.0)	6.4 (0.0–13.5)	3.0 (0.0–7.9)
Tertiary education	6.5 (3.4–9.5)	10.2 (4.6–15.9)	3.6 (0.4–6.8)	2.7 (0.0–6.4)	0.3 (0.0–0.8)

HIV was significantly lower than the rest (p=0.004). However, this pattern is reversed when only Africans are considered, that is, there is a significant increase in HIV prevalence with increasing levels of education (p=0.01).

3.2.8 HIV and history of diagnosis of sexually transmitted infections (STIs)

A total of 165 participants (out of 7 084 who completed questionnaires), that is, 2.3% admitted to being diagnosed with at least one STI during the last three months. When weighted data are used, 2.6% of participants had at least one STI during the last three months with the prevalence among men being 3.9% (95% CI:2.8–5.4%) and among women 1.7% (95% CI:1.2–2.4%).

Table 25 displays HIV prevalence by history of sexually transmitted infections and shows that despite the relatively low reporting levels, there is a strong association between HIV and STIs.

Tables 26 and 27 show the distribution of STIs by race and locality type. STI prevalence levels are highest among Africans followed by coloureds and whites but the differences are not statistically significant. No major differences were observed in the prevalence of self-reported STIs from people living in tribal areas, farms or urban formal areas, but there was a significantly higher prevalance of STIs among those living in informal areas.

Table 25: Prevalence of HIV by self-reported history of having had a sexually transmitted infection, South Africa 2002

	STI PRESENT		NO STI	
	%	95% CI	%	95% CI
Diagnosed with an STI in last 3 months	39.9	23.2–57.3	13.2	11.7–14.9
Sores/ulcers on genitals in last 3 months	40.2	23.9–59.0	13.3	11.8–14.9
Abnormal penile discharge in last 3 months	24.9	11.8–45.0	14.5	12.0–15.1

(Note: numbers of men with urethral discharge too few for meaningful analysis)

Table 26: Prevalence of self-reported STIs by race, South Africa 2002

RACE	STI PREVALENCE %	95% CI
African	3.1	2.4–4.0
White	0.6	0.1–3.0
Coloured	1.6	0.8–2.9
Indian	0.4	0.1–0.9

Table 27: Prevalence of self-reported STIs by locality type, South Africa 2002

LOCALITY TYPE	PREVALENCE %	95% CI
Tribal Area	2.0	0.16–3.2
Farm	2.6	1.1–6.1
Urban Formal	2.3	1.6–3.2
Urban Informal	6.5	5.0–10.2

Due to small numbers no further analysis by province is possible.

In addition to determining the prevalence of self-reported STIs, data was collected on the extent of awareness regarding where to access treatment. It was found that most people knew of the places where they could go for treatment of STIs (79%). About 10% of the respondents who knew of these services had used them and the majority of them indicated that the service provided was satisfactory (92.7%).

Logistic regression

With a variety of demographic and other factors influencing the HIV prevalence levels, it is appropriate to use logistic regression techniques in order to determine which explanatory variables are independent predictors for HIV status. Table 28 uses the weighted data and lists the demographic and behavioural variables that remained significant in the model and provides the odds ratio (OR), 95% confidence intervals and the p values for the whole sample.

The most important demographic predictors of HIV are: race, age, sex of respondent, locality type, and province of residence. Education and economic status were not significant independent predictors of HIV status, but history of an STI was associated with a higher likelihood of being HIV positive.

Being a resident in a rural area (tribal areas and farms) means that an individual is significantly less likely to be HIV positive than if resident in an urban area regardless of other factors such as race or socio-economic status. Province of residence also remains an independent predictor of HIV status with those living in the WC, EC or NC having significantly less likelihood of being HIV infected than persons living in Gauteng, Free State or Mpumulanga.

3.2.9 Discussion

The majority of findings in this study confirm trends in existing data. However, there are findings that differ from existing studies. The study also generated new findings, and these may require further validation and/or in-depth analysis.

Confirming what is known

- National HIV prevalence: This household survey supports the finding that HIV is a generalised epidemic in South Africa. This is based on the estimated national HIV

Table 28: Logistic regression of selected demographic and behavioural variables and HIV status using the unweighted data for the whole sample

	ODDS RATIOS AND CONFIDENCE INTERVALS		
Age	OR	95%CI	p value
50+	0.4	(0.3–0.6)	<0.001
25–49	1.0	(0.7–1.4)	0.9
<25	1.0		
Locality type			
farm	0.6	(0.4–1.0)	0.04
tribal area	0.6	(0.4–0.8)	0.004
urban/inform	1.4	(1.0–2.0)	0.06
urban/formal	1.0		
Sex of respondent			
female	1.4	(1.1–1.9)	0.004
male	1.0		
Household income			
luxuries	0.6	(0.3–1.2)	0.1
most	0.5	(0.3–1.0)	0.06
enough	1.04	(0.8–1.4)	0.8
not enough	1.0		
Marital status			
married	0.9	(0.6–1.2)	0.4
alone	1.0		
Race			
Coloured	0.4	(0.2–0.6)	<0.001
Indian	0.1	(0.03–0.4)	0.001
White	0.4	(0.2–0.8)	0.006
African	1.0		
Prevalance			
High	1.5	(1.1–2.2)	0.02
Mid	1.4	(1.0–2.0)	0.05
Low	1.0		
STI			
yes	2.6	(1.4– 4.8)	0.003
no	1.0		

prevalence of 11.4% of persons who are living with HIV/AIDS. If the response rate was 100%, which is never the case in any study on HIV/AIDS, perhaps different findings may have been observed. This study has been conservative in its computation of response rates. Had non-contacts in this study been excluded from the denominator as done in other studies (National Survey of Sexual Attitudes and Lifestyles 2002) the global response rate would have been 96.7% for all interviews, and 81.8% for HIV testing. The response rates for each prevalence estimate are outlined in Appendices A1–A3. This survey did not assess the following groups: children younger than 2 years old who may have been infected through mother to child transmission (estimated at 83 500), as well as persons living in institutions such as prisons, military barracks and boarding schools. For this reason, the estimate made may be underestimating HIV prevalence. A plan is underway to model study findings drawing on information from smaller studies focusing on these specific populations. The 11.4% prevalence estimated in the household survey is similar to the 11.2% (4.84 million) estimated through modelling by the Department of Health. The UNAIDS estimates of five million PLWA and 20.1% of persons in the 15–49 age group HIV positive for 2001 are much higher than those observed in this study. This study observed that 15.2% (CI: 13.9–17.5%) of persons in the same age range were HIV positive.

- HIV prevalence by age and sex of respondent: The age and sex distribution of HIV infection follows the pattern found in other studies, that is, prevalence levels rise more quickly in women and then decrease with age whereas with men the peak prevalence levels occur at an older age. The logistic regression analysis confirms that both age, in particular being between 25 and 49 years, and being female increases the likelihood of a person being HIV positive. Various reasons have been suggested for the sex differences. One hypothesised reason is that younger women are more biologically vulnerable than men because of immature genital tracts and/or as a result of risky sexual practices (Glynn 2001;Tanfer & Aral 1996). Other studies have shown that women tend to have sex with men who are older than themselves (the so-called 'sugar daddy' phenomenon) and this is supported in this study as 8% of women aged 15 to 24 have partners who are between 11 to 25 years older than themselves (compared to 2% of men) and a further 22.4% of women have partners between 6 and 10 years older (compared to 3.6% of men). It is therefore appropriate to target young women as especially vulnerable and not to ignore older people in prevention campaigns.

  The finding that there are more women infected than men in the 40 to 44 year old group is not readily explained. This may be partly due to a 'cohort effect' as the epidemic matures and people infected in their youth are now moving into older age bands with a higher mortality amongst men. However, the design of this study does not permit this analysis.

- HIV prevalence by race in South Africa: For the first time, South Africa has HIV prevalence estimates by race, a statistic essential for monitoring progress in improving the health status and quality of lives in a post-apartheid society. The finding that Africans have a higher estimated HIV prevalence [12.9% (11.2–14.5%)] than whites [6.2% (CI 3.1–9.2%)] and coloureds [6.1% (CI: 4.5–7.8%)] probably reflects historical factors. Higher proportions of Africans are more likely than other

races to be found in informal settlements, where HIV prevalence is highest. Factors contributing to this include labour migration, mobility, and relocation. Racial disparities in HIV prevalence have been observed in countries such as the United States of America, where African Americans have higher HIV prevalence than white Americans (CDC 2002: <http://www.thebody.com/cdc/factrace.html>).

Although Africans have the highest estimated HIV prevalence, whites and coloureds also have high estimated HIV prevalence. The estimated HIV prevalence among whites in South Africa is much higher than that observed in predominantly white societies, for example in the USA, Australia, France and UK, which have HIV prevalence less than 1% (UNAIDS 2002). The HIV prevalence among whites and coloureds clearly indicates that a dynamic epidemic is occurring in these groups, and they should be consciously incorporated into HIV prevention efforts.

- HIV PREVALENCE DERIVED FROM ANTENATAL DATA: This study calculated the HIV prevalence among women who reported being pregnant in the 12 months before the study (n=244) and found that 24% (CI: 15.8–34.8%) were HIV positive, a finding similar to the Department of Health's survey of clinics, which found 24.8%. As expected both the household survey and the Department of Health's antenatal survey observed much higher HIV prevalence among pregnant women than in the general population. Household data thus usefully informs interpretation of antenatal data.

  Until now, the Department of Health has used extrapolations from data collected from pregnant women to estimate HIV prevalence in the general population. Antenatal data provided the following population best estimates for 2001: (a) that 83 581 children were infected with HIV by their mothers, (b) 2.09 million men were infected, (c) 2.51 million women were infected, adding to the total estimate of 4.74 million adults. With the addition of 83 581 children, it was estimated that 4.8 million South Africans were living with HIV/AIDS at the end of 2001. Estimates were made using modelling techniques that assumed that (a) the male infection rate is equal to 85% of the rate of infection among women, (b) the number of births is equal to the number of pregnant women (c) that 35% of children born to HIV infected women will become HIV positive, and that (d) the HIV positive rate in pregnant women will be the same as the rate in non-pregnant women. From these assumptions, it appears that the antenatal model is likely to overestimate the HIV prevalence in South Africa.

  This study found that (a) the infection rate among men is 74% of that of women and HIV prevalence in pregnant women is not equal to that of non-pregnant women i.e. 24.0% and 14.5% respectively. This study provides useful input into modelling national prevalence data from antenatal data.

  The DoH antenatal data for 2001, when compared by age bands fits reasonably well with the results of this study. We found a statistically significant lower HIV prevalance among 15 to 24 year olds, which is to be expected. This is because not all young women are sexually active, as opposed to pregnant women in the antenatal data, who by definition are practising unprotected sex. Overestimation of the HIV prevalence in this age group is a known bias in antenatal studies.

When comparing women in this study with pregnant women in the anenatal survey who are older than 24 years, there is no particular trend, and the confidence intervals overlap among all age bands, except among the 40–44 year olds. The high prevalence among those aged 40–44 years in this study is anomalous, and should be regarded as suspiciously high.

- HIV prevalence in rural areas: HIV prevalence is lowest in rural areas and highest in urban areas, particularly in urban informal settlements as reported in this study. This is the first national study that examines HIV prevalence in a representative sample of South Africa's rural areas and compares the results with a representative sample in urban areas.

  The lower HIV prevalence in tribal areas and farms, when compared to the prevalence ratios in urban formal areas and in urban informal settlements, suggests that increased efforts are needed to keep prevalence lower in rural areas, while parallel efforts are needed in urban areas to reduce new infections. Residents of informal settlements are known to be more mobile, and thus need targeted interventions.

- Relationship between HIV and STIs: Sexually transmitted infections are a co-factor for HIV transmission. Research has shown that the presence of genital ulcer disease and of some non-ulcerative STIs enhances the transmission of HIV (Cohen 1997; Flemming & Wasserheit 1997; Harrison et al. 1998; Hurwitz 1998, Wasserheit 1992). Given the strong association between STI and HIV infection, the control and prevention of STIs may be critical in the prevention of HIV. The prevalence of STIs in this study was determined by self-reporting only, with no biological markers being obtained. In comparison to other recent studies in South Africa, the self-reporting levels among adults reported here (2.6% with symptoms in last 3 months) are low. In the 1998 DHS survey 12% of adults reported STI symptoms in the last 3 months and in a study in KZN the level was 10% (Colvin et al. 1998). Further research is required to understand why the prevalence of self-reported STIs is low in this study. However, the decrease in self-reported STIs may be real. The increased use of condoms and other improvements in sexual behaviour reported in this study may be lowering the incidence of STIs. This theory is supported by the substantial decreases in syphilis as measured by the annual antenatal survey.

  Nevertheless, in spite of the small number of participants admitting to STI symptoms, these participants had a substantially and significantly increased chance of being HIV positive. In addition, because of the association between STIs and HIV, it is not surprising that in this study the prevalence levels of self-reported STIs follow a similar pattern to the distribution of HIV, i.e. higher among Africans and particularly high in the informal settlements. The logistic regression analysis confirms that STIs are associated with HIV.

  Whether or not the STI epidemic is driving the HIV epidemic or whether it is 'piggy-backing' on the same risk factors cannot be established from this survey. However, whatever the relationship, informal areas need special targeting for both STI reduction and HIV prevention and care. Meanwhile, the window of opportunity exists in rural areas to prevent both the STI and HIV epidemics from reaching the

same proportions as currently exist in urban areas. There is a need for an aggressive strategy in this regard.

Differing findings

- HIV PREVALENCE IN KWAZULU-NATAL: This study observed that KwaZulu-Natal appears not to have the highest HIV prevalence in South Africa. Instead it ranked fourth highest, lower than Free State, Gauteng and Mpumalanga. However, it must be emphasised that the confidence intervals among many of these provinces overlap. The Department of Health's antenatal data show KwaZulu-Natal to have an HIV prevalence that is much higher than any other province by a much wider margin than in this study.

  There are several possible reasons for the observed discrepancies. First, the most plausible explanation for the differences may be sampling: all of the 36 KwaZulu-Natal antenatal sentinel sites are found along major or main roads (Figure 12). Transport routes are known to have much higher HIV prevalence. This study sampled respondents from rural and urban areas throughout KwaZulu-Natal. The role of differential response rates in the household survey in explaining the low prevalence of HIV in KwaZulu-Natal may need further investigation.

  Researchers investigating factors accounting for differences in HIV seroprevalence in the rural Rakai district in south western Uganda concluded that seroprevalences of HIV suggest spread of infection from main road trading centres, through intermediate trading villages, to rural agricultural villages (Wawer et al. 1991). Whilst the weighted seroprevalence of HIV for the district was 12.6%, seroprevalence was highest in main road trading centres (men 26%, women 47%), intermediate in rural trading villages on secondary roads (men 22%, women 29%), and lowest in rural

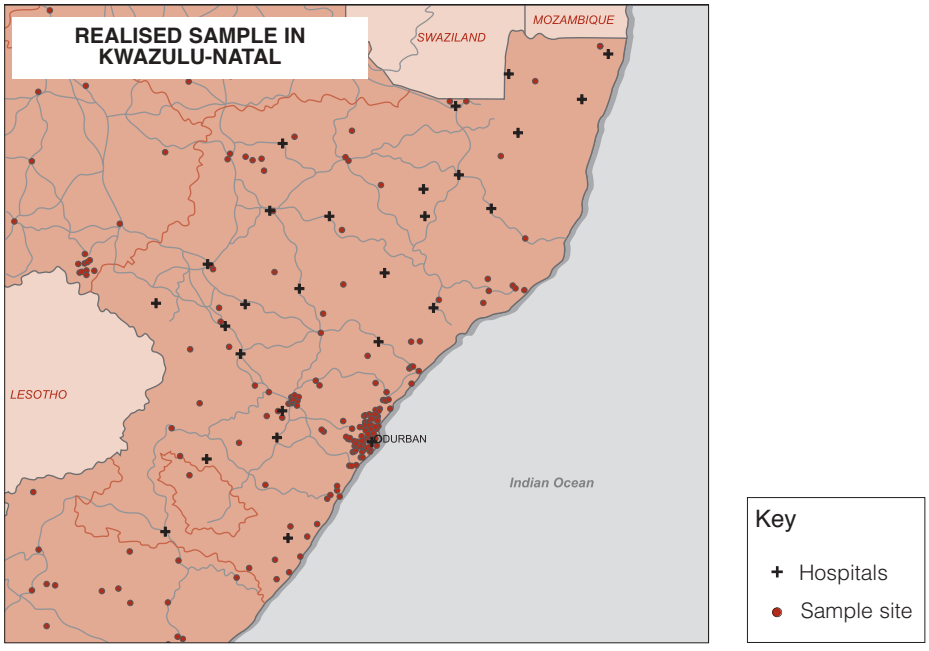


Figure 12: Map showing clinics and sites in KwaZulu-Natal

agricultural villages (men 8%, women 9%). A similar urban/rural distribution was found in Tanzania where 2.5% of the adult population in rural villages, 7.3% in roadside settlements and 11.8% in town were infected (Barongo et al. 1992).

Other studies have confirmed these findings. In Mwanza, Tanzania, the prevalence of HIV was twice as high in communities living along the roadsides in comparison to those living in villages distant from the main road (Grosskurth 1995). A study conducted in the remote mountains of Lesotho in 1995, found that all cases of HIV infection occurred amongst those subjects living along the main road (15 of 115) and no cases were detected amongst the 123 subjects living away from the main road (p=0.001) (Colvin 2000).

Recent evidence from northern KwaZulu-Natal has shown a strong correlation between the mean distance of a homestead from a primary or secondary road and HIV prevalence, with much higher prevalence in homesteads near roads (r=0.66, p=0.002). (Tanser 2000)

A second explanation for the relative ranking of KwaZulu-Natal may lie in the balance of its locality types. The three provinces with the highest HIV prevalence, Mpumalanga, Gauteng and Free State also have the highest prevalence of HIV among people living in informal settlements. The two provinces with the highest HIV prevalence also have the highest proportion of persons living in urban informal areas. These are Gauteng (19.9%) and Free State (16.9%). The Western Cape, which has higher prevalence of HIV based on household survey also has a large percentage of its population living in informal areas (12.8%). This may partly explain the reason for a higher HIV prevalence in these provinces when comparing household data with antenatal data. KwaZulu-Natal has the second lowest proportion of people living in informal settlements (5%). This may account for KwaZulu-Natal's relative ranking. Further studies are needed to validate the HIV prevalence in KwaZulu-Natal. Other studies do corroborate the lower HIV prevalence in KwaZulu-Natal. In an unpublished MRC 2001 study of 2,364 workers in chemical, transport and distribution companies, 9.4% were HIV positive. This figure was less than that of Gauteng (12.3% of 1,167 workers) and Western Cape (12.9% of 528 workers) and higher than that of Eastern Cape (6.5% of 2032 workers).

- HIV prevalence in the Western Cape: The observed HIV prevalence for women aged 15–49 years in the Western Cape of 18.5% (CI: 10.9–29.7%) is much higher than that observed from antenatal data. This is the only province where the HIV prevalence derived from the household survey is much higher than that derived from antenatal data. The Western Cape, just like Gauteng and Free State, has a high percentage of its population living in informal settlements (12.8%). This may explain the unusual finding. This finding requires further investigation.

- Relationship between HIV and socio-economic status (a proxy measure for poverty): While this study cannot claim to have adequately measured poverty, a perceived rating of adequacy of household income was utilised as a measure. The results were correlated with HIV prevalence. The study found that the relationship between perceived socio-economic status and HIV infection indicates that all strata of society are at risk and not only poorer persons. In particular, wealthy Africans have similar

levels of risk to less wealthy Africans. However, in the other race groups, lower socio-economic status appears to be related to higher likelihood of HIV infection, even after multivariate adjustment. Further work is required to create an index of poverty comprising detailed employment categories such as work in informal sector, formal sector, part-time employment, occupation, and sources of income. This might shed more light on the relationship between HIV and poverty. Further analysis of the data will be conducted.

- Relationship between HIV and education: A review of the literature shows that in Africa there is no simple relationship between HIV infection and levels of education. School attendance may increase access both to information (as shown strongly in this study) and potentially to prevention interventions. Also, in the longer term, an increased level of education may improve a person's ability to act on prevention messages. However, the improvements in socio-economic status and lifestyle changes that go with higher educational attainment may be associated with behaviours that increase risk of HIV infection (UNAIDS 1998).

  A recent comprehensive review of the association between HIV infection and educational attainment in developing countries (Hargreaves 2002) found that in Africa prior to 1996, increased schooling was either not associated with HIV or was associated with an increased risk of HIV infection. However, Hargreaves and colleagues report that there is now some evidence from Uganda and Zambia that the pattern is changing and that there is now an increasing burden amongst the less educated. The present study results show that among Africans there is a significantly increased risk of HIV infection amongst persons with higher educational levels and this may be because South Africa is still at an earlier stage of the epidemic than countries further north.

Findings requiring further research

The observation that the estimated HIV prevalence among children aged 2–14 years is 5.6% (CI: 3.7–7.4%) was unexpected. Once HIV prevalence was identified to be high in this group, a record review was undertaken to determine how many could have been infected through vertical transmission. The analysis was done focusing on those 2–11 years of age, as they are less likely to be sexually active. An analysis of the mother-child and father-child pairs revealed that of the 86 HIV positive children aged 2 to 14 years, 27 could be matched with a biological parent, and 20 of the parents selected in the study had an HIV test result. Of these 20, only five (25%) were HIV positive (four females and one male) and 15 (75%) were HIV negative. This raised the question of whether the biological parents of these children were alive or dead. The results found were that only seven (6.1%) of the 86 children had a biological mother who had died and a similar percentage (7%) had a biological father who had died. It remains unclear as to how these children could have been infected. An emerging theory that warrants further investigation is that there is unexplained HIV prevalence in children who have had no sexual exposure, or have parents with HIV negative mothers. In addition between 20–40% of HIV infections in African adults are associated with injections (Gisselquist et al. 2002). Given this unexplained high prevalence in children aged 2–14 years, it is necessary to test this theory in South Africa. Possible factors to be investigated include sexual abuse and unsterile needles.

3.2.10 Impact of access to HIV testing and awareness of serostatus

Because analysis of awareness of serostatus has to take into account the results of HIV testing used to estimate HIV prevalence, this subsection is presented using weighted data. Statistical tests were also performed on weighted data taking into account the design effects resulting from the cluster sampling procedure used in this survey.

Among respondents aged 15 years or more who agreed to be tested, 18.9% declared that they had previously been tested and that they were aware of their HIV serostatus. These proportions were 23.1% among HIV positive respondents and 18.2% among HIV negative respondents (p=0.06). It must be noted that nearly two thirds (62.6%) of those HIV positive who were unaware of their serostatus did not think that they could possibly get infected by HIV. Among those testing HIV negative, proportions of respondents who declared that they could not be infected by HIV were respectively 68.4% for those who previously underwent HIV testing and 73.4% among those who never did. It must be noted that respondents were not asked what their HIV status was, and there may have been some respondents who were tested prior to becoming HIV positive.

Among those who were HIV positive and aware of their status, 47.3% underwent HIV testing for personal reasons,[1] 22.5% during pregnancy, 14.8% following an external request (from employers, insurance companies, banks), and the remaining 15.4% referred to other circumstances. Interestingly, a higher proportion of those HIV negative and aware of their status had undergone testing because of external requests (37.5%) and a significantly lower proportion for personal reasons (29.7%). It must also be noted that prenatal HIV testing contributed to HIV testing in a greater proportion among Africans (25.3%) than in the other racial groups (9.0%).

Table 29 shows that for both HIV positive and HIV negative respondents, previous access to HIV testing, and consequently, awareness of serostatus was significantly associated with some common socio-cultural characteristics: respondents aged between 25 to 49 years, living in urban areas, with a higher level of education and strong religious background were more likely to have been tested for HIV.

Differences were noted between HIV positive and HIV negative respondents (Table 29). Amongst those who were HIV positive, females were significantly more likely to be aware of their serostatus than males, whilst the situation was reversed amongst those testing HIV negative. No effect of race on previous access to testing and personal knowledge of HIV diagnosis was observed amongst HIV positive respondents. In contrast, amongst HIV negative respondents, Africans were significantly underrepresented in the group of individuals who were aware of their serostatus. Overall, respondents who were HIV negative and who had access to testing were in higher socio-economic groups.

Table 29 also shows that awareness of serostatus, among both HIV-positive and HIV negative respondents, was associated with better knowledge about the fact that HIV causes AIDS and improved exchange of information about HIV and HIV serostatus with partner. It must be noted that among the HIV positive respondents who were sexually active in the previous year, awareness of serostatus was significantly associated with condom use at last intercourse, but that such relationship with condom use was not observed amongst HIV negative respondents.

1 Respondents who declared that they went for testing either because 'they felt sick', or because 'they had started a new relationship' or because 'they wanted to know their HIV status'.

Table 29: Awareness of HIV serostatus and characteristics of respondents (weighted data)

RESPONDENTS' CHARACTER-ISTICS	% AWARE OF SEROSTATUS AMONG HIV-POSITIVE INDIVIDUALS	p	% AWARE OF SEROSTATUS AMONG HIV-NEGATIVE INDIVIDUALS	p
Total	**23.1**		**18.2**	**0.06**
Sex				
Male	15.0	0.01	19.5	0.22
Female	28.1		17.3	
Age				
15–24	11.8	0.03	10.8	<0.0001
25–49	29.1		29.5	
50+	12.1		8.8	
Locality type				
Rural area	13.2	0.003	8.3	<0.0001
Urban area	28.3		25.7	
Race				
African	23.1	0.52	12.9	<0.0001
Others	28.1		34.6	
Level of education				
<High school	11.4	0.001	7.6	<0.0001
High school & more	29.7		25.0	
Religion				
Very important in personal life	27.4	0.02	20.7	<0.0003
Other	16.2		14.0	
Household resources				
Not enough money for basic goods	21.0	0.31	9.6	<0.0001
Other	26.5		26.2	
Marital status				
Living alone	24.4	0.61	13.4	<0.0001
Married	21.5		24.8	

RESPONDENTS' CHARACTER-ISTICS	% AWARE OF SEROSTATUS AMONG HIV-POSITIVE INDIVIDUALS	p	% AWARE OF SEROSTATUS AMONG HIV-NEGATIVE INDIVIDUALS	p
Sexual activity in prior 12 months				
Abstinent	20.4	0.49	6.6	<0.0001
One sexual partner	25.3		25.8	
Multiple sexual partners	16.0		16.3	
Has discussed HIV prevention with partner				
Yes	30.0	0.003	26.6	<0.0001
No	13.0		12.3	
Knows HIV serostatus of partner				
Yes	68.8	<0.0001	66.6	<0.0001
No	14.8		9.5	
Knows HIV causes AIDS				
Yes	26.6	0.003	21.5	<0.0001
No	11.7		8.3	
Condom use at last intercourse*				
Yes	33.0	0.03	26.6	0.42
No	19.1		24.4	

**In the subsample of those who had been sexually active in prior 12 months*

Although most people knew about VCT service availability, the majority of persons did not make use of VCT services. Only 19.8% of people who knew about VCT services made use of the services. The respondents who had not had an HIV test were asked if they would consider going for an HIV test. Looking at the population who said they would, 59.4% reported that they would consider a test if confidentiality was maintained (e.g. being unknown in the clinic, assured confidentiality) whilst 28.5% stated that they would consider HIV testing based on the accessibility, cost and quality of services. At least 12.0% indicated that they would be encouraged to undergo testing if the counsellors were more supportive (friendly, sensitive and helpful nurses). Amongst those who would not consider going for an HIV test, 71.7% reported that their reason was that they felt that they were at low risk of being infected. This suggests that reasons for undergoing VCT are more closely related to negative perceptions of services and low perceived risk than to problems of availability of services.

Our results show that awareness of serostatus has a positive impact on acceptability and adoption of preventive behaviours among individuals who are HIV positive. However, these results also point out the potential consequences of current limited availability of

voluntary counselling and testing, especially in rural areas and in poorer communities. Amongst the majority of the population who are HIV negative, access to testing is easier for groups with higher levels of education and income and testing does not appear to play a key role in behaviour change per se. However, results suggest that access to testing does not create a false feeling of reassurance among those who are HIV negative.

VCT for HIV is now acknowledged within the international arena as an effective and essential strategy for both HIV prevention and AIDS care (FHI 2002). The need for VCT is increasingly compelling as HIV infection rates continue to rise. The literature has shown that high-quality counselling and knowledge of HIV status helps individuals assess their level of risk, develop realistic plans to reduce their risk, and increase safer sex practices (USAID 2002). Those people who learn they are seronegative can be empowered to remain disease-free. For those HIV-infected, they have a chance to assess their options for treatment. The South African government has established more than 450 VCT centres with more than 800 counsellors around the country (DOH 2002). This study attempted to assess the extent to which South Africans have access to these services and the barriers to access.

Table 30 shows the results of the respondents who knew where to obtain VCT services. In most provinces, more than half of the sample knew where to access the services. The survey sample in Mpumalanga and Limpopo had the lowest percentage of persons who knew where to obtain VCT services. This study also found that about 40% of youth between the ages of 15 to 24 as well as a third of the adults between the ages of 25 to 49 did not know where to find these services. Urban respondents were more likely to know about VCT services than rural ones. Finally, the respondents from high educational backgrounds were more likely to know about VCT services than those from low educational backgrounds.

From the findings of this study, it is clear that VCT services are available in the country and people generally know about such services. As discussed earlier, although most people are aware of the services and how to access them, they do not necessarily make use of them. This might be due to the fact that people lack understanding of the importance of using these services. We suggest that existing prevention campaigns should increase emphasis on using VCT services. Clearly, the need for VCT services will increase as government rolls out the availability of generic anti-retroviral therapy in the public health sector in the near future.

3.3 Orphans

The premature death of parents deprives children of love, support and care. HIV/AIDS contributes to orphanhood, and for this reason there is an interest in estimating the magnitude of the orphanhood problem. In this study, we asked children or their guardians whether both the biological mother and the biological father were alive. The study found that 13% of children aged 2–14 years had lost a mother, a father or both. The study also found that 3% of children aged 2–14 years had lost their mother. This figure is similar (1.9% to 2.8%) to the one calculated from the October Household Survey of 1995 (Anderson et al. 2002). In addition this study found that 8.4% of children had lost their father. This figure is not that different from that obtained through calculations based on the October Household Survey conducted by StatsSA, which is between 9.5% and 12.5% (Anderson et al, 2002).

Table 30: Response by various sub-samples about their knowledge of availability of VCT services

VARIABLE	n	YES (%)	p	VARIABLE	n	YES (%)	p
Total	**7084**		**n.s.**	**Locality type**			p<0.001
Sex of respondent				Tribal area	1475	48.1	
Male	3025	60.3		Farm	486	53.7	
Female	4059	62.5		Urban formal	4309	65.9	
Age groups			p<0.001	Urban informal	814	67.2	
15–24 years old	2428	59.9		**Race groups**			p<0.001
25–49 years old	3139	68.5		Africans	4213	58.7	
50 and more	1517	49.8		White	676	69.8	
Provinces			p<0.001	Coloured	1358	67.7	
WC	932	66.5		Indians	837	59.1	
EC	1053	58.5		**Education level**			p<0.001
NC	520	78.8		No school	694	40.8	
FS	451	63.6		Primary school	1664	55.3	
KZN	1437	61.2		High school	2823	64.5	
NW	531	58.4		Matric	1342	69.2	
GT	1124	68.9		Tertiary education	561	72.5	
MP	431	44.3		Total n	4359	2725	
LP	605	45.0		%	61.5	38.5	

UNAIDS estimated that 660 000 children in South Africa have been orphaned due to AIDS (UNAIDS, 2002). UNAIDS defines an AIDS orphan as a child aged 0–14 years who has lost one or both parents to AIDS. This study was not able to estimate the percentage of the orphans who could have lost their parent(s) to AIDS.

Additional information collected in this survey includes age of the child at the time of death, highest level of education, details regarding the environment of the child, etc. Further analysis of the situation of these children will be undertaken.

3.4 Child-headed households

Many community-based assistance programmes report an increase in households headed by children, or consisting only of children, i.e. orphans or children without resident adult guardians. However, no national data on child-headed households has yet been reported. In this survey, just 3% of households were reported as being headed by a person between the ages of 12 and 18 years of age, and could thus be called a child-headed household (Gow & Desmond 2002). The percentage observed was 3.1% in urban formal areas, 4.2% in informal urban areas, 2.8% in tribal areas and 1.9% in farms.

3.5 Behavioural risks

The following section presents a range of indicators for sexual behaviour. This is followed by self-reported behavioural change and socio-cultural practices.

3.5.1 Age at sexual debut

The median age at first sex refers to the point at which half of respondents in a particular age category have had sex. The median age at first sex for respondents 25 years and older was 18 years. However, earlier median ages at first sex were noted amongst younger age groups. The median age of sexual debut amongst current 25–34 year olds was 17 years and for current 35–44 year olds it was 18 years. Amongst sexually active 15–24 year olds the median age was 16 years, but this figure applies only to the 56.8% of respondents in that age group who were sexually active.

An inter-age analysis was done in order to see if any shifts in the age of sexual debut had occurred across generations. Figure 13 shows the cumulative distribution of age at first sexual intercourse amongst sexually active older youth and adults in ten-year age ranges from 20 up to 49 years of age. The figure shows a trend towards earlier sexual debut amongst younger respondents. In other words, persons in younger age bands are more likely to have had sex at a younger age than persons older than themselves.

3.5.2 Sexual experience

Table 31 shows the breakdown of sexual experience by gender and also by locality type. The table shows that only a few children in the 12–14 year age group reported having had sex before. More importantly, sexual experience amongst youth was significantly

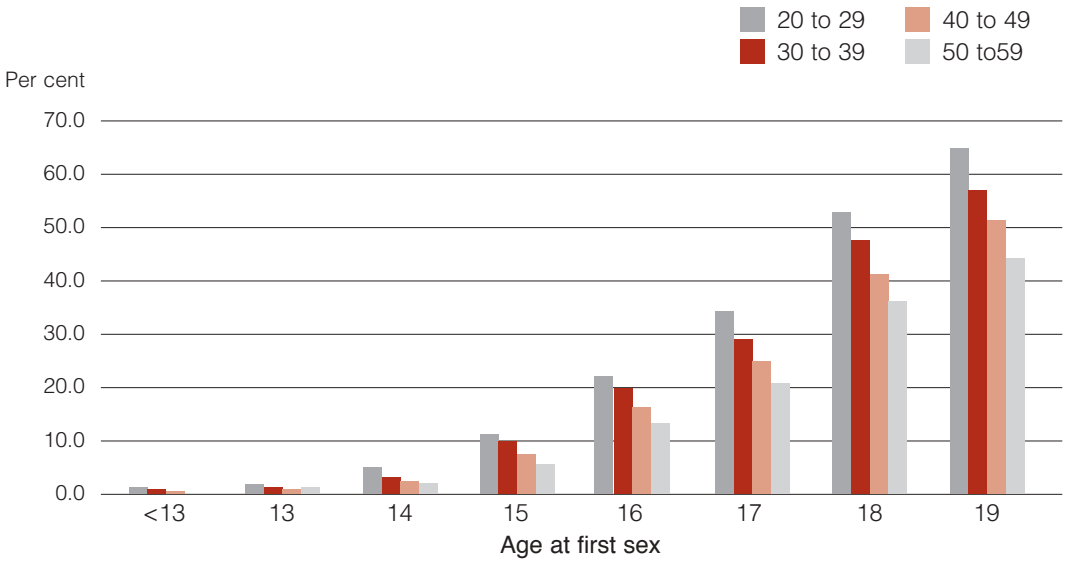


Figure13: Inter-generational analysis of changes in the age of sexual debut among 20-49 year-old adults in the study who were sexually active, South Africa 2002

higher in urban informal areas than in other types of localities. Sexual experience amongst adults was evenly distributed across gender and locality type.

Table 31: Sexual experience by gender and by locality type, South Africa 2002

VARIABLE	AGE GROUP								Total
	12–14 years old		15–24 years old		25–49 years old		50+ years old		
	%	n	%	n	%	n	%	n	n
Gender									
Male	1.1	360	55.6	1148	98.1	1285	98.7	595	3028
Female	1.6	381	57.9	1284	97.7	1854	95.8	923	4061
Locality type									
Rural*	0.9	218	58.3	761	97.5	711	97.5	489	1961
Urban informal	1.8	37	74.0	235	97.8	448	97.0	132	815
Urban formal	1.5	462	53.2	1436	98.1	1980	96.5	897	4313

** Combined farm and tribal areas*

Sexual partnerships

Table 32 below provides information for respondents who had sex in the past 12 months. Most respondents indicated that they had a single partner during the past 12 months, and the proportion of those with more than one partner was lower for females (3.9%) than for males (13.5%) ($p<0.001$). For both sexes, youth were more likely to have had more than one partner in the past year, whereas most older respondents had only one partner. A higher proportion of Africans and male or female respondents living in urban informal areas had multiple partners.

Secondary abstinence

Table 33 presents data on secondary abstinence. The discontinuation of sex for periods of time after initial sexual activity is referred to as secondary abstinence. Among respondents who had had at least one sexual partner in their life, 23.1% had no sex over the past 12 months (secondary abstinence).

Secondary abstinence is higher amongst youth than adults 25–49 years. Sexual activity declines after age 50, particularly amongst females. Adult females were nearly twice as likely to be abstinent than males.

Sexual frequency

Figure 14 shows sexual frequency in the last 30 days by age group. Adults 25–49 reported higher levels of sexual frequency than youth and adults over 50. Sexual frequency declined significantly for adults over 50. It is however important to note that seven out of ten sexually active youth had sex four or less times per month. This suggests lower levels of sexual opportunity than amongst adults.

Table 32: Sexual activity over the past 12 months by characteristics of respondents, South Africa 2002

		MALE				FEMALE		
		One partner	> one partner	p		One partner	> one partner	p
Age	n	%	%	<0.001	n	%	%	<0.001
15–24	517	77.0	23.0		634	91.2	8.8	
25–49	1149	88.5	11.5		1494	97.5	2.5	
50+	440	92.5	7.5		321	99.4	0.6	
Locality type				<0.001				<0.001
Tribal area	313	80.8	19.2		506	96.8	3.2	
Farm	208	91.8	8.2		180	95.6	4.4	
Urban formal	1244	89.8	10.2		1510	96.2	3.8	
Urban informal	341	76.5	23.5		253	94.5	5.5	
Race				<0.001				<0.001
African	1264	82.4	17.6		1461	95.4	4.6	
White	231	93.9	6.1		250	97.6	2.4	
Coloured	361	91.1	8.9		488	96.3	3.7	
Indian	250	93.6	6.4		250	98.4	1.6	
				<0.001				<0.001
TOTAL	**2106**	**86.5**	**13.5**		**2449**	**96.1**	**3.9**	

Table 33: Previously sexually active, but no sex in past 12 months (secondary abstinence)

VARIABLE	AGE GROUPS						TOTAL
	15–24 years		25–49 years		50+ years		
	%	n	%	n	%	n	n
Gender							
Male	18.4	632	8.9	1252	23.8	576	2460
Female	13.9	732	17.4	1801	63.6	881	3414
Race							
African	14.1	928	14.3	1766	53.1	825	3519
White	11.0	73	9.2	306	31.7	202	581
Coloured	22.3	264	15.7	616	48.5	241	1121
Indian	20.6	97	12.8	358	41.7	187	642

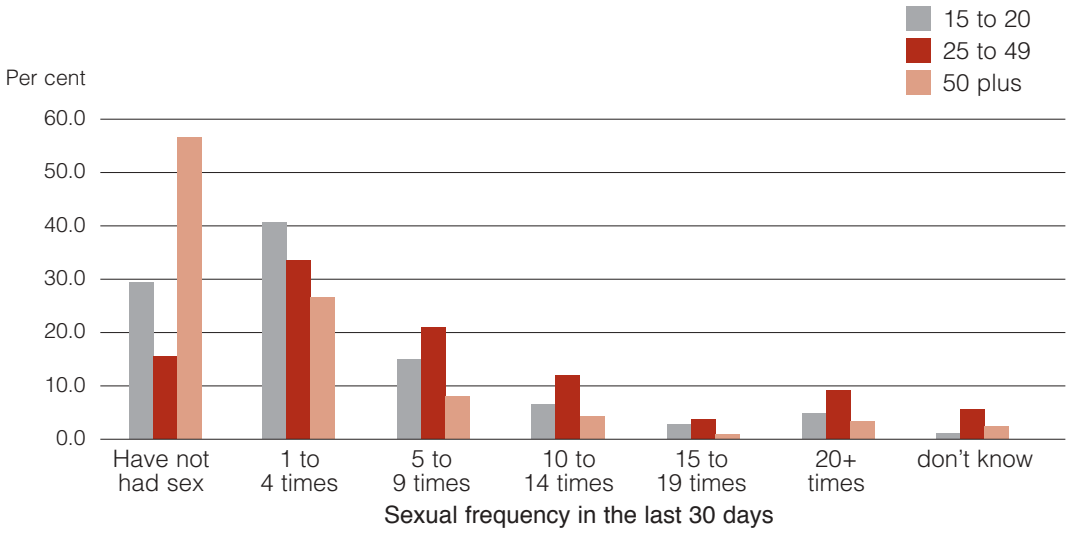


Figure 14: Sexual frequency in the last 30 days by age group

3.5.3 Condom access and use

Condoms are an important means of preventing unwanted pregnancy, sexually transmitted infections and HIV infection. Over 267 million condoms were distributed free by the Department of Health in 2001, and condoms are also distributed via social marketing and commercial sales.

Table 34 shows the responses about whether it was possible for respondents belonging to various age groups from different socio-demographic backgrounds to get a condom if they needed one. The table shows that the highest levels of perceived access to condoms were found in the Free State. This was true for both youth and adult respondents. This was followed by Mpumalanga for youth and North West Province for adults. Therefore, there was a strong general perception that condoms were readily accessible, with most sexually active respondents agreeing that they could get a condom should they need one.

Table 35 displays the various sources of condoms for different age groups, provinces and locality types. The table shows that public clinics and hospitals were the most common source of condoms for both males (35.2%) and females (45.3%). Most respondents (80.9%) in different provinces and types of localities accessed free condoms.

Condom use during last sexual encounter in last 12 months

Table 36 summarises proportions of respondents who had sex in the last year who used a condom during their last sexual intercourse. Almost a quarter (24.7%) of females and a third (30.3%) of males used a condom during the last sexual intercourse. Younger respondents and those with multiple partners were more likely to use a condom in the past 12 months than others. Youth had significantly higher rates of condom use (57.1% for males and 46.1% for females) than adults, especially those who were over 50 years of

Table 34: Responses by sexually active respondents to the question: 'Should you need a condom, is it possible to get one?' for different ages by sex, province, and locality type

VARIABLE	AGE GROUPS						TOTAL
	15–24 years		25–49 years		50+ years		
	%	n	%	n	%	n	n
Gender							
Male	95.6	634	94.9	1255	81.2	574	2463
Female	94.7	737	90.9	1799	67.2	856	3394
Total	95.1	1371	92.6	3054	72.8	1430	5855
Province							
WC	94.6	203	91.0	422	75.9	166	791
EC	92.9	239	86.6	381	57.5	259	879
NC	85.5	83	87.8	222	69.4	111	416
FS	100.0	97	97.7	213	85.1	87	397
KZN	97.0	233	94.3	600	78.1	300	1139
NW	92.5	106	96.3	243	84.5	110	459
GT	98.1	207	94.0	569	79.3	179	955
MP	98.7	76	92.9	169	67.1	82	327
LP	94.5	127	92.8	235	66.2	130	492
Locality type							
Rural*	93.2	411	89.2	692	67.0	463	1566
Urban informal	95.9	171	93.1	436	76.2	126	733
Urban formal	96.0	759	93.7	1926	75.5	841	3526

** combined tribal areas and farms*

Table 35: Sources of condoms by age, province and locality type

VARIABLE	SOURCE OF CONDOMS												
	Public Clinic/ Hospital		Private Clinic/ Hospital		Pharmacy		Shop / garage		Spaza / Shebeen		Other		Total
	%	n	%	n	%	n	%	n	%	n	%	n	n
Age													
15–24	43.1	386	11.8	106	16.8	150	9.4	84	3.4	30	15.5	139	895
25–49	39.2	553	13.8	195	19.4	273	5.8	82	1.6	22	20.2	285	1410
50+	35.6	80	13.3	30	28.4	64	7.1	16	0.9	2	14.7	33	225
Province													
WC	40.4	133	11.9	39	14.9	49	10.6	35	0.6	2	21.6	71	329
EC	48.5	138	13.0	39	10.3	31	5.3	16	5.3	16	20.3	61	301
NC	35.9	51	11.3	16	11.3	16	7.7	11	0.7	1	33.1	47	142
FS	57.4	97	11.8	20	13.6	23	2.0	5	0	0	14.2	24	169
KZN	23.1	122	17.8	94	31.4	166	8.3	44	2.3	12	17.0	90	528
NW	45.0	99	15.0	33	16.4	36	4.1	9	3.6	8	15.9	35	220
GT	46.2	232	7.8	39	23.7	119	8.6	43	0.8	4	12.9	65	502
MP	27.0	30	16.2	18	19.8	22	7.2	8	4.5	5	25.2	28	111
LP	51.3	117	14.5	33	11.0	25	4.8	11	2.6	6	15.8	36	228
Locality type													
Rural*	48.4	260	15.5	83	12.7	68	4.5	24	3.7	20	15.3	82	537
Urban informal	51.1	170	13.8	46	9.6	32	5.1	17	2.7	9	17.7	59	333
Urban formal	35.5	589	12.0	202	23.3	387	8.5	141	1.5	25	19.0	316	1660

** combined tribal areas and farms*

age (less than 10%) ($p<0.001$). Similarly, almost half of the respondents who had more than one sexual partner over the past 12 months had used a condom compared to less than 30% for respondents with only one partner ($p<0.001$). Condom use among Africans of both sexes was significantly higher in informal urban areas than in other locality types ($p<0.001$). Condom use at last intercourse was also linked with other prevention behaviours such as discussing prevention with partners and individual perception of being at risk for HIV infection. In addition, respondents who knew someone who was HIV positive were also more likely to use a condom than others ($p< 0.001$).

Table 36: Condom use during the last sexual intercourse by characteristics of respondents

VARIABLE	MALE*			FEMALE*		
	n	%	p	n	%	p
TOTAL	2106	30.3		2449	24.7	
Age			< 0.001			< 0.001
15–24	517	57.1		634	46.1	
25–49	1149	26.7		1494	19.7	
50+	440	8.2		321	5.6	
Locality type			< 0.001			< 0.001
Tribal area	313	30.7		506	24.9	
Farm	208	20.7		180	15.6	
Urban formal	1244	30.8		1510	23.6	
Urban informal	341	34.0		253	37.2	
Race			< 0.001			< 0.001
African	1264	34.3		1461	30.9	
White	231	27.7		250	15.2	
Coloured	361	22.4		488	14.1	
Indian	250	24.0		250	18.8	
Sexual activity			< 0.001			< 0.001
One partner	1822	27.4		2354	24.0	
Multiple partners	284	48.6		95	43.2	
Know someone HIV+			< 0.001			=0.002
Yes	261	35.2		352	31.0	
No	1845	29.6		2097	23.7	
Discuss prevention with partner			< 0.001			< 0.001
Yes	1264	40.0		1390	34.5	
No	833	15.4		1048	11.6	

** Computations are based on the sample of respondents who had at least one sexual intercourse over the past 12 months*

Last sexual intercourse condom use for different age groups according to marital status, partner status and HIV test history

Table 37 shows reported condom use for different age groups according to marital status and partner status. The table shows that respondents who were single were considerably more likely to use a condom than those who were married ($p<0.001$). Both youth and adults who had two partners in the past year were more likely to use a condom at last sex than those who either had only one sexual partner or had three or more partners ($p<0.001$). Similarly, both youth and adults who had more than one current partner were more likely to use a condom during the last sexual encounter than respondents with only one current partner ($p <0.001$).

Table 37: Last sexual intercourse condom use by marital status, partner status and age

VARIABLE	AGE GROUPS						TOTAL
	15–24 years		25–49 years		50+ years		
	%	n	%	n	%	n	n
Marital status							
Single	52.8	1264	32.6	1292	5.3	527	3083
Married traditional	21.1	71	13.2	916	4.4	544	1531
Married civil	30.4	46	15.8	865	5.0	400	1311
Partner status							
One sexual partner in last year	50.1	9721	21.2	2466	6.9	725	4162
Two partners in past year	59.3	108	49.1	108	16.0	25	241
Three or more partners in past year	48.5	303	20.4	499	2.5	703	1523
One current sexual partner	49.0	991	21.5	2497	6.8	720	4208
More than one current sexual partner	52.0	348	42.0	555	2.9	746	1649

When adults who had had an HIV test were compared to those who had not done so, it was found that 25.1% of the former (n=1659) used a condom at last sex as compared to 20.2% of the latter (n=5364). This suggests that HIV testing has a positive influence on condom use.

3.5.4 Self-reported behaviour change

In order to understand the impact of the HIV/AIDS epidemic on the behaviour of South Africans in general, the participants in this study were asked whether they had changed their behaviour in the last few years and how they had done so. The results obtained are

summarised in Table 38. Altogether 40.2% of the adult and youth participants in the study indicated that they had changed their behaviour. The table shows that significantly more males reported that they had indeed changed their behaviour (p<0,001). When asked to specify in what way they had changed their behaviour a similar majority of both sexes indicated that they had only one partner and were faithful to their partner. The second most frequent behavioural strategy was that they always used condoms, with significantly more males doing so than females (p<0.001). This was followed by abstaining from sex and significantly more females than males reported to have done so (p< 0.001).

Table 38: Self-reported behaviour change by sex

BEHAVIOUR CHANGE Main issue (n=7089)	n	YES (%)	p
Have changed their behaviour in the last few years	3028	45.3	<0.001
Self-reported behaviour change (n=2853)			
Have only one partner/being faithful	1385	65.1	n.s.
Abstain from sex	1385	18.1	<0.001
Always use a condom	1385	33.9	<0.001
Partner and self have an HIV test before having sex	1385	2.5	n.s.
Have reduced the number of sexual partners	1385	12.2	<0.001

3.5.5 Socio-cultural context

In order to validate the socio-cultural context within which sexual behaviour occurs in South Africa, the prevalence of various socio-cultural practices was examined. Concerning circumcision, it was found that 35% of all adult and young males were circumcised. The mean age of circumcision was 15 years and the median 17 years.

With regard to polygamy, only 3.4% of those who were married (both male and female) (n=3 594) reported that they were in a polygamous (i.e. polygynous) relationship. Concerning lobola or dowry, about 50.2% of those who were married (both male and female) (n=3 374) reported that lobola or dowry had been paid when they got married.

When asked if they practised anal sex, only 2.2% of the 4 280 participants who responded to the question answered affirmatively.

When asked if they had consulted with a traditional and/or alternative healer in the last 12 months, only 8.6% of the youth and adult samples responded affirmatively.

Of the 1 678 women who responded to the question regarding the death of a husband, 31.6% indicated they were widows. Of the 467 widows who responded to the question regarding whether they practiced spousal inheritance, 3.6% responded in the affirmative.

Over half of the widows (57%) indicated that they were required to abstain from sex during the mourning period. Finally, 53% of the widows (n=256) indicated that they were required not to have any relationships with men.

3.5.6 Discussion

Sexual debut

The finding that the median age of sexual debut was 18 years of age for both sexes in the present study is of interest as usually males lag behind females by at least a year. Inter-age analysis shows that the median age at first sex appears to be declining, with younger age groups having sex earlier. Whilst this is likely to be a product of a range of factors associated with modernisation, it does not necessarily follow that these trends cannot be reversed. Elsewhere in this study, reference is made to the positive impact of condom promotion campaigns, and campaigns focusing on abstinence and delayed sexual debut. The results are lower than the global average found in the Durex Global Sex Survey (2000) and also to those reported by UNAIDS for several other countries, except for males in Zambia (see Table 2).

Sexual experience

The finding that the large majority of respondents who were sexually active had only one partner and just about 40% had either not had sex before or had abstained from sex during the past 12 months, are similar to findings reported in the SADHS (1998) report.

A notable finding in this study was the fact that the majority of those who had more than one partner over the past year were youth from urban informal areas that were also found to have high HIV prevalence in the present study. However youth who had more than one partner were also more likely to be protecting themselves from HIV infection through greater condom use.

Levels of secondary abstinence amongst youth show promise, with 16.2% of sexually experienced youth not having had sex in the past year. This may be linked to lack of opportunity, or to personal choice amongst other factors. Further research into this phenomenon is suggested.

Concerning levels of sexual activity, very low levels were reported amongst children in the 12–14 year age group, and relatively low levels (25%) amongst 15–17 year old youth. This finding differs from that of other studies. For example, 31% of 12–17 year old youth were reported to be sexually active in a survey by loveLife (2001), whilst 13% of 12–14 year olds and 42% of 15–17 year olds were reported to be sexually active in a later survey (loveLife, 2002) survey. Reutenberg et al. (2001) in a survey of youth in KwaZulu-Natal, found that 10% of 14–15 year olds, 51% of 16–19 year olds and 85% of 20–22 year olds had had sexual intercourse. A review by Eaton et al. (2002) cites a number of studies including Makiwane's (1998) study of females in the Eastern Cape aged 15–19, which found sexual experience by age to be 25% for 15 year olds, 58% for 16 year olds and 82% for 17 year olds; and Visser and Moleko's (1999) study of Grade 6 and 7 pupils, mostly aged 12–14, in a disadvantaged urban area of Gauteng, which found 24% were sexually experienced. The low levels of sexual activity amongst 12–14 year olds found in this study, and the relatively low levels in some other studies, suggest the relevance of

life skills and communication interventions endorsing existing appropriate behaviour (i.e. abstinence). Given that only one in four 15–17 year olds report sexual activity, life skills and communication interventions should emphasise abstinence and delay of sexual debut, alongside condom use for those who are sexually active.

Sexual experience amongst 15–24 year olds is significantly higher in informal urban areas, and special emphasis should be placed on these areas for prevention interventions. It is a promising finding that partner turnover amongst youth and adults does not appear to be high, with 84.7% of youth and 93.5% of adults reporting that they have had only one partner in the past year.

Sexual frequency amongst sexually active youth is quite low, with the majority of youth (70%) having sex four or less times a month, and 29% having no sex at all. This suggests that opportunities for sexual activity are limited amongst youth. Lower levels of sexual frequency reduce risk of HIV infection, and it would be interesting to explore potentials for messaging in this regard.

Condom access and use

Condom distribution systems in South Africa are clearly highly sophisticated, and perceptions of ease of access to condoms was over 90% for both youth and adult age groups. Public sector clinics and hospitals were the most likely source of condoms. This demonstrates the high levels of effectiveness of the free condom distribution system that has been a cornerstone of the Department of Health's policy since the mid-1990s.

The levels of condom use of 57.1% and 46.1% amongst male and female youth respectively are encouraging. These levels are considerably higher than those in the SADHS (1998), which found last sex condom use to be 19.5% amongst 15–19 year old women (see Table 39 for other comparisons between findings from SADHS and the present study). The results suggest considerable changes in sexual behaviour amongst comparative groups of women between 1998 and 2002 in South Africa.

A shift in female partnerships has taken place in the last four years. It appears that women aged 15–24 years are moving away from single partnerships towards secondary abstinence. A larger percentage of 15–19 year olds (70.3%) reported no sexual partner in the last 12 months, an increase of over 10% from the SADHS (59.7%). As expected, this is counteracted with a decrease in single rates falling from 36.7% among 15 to 19 year olds in the SADHS to 26.9% in the present study. Generally, declines in multipartnerism amongst other age groups are also seen.

Rates of condom use at last sex have increased amongst all women with an increase from 8% to 28.6%. Among 15–19 year old women, 'ever' condom use increased from 28.4% to 69.6%. Rates of condom use at last intercourse more than doubled amongst young women 15–19, from 19.5% to 48.9%. Amongst this group of women, non-urban dwellers showed a more dramatic increase over the four year period. African and Indian women showed the greatest increases in condom use at last sex, with African women 15 to 49 years old being nearly three times more likely to have used a condom at last sex in 2002 than in 1998 (33.3% vs 9.2%). Condom use at last sex among Indian women 15 to 49 years old also rose dramatically from 1.8% in 1998 to 21.2% in 2002. Condom use for sexually active persons has also been shown to be high in other studies: for example,

Table 39: Comparison of present study and SADHS 1998

SAMPLE	SUB-CATEGORY	n	PRESENT STUDY 2002 (%)	n	SADHS 1998 (%)
Number of sexual partners in past 12 months					
All women 15–29	15–19, no sexual partner	688	70.3	2249	59.7
	15–19, one partner	688	26.9	2249	36.7
	15–19, 2+ partners	688	2.8	2249	2.9
	20–24, no sexual partner	596	31.5	2075	17.8
	20–24, one partner	596	63.5	2075	76.9
	20–24, 2+ partners	596	5.0	2075	3.5
	25–29, no sexual partner	328	18.8	2858	10.2
	25–29, one partner 328	77.9	2858	84.5	
	20–29, 2+ partners 328	3.3	2858	3.7	
Used a condom last sexual intercourse					
Women aged 15–49 who had sex in the past 12 months	All	2125	28.6	8617	8
Women 15–29 who had sex in the past 12 months	15–19	206	48.9	854	19.5
	20–24	428	47.0	1628	7.6
	25–29	334	34.3	1597	14.4
Women 15–49 who had sex in the past 12 months	Urban	1543	29.2	5207	10
	Non-urban	582	27.8	3410	5.5
	African	1296	33.3	6853	9.2
	White	187	12.2	637	4.3
	Coloured	432	11.5	777	5.6
	Indian	207	21.2	266	1.8
Cannot become infected by touching a person with HIV/AIDS					
Women aged 15–49	Non-urban	1543	87.3	3410	61.5
	Urban	582	93.5	5207	82.8
	All	2125	91.0	8617	74.5

'always use a condom', 55% of 12–17 year olds (loveLife, 2001); 'condom use last sex', 66% of 16–19 year olds (Rutenberg et al., 2001); 'condom use last sex', 60% of 12–17 year olds (loveLife 2002) condom use last sex, 15–24 year olds, 66% (Parker et al. 2002). This study confirms these trends as do the condom access findings discussed above. Our findings also compare favourably with those found in other countries such as Brazil, Senegal and Uganda but are much higher than the rates reported for Cambodia, Thailand and Zambia.

Although levels of condom use in adults were lower, they were considerably higher amongst those at greater risk such as unmarried adults, and those with more than one current partner. There was however a downward trend amongst both youth and adults who had a partner turnover of three or more in the past year, suggesting that a small but high-risk cohort exists in these age groups.

Condom use amongst married couples was higher than expected. Whilst a small proportion of the couples may be using condoms for HIV prevention, it is likely that condoms are also being used for contraception. Clearly, HIV/AIDS prevention strategies need to take advantage of this fact by encouraging married couples to use condoms as an effective and readily accessible method of contraception.

High levels of last intercourse condom use demonstrate the effectiveness of mass media communication campaigns, which show highest levels of recall of condom messaging as discussed later, and which have clearly been supported by highly effective condom distribution systems as discussed previously.

Self-reported behavioural change

It would appear that a fairly large proportion of participants who reported changing their behaviour had done so via a range of strategies including abstaining from sex, being monogamous and using condoms. These results, especially condom use, are partly consistent with the results from the last HSRC (1999) survey in which 44% of the sample reported that they were using condoms because of AIDS, 67% of the sample reported that AIDS had made them think of changing their behaviour and 69% indicated that AIDS encouraged them to use condoms.

Socio-cultural practices

Various socio-cultural practices such as polygamy, dry sex, anal sex, rites of death of spouse for widows, and consultation with traditional and alternative healers during the last 12 months which according to the literature review are believed to be widespread in South Africa, were found to be uncommon (e.g. for dry sex, see Louria et al. 2000; Morris & Williamson 2001; for anal sex see Abdool Karim & Ramgee, 1998; Halperin 1999; for traditional healing see Hopa et al., 1998). However, circumcision and payment of lobola or dowry are fairly widespread as expected (for circumcision, see Dreyer, 1999; Van Vuuren & De Jongh, 1996; also see Simbayi, 2002 for a review). How these two issues are related to HIV infection will be addressed in a separate analysis at a later stage.

3.6 Knowledge, perceptions and attitudes

This section examines the status of knowledge about HIV/AIDS, and its relation to prevention practices and attitudes to PLWAs.

3.6.1 HIV/AIDS knowledge

Table 40 presents findings relating to key knowledge indicators for different age groups.

Although most respondents have correct knowledge of HIV/AIDS in the six areas asked about, some areas of knowledge are significantly poorer. Knowledge deficit is reflected in two ways – through incorrect responses and through 'don't know' responses. The levels of 'don't know' responses reflect uncertainty whereas incorrect responses mean a distinctly incorrect view ('no' for items 1 and 2; 'yes' for items 3–6). Generally the oldest age group (50 and older) had the highest levels of incorrect responses, followed by the child group (12–14). These two age categories also tend to have higher levels of uncertainty (don't know) than do 15–49 year olds. The proportion of respondents with incorrect knowledge is low relative to the proportion that is uncertain. The area with the least incorrect responses was 'AIDS can be cured by sex with a virgin' (1.6% of those 15 years or older and 1.7% of children). However, relatively high percentages (10.1% and 23% respectively) responded 'don't know' meaning relatively high proportions of uncertainty about this dangerous myth.

The beliefs that HIV causes AIDS, that AIDS can be caused by witchcraft and that HIV can be transmitted by touch have approximately the same proportions of incorrect

ble 40: HIV knowledge by age of respondent (%)

	12–14 yrs (n=730)			15–24 yrs (n=2432)			25–49 yrs (n=3139)			50 yrs + (n=1518)			15 yrs + (n=7089)		
	yes	no	dk*	yes	no	dk*	yes	no	dk*	yes	no	dk*	yes	no	dk*
causes	70.5	4.6	25.0	81.2	5.2	13.6	79.3	3.5	17.3	61.9	3.6	34.5	75.7	4.0	20.3
											P<0.0001				
y can ne HIV positive through breastfeeding	52.1	15.8	32.1	49.5	20.8	29.8	56.1	21.3	22.6	52.2	12.6	35.2	53.2	19.0	27.8
											P<0.0001				
HIV can be transmitted by kissing	12.8	64.3	23.0	10.3	75.9	13.7	9.8	74.6	15.6	14.4	51.6	34.0	11.1	69.5	19.4
											P<0.0001				
AIDS can be caused by witchcraft	2.4	74.2	23.4	3.7	85.3	11.1	3.6	86.1	10.3	6.0	69.0	25.0	4.2	81.7	14.1
											P<0.0001				
HIV can be transmitted by touch	4.9	81.2	13.9	4.5	91.0	4.4	4.1	89.9	6.0	7.6	70.4	22.0	5.1	85.6	9.4
											P<0.0001				
AIDS can be cured by sex with a virgin	1.7	75.3	23.0	2.3	89.2	8.5	1.1	92.8	6.2	1.7	78.8	19.5	1.6	88.3	10.1
											P<0.0001				

** refers to 'don't know' responses*

responses, all falling under 5%. However, the belief that HIV causes AIDS has a relatively high proportion of don't know responses (20.3%) meaning that there is uncertainty in this area one in five respondents. If we add the don't know and incorrect responses on this item we derive a figure of 24.3% of respondents who have either incorrect knowledge or are uncertain about the causal relationships between HIV and AIDS.

Areas of highest incorrect and uncertain responses are knowledge that HIV can be transmitted by breastfeeding and that HIV is not transmitted by kissing. In particular knowledge about breastfeeding is poor and 46.8% of respondents either provided an incorrect response or were uncertain. Regarding transmission of HIV through kissing, 30.5% were either incorrect or uncertain. The youth group (15–24) stands out as having significantly better knowledge in this area with a much higher proportion of definite 'no' responses. It should be noted that the question of whether HIV can be transmitted through kissing is possibly subject to problems of definition. It is also possibly confounded by the fact that some respondents may have said 'don't know' because of better knowledge rather than uncertainty, because they know that kissing under some conditions (e.g. mouth sores) might involve risk. This may have inflated the 'don't know' responses on this item.

3.6.2 Relationship between various socio-demographic variables and HIV/AIDS knowledge

Table 41 presents HIV/AIDS knowledge by various demographic characteristics. To analyse these relationships a composite scale of knowledge was developed. A score of one was assigned to respondents who disagreed or strongly disagreed with the statement that 'HIV can be passed on by kissing a person who is HIV positive', 'AIDS can be caused by witchcraft' and 'HIV can be passed on by touching a person who is HIV positive'. A score of 0 was assigned to those who were unsure, who agreed or strongly agreed. Similarly, a score of 1 was assigned to those who agreed or strongly agreed that 'HIV causes AIDS' and 0 assigned to those who were unsure, disagreed or strongly disagreed. In this way, every respondent obtained a score of knowledge on a scale from 0 to 5. The higher the score the better the level of knowledge of HIV transmission. Results of the score in relation to respondents' socio-demographic characteristics are shown in the following table.

Males and females do not differ significantly in respect of HIV/AIDS knowledge. However, respondents who are younger, more educated, who live in urban rather than rural areas, who are employed and who have higher household socio-economic status, are more informed about HIV/AIDS. The white population group is the most informed, followed by the Indian, African and coloured race groups.

The range of scores is particularly high in the education category meaning, not surprisingly, that education level is the social category, which most strongly differentiates those with good and poor knowledge. To illustrate, only 59.9% of respondents with no education believed that HIV transmission is not possible by touching an HIV infected person, against 81.3% among those with primary school level education and more than 90% among those with high school level or more.

Table 41: Knowledge and socio-demographic characteristics (respondents 15 years and older)

		n	score	SD	F
Sex of respondent	Male	3028	3.68	0.04	0.49
	Female	4061	3.64	0.04	
Age	15–24	2432	3.83	0.04	P<0.0001
	25–49	3139	3.86	0.03	
	>49	1518	3.05	0.08	
Locality type	Rural	1961	3.86	0.03	P<0.0001
	Urban	5128	3.38	0.05	
Race	African	4214	3.64	0.03	P<0.0001
	White	679	3.99	0.06	
	Coloured	1359	3.29	0.10	
	Indian	837	3.85	0.06	
Education	No school	694	2.52	0.11	P<0.0001
	Primary	1664	3.44	0.05	
	High	2826	3.90	0.04	
	Matric	1343	4.07	0.04	
	Tertiary	562	4.17	0.06	
Employment	Yes	2445	3.89	0.04	P<0.0001
	No	4644	3.55	0.03	
Household situation	Not enough	2975	3.45	0.04	P<0.0001
	Just enough	2558	3.78	0.04	
	Most things	1120	3.97	0.05	
	Extra money	436	3.95	0.09	

3.6.3 Knowledge and prevention behaviours

Table 42 shows the findings regarding correct knowledge of HIV prevention behaviours. As in most previous surveys, knowledge of HIV transmission is not clearly linked with sexual activities of respondents. For instance, amongst respondents who had at least one sexual partner over the past twelve months, the proportion of respondents who know that HIV infection is not possible by kissing is the same amongst those who had only one partner (73.6%) as it is amongst those who had more than one sexual partner (72.3%, n.s.). Similar findings are made for touch and all other knowledge indicators across different categories of sexual activity.

Table 42: Correct answers to knowledge questions by prevention behaviours (%)

PREVENTION BEHAVIOUR UNDERTAKEN	HIV CAUSES AIDS			HIV CAN BE PASSED ON BY TOUCHING			HIV CAN BE PASSED ON BY KISSING		
	Yes	No	Don't know	No	Yes	Don't know	No	Yes	Don't know
Changed behaviour over last few years as response to HIV/AIDS (n=7089)									
Yes	78.9	5.0	16.0	89.2	5.3	5.5	73.9	10.4	15.6
No	73.4	3.3	23.3	83.0	4.9	12.1	66.3	11.5	22.1
		p<0.0001			p<0.0001			p<0.0001	
Condom use – last sex * (n=4558)									
Yes	86.4	3.6	11.0	93.9	3.4	2.7	80.2	7.8	12.0
No	77.2	3.8	19.0	87.4	5.1	7.5	71.0	12.0	16.9
		p<0.0002			p<0.0001			p<0.0002	
Discussed HIV prevention with partner * (n=4558)									
Yes	85.3	3.8	10.9	91.9	3.8	4.3	77.1	9.0	13.9
No	70.5	3.6	25.9	85.2	5.8	9.0	68.2	13.7	18.1
		p<0.0001			p<0.0001			p<0.0002	

** On population of respondents who had at least one sexual partner over the past 12 months*

Whilst knowledge of HIV/AIDS appears to have no direct bearing on sexual activity, it does correspond with prevention behaviours.

The above table, beginning with row one, should be read thus: Of those who report that they have changed their behaviour over the last few years as a response to HIV/AIDS 78.9% believe that that HIV causes AIDS, 5% disagree that HIV causes AIDS and 16% 'don't know'; and of those who report that they have not changed their behaviour 73.4% believe that HIV causes AIDS, 3.3% disagree that HIV causes AIDS and 23.3% 'don't know'. The chart should be similarly read for the other column headings (kissing and touching) and for the other row headings (condom use and discussion of prevention with partner).

It is important to note that the difference between those who practice prevention behaviours and those who do not is not accounted for by different levels of explicitly incorrect knowledge (levels in both are generally low). Rather it can be attributed to the larger number of 'don't know' responses amongst those who do not practice prevention behaviours. For example the proportion of those who do not believe that HIV causes AIDS is not significantly different if one compares those that report behaviour change and those that do not (5% and 3.3% respectively), but there is a markedly higher number of uncertain responses amongst the 'non-changers' (23.3% as opposed to 16%). A similar pattern pertains to the other knowledge and behaviour items.

Correct, unequivocal knowledge that HIV causes AIDS, and that HIV is not transmitted through touch and kissing is strongly associated with self-reported behaviour change over the past few years as a response to the risk of HIV infection, condom use in the last sexual experience and discussion of HIV prevention with a partner.

3.6.4 Attitudes and stigma towards people living with HIV/AIDS

Knowledge of HIV/AIDS and its relation to attitudes toward PLWAs
Attitudes to PLWAs were assessed using a series of items measured along a five-point Likert scale ranging from 1 = strongly agree to 5 = strongly disagree or vice versa. The items are: 'I will sleep in the same room as someone with HIV/AIDS', 'I will share a meal with someone who is HIV positive', 'I will talk to someone with HIV/AIDS', 'I will treat a family member with HIV/AIDS well' and 'I will not get infected by being in the same room as an infected person.'

Attitudes and stigma towards PLWA are strongly linked with knowledge of HIV/AIDS. Table 43 shows how the composite knowledge scale is related to each of the attitude items.

Respondents who would agree or strongly agree to sleeping in the same room as someone with HIV/AIDS, to sharing a meal with PLWA, to talking to an infected person or who would be inclined to treat well a family member who is a PLWA, had significantly higher scores of knowledge than others ($p<0.001$).

Relationship between various socio-demographic variables and attitudes to PLWAs
A composite scale of attitudes was developed by assigning a score to respondents who agree or strongly agree with each of the above statements. Each respondent was thus

Table 43: Mean score of knowledge scale by attitudes towards PLWAs (n=7089)

	AGREE	NEUTRAL	DISAGREE	p
Sleep in same room as PLWA	3.86	2.38	2.94	p<0.0001
(SD)	(0.03)	(0.15)	(0.10)	
Share a meal with PLWA	3.91	2.62	3.13	p<0.0001
(SD)	(0.03)	(0.11)	(0.08)	
Talk to PLWA	3.75	1.52	2.97	p<0.0001
(SD)	(0.03)	(0.20)	(0.18)	
Treat a family member well who is a PLWA	3.76	1.73	3.17	p<0.0001
(SD)	(0.03	(0.15)	(0.15)	
Not being infected by being in same room than PLWA	3.85	2.04	3.15	p<0.0001
(SD)	(0.02	(0.17)	(0.12)	

assigned a score of stigma on a scale from 0 to 5. The higher the score the more positive are attitudes towards PLWAs. The results obtained are shown in the table below.

Results reflect similar patterns to the results for knowledge. Regarding age of respondents, those in the oldest category are the most stigmatising of PLWAs, followed by the youngest age group (12–14). The 25–49 year old group are the most accepting.

The higher the education level of respondents the more positive are their attitudes towards PLWAs. Respondents from urban areas, whites and Indians and employed people tended to have more positive attitudes. Also, higher economic status was linked with less stigmatisation towards infected person. More personal involvement with HIV/AIDS (by having had an HIV test, by knowing one's partner's status, or by knowing someone who is HIV positive) was also linked to greater acceptance of PLWAs.

Regarding individual attitude items, the following were some of the more notable findings:

Table 44:Attitude scores by respondent characteristics, South Africa 2002

		n	score	SD	F
Gender	Male	3028	4.30	0.04	P >0.64
	female	4061	4.27	0.03	
Age	15–24	2432	4.38	0.04	P<0.0001
	25–49	3139	4.41	0.04	
	>49	1518	3.92	0.07	
EA type	Rural	1475	4.03	0.03	P<0.0001
	Urban	486	4.47	0.05	
Race	African	4214	4.30	0.03	P<0.0001
	White	679	4.45	0.07	
	Coloured	1359	3.96	0.09	
	Indian	837	4.38	0.08	
Education level	No school	694	3.37	0.11	P<0.0001
	Primary	1664	4.18	0.05	
	High	2816	4.46	0.03	
	Matric	1343	4.58	0.04	
	Tertiary	562	4.65	0.08	
Employ-ment	Yes	2445	4.44	0.05	P<0.0001
	No	4644	4.21	0.03	
Household situation	Not enough	2975	4.14	0.03	P<0.0001
	Just enough	2558	4.37	0.04	
	Most things	1120	4.50	0.06	
	Extra money	436	4.53	0.09	
Friend HIV+	Yes	852	4.62	0.05	P<0.0001
	No	6237	4.24	0.03	
Marital status	Married	2855	4.25	0.05	P=0.26
	Single	4228	4.31	0.03	
HIV test	Yes	1665	4.66	0.03	P<0.0001
	No	5424	4.19	0.03	
Partner	Know HIV status*	1078	4.60	0.04	P<0.001
	Don't know	3480	4.35	0.04	

** On population of respondents who had at least one sexual partner over the past 12 months (n= 4558)*

- 74.1% of respondents agree or strongly agree that they would be willing to share a meal with a person infected by HIV/AIDS
- 82.3% of respondents would be willing to sleep in the same room as a PLWA.
- Most respondents (94.3%) agree or strongly agree that they would be happy to talk to a person infected with HIV/AIDS.

3.6.5 Discussion

Better knowledge of HIV/AIDS has been shown to have a positive relationship to both prevention behaviours and positive attitudes to people with HIV/AIDS. This does not imply that knowledge is a sufficient condition of behaviour change and positive attitudes, but it is a necessary one. It is a precondition, and given that there are gaps in knowledge and segments of society that are not as well educated about the realities and risks of HIV/AIDS, it is important that HIV/AIDS knowledge not be seen as being universally high and satisfactory, as is often suggested in South Africa.

The flow of information and spread of knowledge about HIV/AIDS is not evenly spread across South African society. It seems that the sub-populations which show deficits in knowledge match the sub-populations with poorest media and communications programme coverage of HIV/AIDS. It is evident that the penetration of media and communications programmes is uneven in our society and matches a cluster of variables which are interrelated, including education, socio-economic status, place of residence (rural-urban) and race. In this context it is important that a more niche oriented and targeted approach to development of knowledge and information about HIV/AIDS be adopted. This implies a greater focus on interactive and community-level forms of information dissemination to areas that show a higher deficit of knowledge. The high levels of 'don't know' responses in response to some knowledge questions are indicative of a need for further unambiguous, simple and clear education messaging. Those who responded 'don't know' to knowledge questions are potentially reachable. On the other hand, it is likely that those who have definite incorrect beliefs about being cured of AIDS through sex with a virgin, or AIDS being caused by witchcraft are not as easily reachable. In such cases the beliefs may be based on cultural forms of understanding, which may be best addressed through engaging with opinion leaders and social structures that have influence in the cultural domain. Such beliefs have withstood informational education and may require more interactive means of address. It is also likely that recent debates in the country discussing the fact that HIV causes AIDS has produced unintended effects, including greater confusion about prevention needs in some subgroups of the population.

High levels of 'don't know' responses on knowledge questions amongst the child group (12–14) suggest a need to target this age group for HIV/AIDS education more intensively, especially since they are in the formative years for learning about sexuality. The education system is probably not meeting their HIV/AIDS knowledge needs, and this needs to be addressed in a concerted way. The knowledge of older people also shows deficits and they have particularly low exposure to more interactive forms of information, along with poorer mass media exposure.

In the case of HIV infection by breastfeeding, the high proportion of respondents that do not know with certainty that mother-to-child HIV infection can occur through

breastfeeding is probably because this has not been the subject of large public prevention campaigns, although it has been covered to some extent in news media reporting on the issue of mother-to-child transmission. Now that the prevention of mother to child transmission (PMTCT) is mandated by public policy, appropriate public education campaigns are urgently needed. This highlights the need for public education campaigns in relation to developments in prevention.

The results show that the majority of the South African population express attitudes of acceptance of PLWAs. Therefore, fear of stigmatisation should not be used as a rationale for inaction on the part of public and private policy and decision makers, regarding prevention and access to care for PLWAs. However, whilst stigma towards people is not widespread in the general population, there should still be concern about the minority who do have a clear tendency to stigmatisation. Even a small percentage is significant and will have a strong impact on the lives of people living with HIV/AIDS. The measures of stigma used in this study means that someone who registers as showing attitudes of stigma shows a fairly impactful form of stigma. Therefore these results should not provide reason to suggest that the battle against stigma is won, but rather that it requires a more focused approach emphasising care and endorsing existing positive attitudes to PLWAs and affected individuals and families.

3.7 Political and structural contextual issues

3.7.1 Political commitment and public recognition of HIV/AIDS

The international community considers leadership to be crucial in curbing the spread of HIV. For example, the United Nations General Assembly met in a special session in New York from 25 to 27 June 2001 to discuss the HIV/AIDS epidemic. The emerging declaration stated that, 'leadership by Governments in combating HIV/AIDS is essential' and also pointed out that the efforts of governments should be complemented by the 'full and active participation of civil society, the business community and the private sector.' They considered leadership to include both personal commitment and action. This is considered essential for a country to mount a credible national response to the HIV/AIDS epidemics, and UNAIDS encourages countries to achieve this.

Public perceptions regarding the extent to which South African leaders are considered to be politically committed to combat the epidemic were reviewed. This construct of political commitment was measured using three key public perception questions assessing the degree to which South African leaders (a) are committed to controlling HIV/AIDS, (b) publicly recognise the importance of HIV/AIDS, and (c) allocate sufficient resources to control the spread of HIV. Of course, questions on such matters should be considered as dealing with respondents' opinions. Therefore, they must be interpreted in the same way as answers to public opinion polls, as a measure that partially reflects the reality of social perception of the issues at stake. In particular, determinants (such as political preferences), which may not be directly related to the HIV/AIDS epidemic per se, may interfere (consciously or unconsciously) with respondents' answers. Figure 15 presents results showing that a majority (63.8%) of South Africans aged 15 years and above believe that the leaders of this country are 'committed' to controlling HIV/AIDS. But these perceptions vary substantially by race.

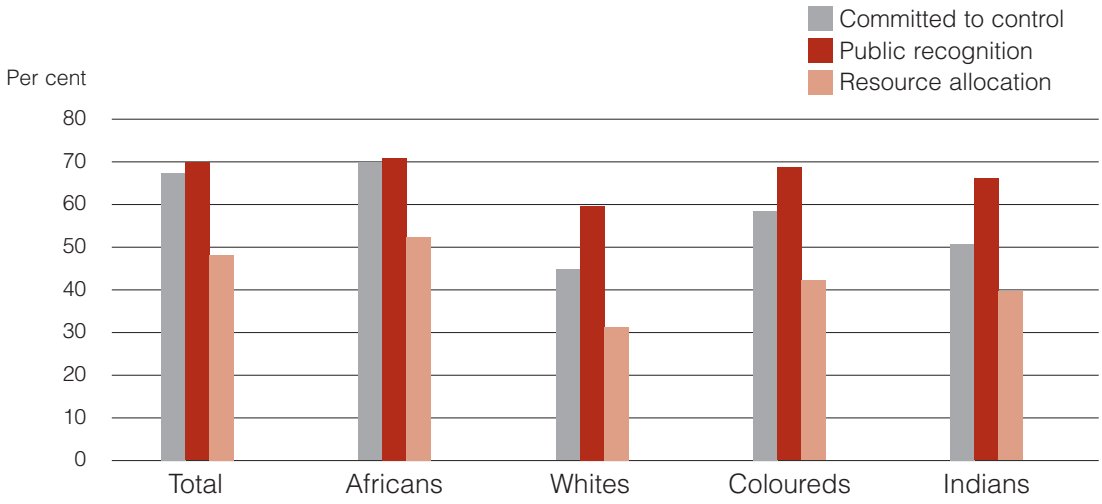


Figure 15: Public perceptions of commitment to dealing with AIDS and resource allocation by race, South Africa, 2002

While Africans are more likely to view leaders as committed to HIV/AIDS control, whites are more likely to perceive them as 'not committed'. Indians and coloureds are also less likely to perceive government as committed to AIDS control.

The majority of South Africans that consider political leaders recognise the importance of HIV/AIDS. Again, Africans are more likely to consider this to be so, followed by coloureds and Indians. Whites, compared to other groups are less likely to perceive leaders to publicly recognise the importance of HIV/AIDS.

When it comes to translation of that perceived commitment to action, only 47.5% of South Africans view the government as allocating sufficient resources to deal with the HIV/AIDS epidemic. Only half of Africans and 43.3% of coloured South Africans believed the government was allocating enough resources to tackle the epidemic, while whites and Indians were also less likely to perceive the allocation as adequate.

Public perceptions of the government's commitment to dealing with HIV/AIDS by province were also assessed. Table 45 summarises public perceptions regarding political commitments to HIV/AIDS. It shows variation of provincial public perceptions of political commitment to deal with HIV/AIDS. While overall, nearly 64% of South Africans perceived commitment, people in the Western Cape were divided on this matter. People in the Eastern Cape, Free State and Northwest mostly believed that there was commitment to fighting HIV/AIDS.

Furthermore, most residents in all nine provinces perceived that political leaders publicly recognised the importance of HIV/AIDS. However, political commitment, as seen above, should be backed by action. People in most provinces did not perceive the government to be allocating enough resources to combat HIV/AIDS. This was most pronounced in the Free State, Kwazulu/Natal, Western Cape, Eastern Cape and Gauteng Provinces. In only

Table 45: Public perceptions regarding political commitment to HIV/AIDS by province (%)

COMMITMENT	WC	EC	NC	FS	KZN	NW	GT	MP	LP	TOTAL
Political leaders are committed to controlling AIDS (%)	54.3	74.4	61.3	73.2	61.6	72.6	58.9	57.5	66.1	63.8
Political leaders publicly recognise the importance of HIV/AIDS (%)	65.5	75.0	71.7	72.1	68.6	76.9	64.9	55.7	68.6	68.9
Government allocates sufficient resources for AIDS control (%)	40.5	48.9	56.5	30.4	39.3	48.9	49.6	62.4	64.5	47.5

two provinces (Limpopo and Mpumalanga) the majority of residents perceived the government as allocating sufficient resources to manage HIV/AIDS.

3.7.2 Public opinion on access to antiretroviral therapy (ART)

Table 46 shows the findings regarding public perceptions of South Africans aged 15 and older on the government's provision of treatment for HIV/AIDS. Many public figures as well as AIDS activists in South Africa have already highlighted the need for the government to provide antiretroviral therapy for the prevention of transmission of HIV from mother to child, as well as provision of antiretroviral therapy to those medically eligible who are already afflicted with HIV/AIDS-related diseases. Nearly all South Africans are in favour of implementing these two public policies.

Table 46: Public perceptions (%) on the provision of ARV to prevent transmission of HIV from mother to child and provision of ARV to those living with the disease by race, South Africa 2002

	TOTAL	AFRICAN	WHITE	COLOURED	INDIAN
Should government provide ARVs for PMTCT					
Yes	96.5	96.7	93.0	97.7	98.2
No	2.1	1.7	5.8	1.2	0.9
No response	1.4	1.5	1.2	1.1	0.9
Total	100	100	100	100	100
Should government provide ARVs for those with HIV/AIDS-related illness					
Yes	95	95.7	87.7	96.6	96.4
No	3.5	2.7	11.2	2.3	2.8
No response	1.5	1.6	1.2	1.1	0.8
Total	100	100	100	100	100

3.7.3 Discussion

This section presented information on public perceptions of how the government is handling the HIV/AIDS situation in terms of political commitment, and whether perceptions of commitment are perceived to be translated into allocation of resources. Those who were previously most disadvantaged by the policies of the previous government were more likely to view the government as showing commitment to the problem of HIV/AIDS. However, the rest of South Africans (except the residents of Limpopo and Mpumalanga), perceive the government as not providing sufficient resources for tackling the HIV/AIDS problem. The fact that the overwhelming majority of people of all races believe that the government should provide ARVs to prevent transmission of HIV from mother to child and also to treat people living with HIV/AIDS, demonstrates the high level of awareness of South Africans on this issue. Recent public discourse on access to treatment for pregnant women and their newborns and the court case against the government have probably contributed to influencing public opinion on this matter. Clearly, if policy is to be informed by the public, the views of South Africans are unambiguous on this matter. The government has taken cognisance of these public perceptions as demonstrated by the Cabinet's statement of April 17 2002, which gave hope to South Africans about increased access to the programme to prevent mother-to-child transmission of HIV.

3.8 Access to media information on HIV and relationship of media exposure to knowledge and behaviour

This section examines exposure to media and information in relation to HIV/AIDS communication and is followed by an exploration of the relationship to knowledge and behavioural aspects. It focuses mainly on respondents aged 15 years and up, but includes reference to the 12–14 year old group where applicable.

3.8.1 Mass media exposure

Understanding of media exposure is important for planning HIV/AIDS communication campaigns. Table 47 shows child, youth and adult exposure to types of mass media by various modalities at a frequency of a few days per week or more. Radio is the most accessed medium, and has the highest exposure, followed by television, newspapers and magazines. Overall, there are high levels of exposure to broadcast media, although exposure to television is considerably lower in rural areas, informal urban areas and within poorer households. Print media exposure is low, with just over a third of youth and adult respondents having regular exposure. There are however higher levels of newspaper access in the 15–49 year age groups.

Table 47 illustrates the inter-relation between wealth, geographic location and mass media exposure, with poorer households and rural areas having considerably less regular exposure to all mass media channels.

3.8.2 Sources of HIV/AIDS information

Table 48 shows the rating of various media in terms of their importance as sources for HIV/AIDS information. This is relative to exposure to mass media channels – so

Table 47: Exposure to mass media a few days per week or more, South Africa 2002

MODALITY		RADIO	TELEVISION	NEWSPAPER	MAGAZINE
Age	n	%	%	%	%
15 and older	7089	80.1	66.2	29.1	25.7
15–24	2432	82.6	66.7	28.4	28.4
25–49	3139	82.6	70.1	33.4	29.4
50 and older	1518	72.4	58.1	21.6	15.2
Economic status (15+)					
Not enough money for basic things	2837	74.9	54.2	16.9	15.0
Have money for food and clothes, short on many other things	2531	83.2	69.0	29.6	26.4
Money for most important things	1120	87.0	90.0	57.5	48.3
Money for extra things	436	89.4	96.4	66.2	61.6
Locality type (15+)					
Urban formal	4313	84.1	85.3	43.3	37.5
Urban informal	815	75.3	55.5	20.3	14.8
Tribal area	1475	75.5	44.6	14.4	13.1
Farm	486	80.9	53.3	15.2	19.4

newspapers, for example, would naturally rate lower than television because of lesser exposure.

It should be noted that most mass media campaigns utilise a range of media types, with information being packaged so that synergies are achieved via multimedia approaches.

Radio is rated consistently higher than other mediums as informative for HIV/AIDS information and provides an indication of wider reach through the multilingual orientation of South African radio services. English is well catered for across all media, but print media fare less well across languages, and overall, African languages are particularly marginalized.

When respondents were asked whether they agreed with the statement 'There is not enough information in my own language', Afrikaans, Sotho, Tshivenda and Xitsonga speakers were more likely to agree than English and Nguni language speakers. It should also be noted that 60.2% of whites and 83.5% of coloureds have Afrikaans as a home

Table 48: Media informative/very informative for HIV/AIDS information, South Africa 2002

MODALITY	N	RADIO (%)	TV (%)	NEWSPAPER (%)	MAGAZINE (%)	LEAFLETS, BOOKLETS (%)
Age						
15 and older	7089	77.0	67.6	42.6	39.9	44.6
Language						
Afrikaans	1666	58.1	76.6	47.0	49.2	50.6
English	1278	63.6	82.1	68.0	63.2	64.4
Nguni languages	2339	84.9	63.5	40.2	36.0	42.2
Sotho languages	1424	78.0	65.0	36.9	35.7	40.0
Tshivenda & Xitsonga	267	80.8	60.8	35.6	29.2	37.5
Locality type						
Urban formal	4313	74.0	81.6	54.3	51.1	59.2
Urban informal	815	82.8	61.7	39.6	33.5	39.6
Tribal	1475	80.7	52.2	30.7	28.7	29.4
Farm	486	73.7	54.8	26.0	26.7	26.7

language, whilst 40% of Africans have Sotho languages, Tshivenda or Xitsonga as home languages and 57.2% have Ngoni languages as home lanaguages. English is the home language of only 0.8% of Africans.

3.8.3 Community level HIV/AIDS communication

Table 49 illustrates the general availability of HIV/AIDS information in formats other than broadcast and print mass media channels. Whilst rural areas are relatively less resourced,

Table 49: Exposure to HIV/AIDS information at community level, South Africa 2002

EA TYPE	n	RED RIBBON (%)	POSTERS (%)	LEAFLETS/ BRO-CHURES (%)	BILL BOARDS, SIGNS, MURALS (%)	AIDS PLAY (%)	COMMUNITY MEETING (%)
Urban formal	4313	84.9	67.6	67.7	60.5	28.1	22.5
Urban informal	815	78.8	59.0	59.3	53.3	28.3	27.4
Tribal	1475	70.3	49.7	45.8	41.3	23.2	22.4
Farm	486	72.5	43.5	45.2	39.6	6.9	14.8

levels of exposure do not differ markedly in comparison to other community types. Interactive approaches such as AIDS plays and community meetings about HIV/AIDS are important for supporting dialogue. Distribution of leaflets and posters can contribute to promoting community level dialogue, whilst wearing of the red ribbon may be used to indicate a personalised association with HIV. The red ribbon HIV/AIDS symbol was noted as a means for reminding people of HIV/AIDS, and achieved the highest recognition amongst all forms of community level information.

Table 50 shows other sources of HIV/AIDS information over the past year for child, youth and adult respondents. Children were most likely to receive HIV/AIDS information at school, whilst adults were more likely to receive information from a health facility. Health facilities rated highly across all ages, and were the most important source for HIV/AIDS information.

Faith-based organisations are an important source of HIV/AIDS information, being noted by children, youth and adults. There is a high level of engagement with spirituality and – when asked about religious beliefs, 88.3% of respondents aged 15 or older indicated that they were a member of a faith, with 63.6% saying that religion was very important to them.

Table 50: Other sources of HIV/AIDS information over past year, South Africa

Age	n=	Health facility (%)	School (%)	Parents (%)	Faith org (%)	Youth group (%)	AIDS org. (%)	Initiation school (%)	Sports club (%)
12–14	741	-	85.9	39.9	25.5	13.4	-	2.5	8.2
15–24	2432	68.4	75.7	54.8	39.4	36.5	21.2	8.5	21.2
25–49	3139	76.8	23.8	29.0	48.2	14.7	21.2	3.9	12.0
50+	1518	61.5	9.8	11.5	47.8	2.9	11.3	2.6	2.9

3.8.4 Telephone helplines

Telephone helplines are an important support system for dialogue, and allow callers to explore HIV/AIDS in terms of their own particular concerns. Table 51 shows the awareness of particular telephone helpline services that provide HIV/AIDS information. There was relatively high awareness amongst all groups of at least one service. The national tollfree AIDS helpline was consistently best known. Childline was identified by nearly half of 12–14 year old children. Amongst youth and adults, urban respondents were considerably more likely to note a helpline service than rural respondents. When the data was reviewed by locality type it was found that only 12% of rural children noted the availability of a helpline service.

Table 51: Awareness of telephone helplines providing HIV/AIDS information amongst those who knew of a helpline service, South Africa 2002

Age	n	AIDS helpline (%)	Childline (%)	Local Clinic/ Hospital (%)	Thetha Junction (%)	Lifeline (%)	Rape Crisis (%)
12–14	241	51.4	37.4	14.2	28.1	13.1	11.3
15–24	952	62.6	23.1	32.7	37.4	21.5	15.5
25–49	1122	62.1	25.6	38.4	33.3	28.6	24.4
50+	300	49.9	19.7	46.7	19.3	20.8	16.5
All	2615	60.0	24.0	37.4	33.1	25.2	20.4

3.8.5 Slogans and messages

Table 52 presents information on recall of slogans and messages. Respondents were asked to indicate which messages or slogans they could recall from HIV/AIDS campaigns. The unprompted, multiple responses were then coded into categories. This provides insight into the general recall of HIV/AIDS campaign orientation, as well as internalisation of messages. The most pervasive message related to condom use and this was prominent across all age groups. Limiting partner numbers, faithfulness and abstinence are in the mid-range of recall. The least emphasis was on religious or cultural values, care provision for people with HIV/AIDS, and rights of people with HIV/AIDS.

Table 52: Recall of slogans or messages, South Africa 2002 (%)

Age	n	Condom use	AIDS kills	Faithfulness	Abstinence	Number of partners	PWA rights	Helping care for PWA	Religious or cultural values
12–14	741	72.3	51.4	35.0	42.2	20.2	9.9	5.8	5.2
15–24	2432	90.8	57.3	57.5	49.8	35.1	14.5	9.8	6.6
25–49	3139	86.0	56.6	58.2	44.5	34.8	14.8	9.8	8.2
50+	1518	68.7	47.8	44.8	36.6	22.8	9.7	7.1	5.6

3.8.6 Information needs

Table 53 presents results from analysis of information needs of participants. In general it appears that South Africans have a good awareness of HIV/AIDS, and are regularly exposed to HIV/AIDS information via mass media and at community level. However, this

Table 53: Information needs by age, South Africa 2002, % (n)

INFORMATION NEEDS	15–24	25–49	50 +
Protecting young people from sexual abuse	90.4 (2422)	87.2 (3118)	77.8 (1491)
Talking to a partner about condoms (sexually active only)	87.7 (1368)	76.0 (3033)	65.1 (1425)
Blood donation and transfusion	80.0 (2388)	76.5 (3081)	65.0 (1476)
Getting an HIV test	84.0 (2398)	78.6 (3094)	69.2 (1474)
Getting counselling about HIV/AIDS	86.9 (2398)	81.1 (3093)	70.4 (1466)
Staying healthy if one is HIV positive	88.6 (2383)	84.5 (3088)	73.3 (1468)
Caring for a person who has AIDS	84.3 (4387)	81.6 (3092)	75.7 (1474)
Rights of people with HIV/AIDS	87.0 (2384)	82.7 (3079)	74.5 (1459)
Contact information on AIDS organisations	84.7 (2385)	79.7 (3073)	68.9 (1460)
Sexual abuse and rape	84.5 (2390)	79.1 (3081)	68.3 (1469)
Relationship problems	77.2 (2368)	70.9 (3063)	53.3 (1454)

does not appear to have translated into having sufficient detailed information about the disease. When asked about discrete areas of information need, most respondents expressed a need for further information.

3.8.7 Mass media relationship to context

Table 54 illustrates a range of contextual and mass media experiences in relation to taking HIV/AIDS more seriously. It was possible to cross-tabulate the variables of those who had direct exposure to a person with HIV/AIDS, with those who said they had taken the problem of HIV/AIDS more seriously in various categories. Respondents who knew someone who had died of AIDS or who had a relative who told them they were HIV positive, were more likely to have taken the problem of HIV/AIDS more seriously than those who were exposed to mass media.

Table 54: Distribution of responses to "What has made you take the problem of HIV/AIDS more seriously?" South Africa 2002

SUBCATEGORY OF RESPONDENTS	RANK %	CATEGORY
Of those who knew someone who had died of AIDS (n=480)	65.4	... said they had taken the problem of HIV/AIDS more seriously because they knew someone who has died of AIDS
Of those who had a relative or friend who told them they were HIV positive (n=116)	52.7	... said they had taken the problem of HIV/AIDS more seriously because they knew someone with HIV/AIDS
Of respondents who watched television a few days of the week or more (n=5047)	56.6	... said they had taken the problem of HIV/AIDS more seriously because of television programmes on HIV/AIDS
Of respondents who listened to the radio a few days of the week or more (n=5728)	52.0	... said they had taken the problem of HIV/AIDS more seriously because of radio programmes on HIV/AIDS
Of all respondents (n=7089)	40.0	... said they had taken the problem of HIV/AIDS more seriously because of AIDS statistics
Of respondents who read a newspaper a few days of the week or more (n=2396)	30.4	... said they had taken the problem of HIV/AIDS more seriously because of articles in newspapers on HIV/AIDS
Of respondents who read a magazine a few days of the week more(n=2162)	31.7	... said they had taken the problem of HIV/AIDS or more seriously because of articles in magazines on HIV/AIDS
Of those who had attended a workshop on HIV/AIDS (n=882)	25.9	... said they had taken the problem of HIV/AIDS more seriously because they had attended a workshop or training programme on HIV/AIDS

3.8.8 Reported behaviour change in relation to media and contextual factors

Table 55 below provides examples of behaviours and practices that may be considered as having been internalised via communication campaigns. Condom use, consideration of HIV testing, and adopting particular prevention strategies, faithfulness and condom use rated highly amongst steps taken, but HIV testing was only suggested by a small proportion of respondents. There was however a strong response in relation to HIV risk in multi-partner relationships. Respondents with more than one current partner were significantly more likely to use a condom in their last intercourse, than those with only one current partner.

3.8.9 Discussion

- It is of concern that regular exposure to broadcast media is low in rural areas and poorer households. For this reason additional communication approaches for reaching these vulnerable population need to be emphasised.
- Print media is clearly less accessible and consequently less useful as a medium for conveying HIV/AIDS information to rural communities and poorer households.

Table 55: Behaviours and practices by age, South Africa 2002 % (n)

BEHAVIOUR/PRACTICE	15–24	25–49
Ever used a condom (n=sexually active)	68.7 (1382)	51.2 (3073)
Last intercourse condom use (n=sexually active)	51.6 (1382)	24.2 (1382)
Last intercourse condom use (n=those with one current partner)	51.1 (991)	23.3 (85)
Last intercourse condom use (n=those with more than one current partner)	59.4 (96)	45.4 (97)
If you do not know your HIV status would you consider going for an HIV test	46.4 (1382)	35.9 (3073)
In the face of HIV infection, have you changed your behaviour in the past few years? (n=sexually active)	62.4 (1382)	45.8 (3073)
If yes, I have only one partner and am being faithful (n=sexually active)	75.1 (567)	79.6 (1042)
If yes, I always use condoms (n=sexually active)	53.7 (412)	32.4 (421)
If yes, my partner and I have had an HIV test (n=sexually active)	4.2 (19)	4.6 (59)

- Print media is constrained by being less adaptable for multilingual communication, and those with an African home language found print media less useful for HIV/AIDS information.
- Multilingual access to information is of concern, and Afrikaans, Sotho, Tshivenda and Xitsonga speakers are considerably marginalised in relation to HIV/AIDS information via mass media channels. Although English is the dominant language used in many mass media campaigns, it is a matter of concern that only 0.8% of Africans have English as a home language, followed by 15.5% of coloureds and 38% of whites.
- There are relatively high levels of exposure to community level media in rural areas, for example, leaflets and posters, with the latter being more pervasive than television in these areas.
- Health facilities emerge as an important source for information, and present an important option for addressing HIV/AIDS along the continuum of prevention, care and support. Schools are also an important entry point for children and youth. The relatively lower orientation of AIDS organisations suggests that useful partnerships could be developed between these organisations and health facilities. Faith-based organisations are also an important resource and partnerships between AIDS organisations, faith-based organisations and health facilities may offer promise. Youth groups and sports clubs have a relatively higher orientation for child and youth age groups, and interactions between these formations for youth audiences should be considered.

- Whilst actual use of telephone helplines was not assessed, there is a relatively high awareness of the availability of this type of service. Helplines allow for dialogue in relation to HIV/AIDS and are most successful at addressing myths and misconceptions, as well as providing counselling or referring callers to appropriate services.
- Recall of slogans and messages was relatively high, and it is clear from the condom use data that condom messages have been well internalised. This correlates strongly with actual condom use.
- 'AIDS kills' was the second most frequent 'message' recalled. Interestingly, no national level mass media campaigns have promoted messages that have incorporated 'AIDS Kills' messages, as it has been felt that such messaging is excessively fear-based, and also may contribute to the PLWHAs being stigmatised. It is clear however, that the fatal nature of AIDS has been internalised and the general perception is that AIDS does indeed lead to death.
- Although there is a general awareness of HIV/AIDS, most respondents still require further and more detailed information. This suggests that mass media campaigns are insufficient as systems of delivery, and other communication channels, particularly dialogue-oriented approaches should be considered.
- There appears to be a trend toward taking the problem of HIV/AIDS more seriously by those knowing someone who was HIV positive or who had died of AIDS. This in turn is linked to purported behaviour change, although a deeper exploration of this data is necessary. Current findings do however have implications for interventions that promoted care and support of people living with HIV/AIDS and families affected by the disease.
- The South African HIV/AIDS and communication environment is a complex one and there are literally thousands of purposive and non-purposive communication activities that take place at national, provincial and local level. It is complex to reduce behaviour, attitudes or knowledge to specific interventions – whether they are mass media, community level communication or interpersonal communication. It is clear however, that risk reducing behaviours and practices described elsewhere in this study are the net product of HIV/AIDS communication of one kind or another, led by purposive campaigns, but also disaggregated to a range of other purposive and non-purposive communication activities.
- Respondents have clearly taken note of key aspects of HIV transmission, and have internalised this understanding in their own behaviours and practices. Condom use during last sex act amongst youth is high, with half of respondents doing so, and is significantly higher amongst respondents with more than one current partner. It must be noted however, that condom use is not simply a matter of communication. Effective and appropriate service provision and condom quality are the foundations of an effective communication promoting condom use.
- In relation to condom use it must be noted that 'behaviour change' may not have been necessary. As younger individuals may have started their sexual lives adopting particular strategies, for example condom use, and might not need to 'change their behaviour'. Similarly, respondents in long-term relationships may have not needed to change their behaviour because they have been monogamous and faithful over a long period of time.
- HIV testing was considered as an option by half of all youth who had not had an HIV test, as well as by a third of adults, and is something that can be capitalised upon when introducing and promoting voluntary HIV counselling and testing programmes.

4. Conclusions and Recommendations

South Africa has a serious and widespread HIV/AIDS epidemic. For the country to respond effectively, preventing new infections and providing care and treatment to those who are already living with HIV/AIDS, it is vital to have accurate data and a comprehensive understanding of the epidemic. To overcome the challenge of HIV/AIDS requires that the recommendations listed below be considered seriously.

This study is the first systematically sampled national survey of the prevalence of HIV and behavioural risk, coupled with mass media and communication impacts in South Africa. The findings provide important insights into understanding HIV risk and risk reduction as well as informing a continuum of intervention and policy in relation to prevention, care, and support. The findings also provide clearer guidelines in relation to prevention of new infections, and care and treatment for people living with HIV/AIDS. It also provides information necessary for ameliorating the impact of HIV.

This study confirms many of the findings of smaller scale, sectoral studies of HIV prevalence and yields insight into the interpretation of antenatal HIV prevalence data. The study also confirms findings made in other studies that have examined behaviour, communication and service provision, as well as contributing new knowledge (noting limitations as outlined in Section 2.13).

In the following recommendations, reference is made to the findings in relation to: HIV prevalence; gender; HIV/AIDS communication; knowledge and awareness; prevention; treatment, care and support; and implications for research, monitoring and evaluation.

HIV Prevalence

The study found that HIV/AIDS affects all race groups in South Africa. The differences in rates of infection are largely due to social and behavioural determinants, such as living in informal settlements, access to information and education necessary for prevention, knowing people who have HIV/AIDS or died due to AIDS, and multiple partnerships, as well as having a sexually transmitted infection. Although HIV prevalence amongst race groups differs, as does prevalence among males and females, and prevalence in various types of locations, curbing the impact of the epidemic requires intensification of prevention and care efforts across the board. This includes committing funds to employ more health personnel, ensuring capacity building for activities in key response areas and expanding service provision. The South African Cabinet's Statement of April 17 2002 that "the total budget ... R350 million in 2001/02 ... has been increased to R1 billion in this financial year and ... to R1.8 billion in 04/05" gives hope that financial resource allocation is taken seriously. Allocation of these resources equitably and appropriately along the continuum of prevention, treatment, care, support and rights is critical.

HIV prevalence among persons aged 2–14 years was much higher than expected. It could not adequately be explained by heterosexual nor by vertical transmission. This finding requires further investigation. Thus, it is recommended that a detailed study be undertaken to explore the finding, examining the role of sexual abuse and nosocomial infection (health service acquired infections). This factor was alluded to recently by the World Health Organisation's model which estimates that at least five percent of all HIV infections are due to unsterile needles and that it is difficult to estimate this figure.

Gisselquist et al. (2002) estimate that 20–40 per cent of HIV infections cannot be explained by mother-to-child transmission or heterosexual transmission, but may be due to inadequate medical care.

Gender

This study has demonstrated that women have higher HIV prevalence than men. There are biological and social reasons for this difference. Women's reproductive systems make it easier for them to be infected with HIV, and men themselves are more effective at transmitting HIV. Men's semen is more infectious than vaginal fluids because of its cellular content, and HIV needs live cells in order to be transmitted. Furthermore, women are more likely to have undetected sexually transmitted infections. However, biology alone does not explain the imbalances in prevalence between men and women. We have to consider the interaction between gender and biological factors to understand how women and men may be at increased risk because of gender construction. Among these are: the deep-seated emphasis of multiple sexual partners for men; male control over barrier methods; and women's economic situation which make them and their families dependent on men (see Shisana 1999). It is recommended that first, a short-term strategy of gender mainstreaming be considered. For example, the current prevention of mother-to-child (PMTCT) programmes should be made more gender sensitive through encouraging partner counselling and testing. Second, a medium- and long-term strategy would be for emphasis to be given to the economic and social empowerment of women in relation to exercising their sexual rights. It is recommended that consideration of gender issues, including gender-related vulnerability to HIV infection, as well as vulnerabilities and imbalances that exist for female PLWAs be integrated into HIV programming.

HIV/AIDS communication, knowledge and awareness

Overall levels of awareness and knowledge of key aspects of HIV/AIDS are good in South Africa. There are however important areas of concern that need to be addressed. These include:

- Purposive campaigns utilising mass media, as well as responses to HIV/AIDS in the news media, should be oriented towards understanding and addressing HIV/AIDS information needs correctly and directly. This requires regular monitoring of research, addressing myths and misconceptions, and building linkages with HIV/AIDS service providers and organisations working at community level. Steps should be taken to address areas of poor and incorrect knowledge – for example, uncertainty with regard to the virgin myth, the causal relationship between HIV and AIDS, HIV transmission and kissing, amongst others.
- Telephone helplines in particular provide opportunities to increase understanding of information needs, and it is recommended that resources be committed to monitoring, analysing and evaluating telephone helpline services.
- Lower levels of access to mass media channels in rural communities and poorer households should be noted. Addressing these limitations necessitates investment in community level communication approaches which build on the resources of local health services as well as fostering linkages and partnerships with faith-based organisations, HIV/AIDS organisations and sectoral organisations. There is a need to support communication systems that allow for interactive communication, and

community-based health services. HIV/AIDS organisations and sectoral organisations are best positioned to provide such support. It is recommended that interactive communication approaches and community level organisations be supported.

- Noting the relative marginalisation of African languages and Afrikaans, it is recommended that closer attention and emphasis be given to multilingual approaches – specifically communicating in the home language of intended audiences. Given that media is a powerful influence that makes people take HIV/AIDS seriously, television, radio, billboards and leaflets should be presented in home languages of intended audiences to ensure they are understood
- The red ribbon symbol is widely noted as an important reminder of HIV/AIDS and it is recommended that the red ribbon continue to be integrated into all HIV/AIDS campaigns.
- Given that South Africans experience HIV/AIDS along a continuum of prevention, care, support and rights, it is recommended that campaigns emphasise all aspects of the epidemic, including, for example, voluntary counselling and testing, nutrition, treatment, home-based care, laws and rights.

Prevention

The current South African national HIV/AIDS strategy includes emphasis on:

- Promoting safe and healthy sexual behaviour.
- Improving the management and control of STIs
- Providing voluntary counselling and testing
- Addressing issues related to blood transfusion and HIV
- Reducing parent mother-to-child HIV transmission (PMTCT)
- Providing appropriate post-exposure services

Table 39 compares results of the present household study with findings in the South African Demographic and Health Survey of 1998, and provides valuable insights into behavioural shifts over time. Important trends identified when comparing behavioural responses of women aged 15–49 years include a greater proportion of women in 2002 having no sexual partner in the past 12 months; and greater proportions of women in 2002 having used a condom at last sexual intercourse.

- Sexual activity amongst young people should continue to be given attention. It is promising that only a small proportion of young people under 14 years report sexual activity, and only a quarter of 15–17 year olds are sexually active. When referencing young people in relation to HIV status however, infection levels are high, and urgent further research is necessary to explore child sexual abuse, statutory rape, sexual coercion, and age differentials between partners.
- Overall behavioural trends regarding condom access and use indicate important progress in this regard. The national condom promotion and distribution system should continue to be resourced. Specific attention should be given to provinces where condom use and access is lower.
- The observation that people (15–49 years) living in informal settlements have the highest HIV prevalence (28.4%) compared to those who live in urban formal areas (15.8%) and those in rural areas (12.4%%), leads to the recommendation that HIV/AIDS prevention programmes be intensified for people living in informal settlements. Apart from solving structural problems (i.e. poor housing conditions),

it is critical that prevention programmes in these areas focus on reduction of multiple partnerships, which are often associated with the transient nature of life in informal settlements. The rate of multiple partnerships is higher (23.5%) among those living in urban informal areas than among those who live in tribal areas (19.2%) and urban formal areas (10.2%).

- Awareness of STI services is good and service provision is well regarded. The finding that there is a strong relationship between HIV and STIs is worth noting. Both public and private health care facilities should be encouraged to adhere strictly to all the requirements of the syndromic management approach for the treatment of STIs, as is endorsed by the national Department of Health.
- Awareness of VCT services is relatively low, and although one in five South Africans had had an HIV test, this was mainly as a result of testing in the context of insurance, or of pregnancy. Promotion of personal motivation for VCT should be prioritised, and VCT service promotion should emphasise confidentiality. Concern also exists in relation to promotion of VCT services in relation to disclosure of HIV status to partners, family members and communities. Further research is recommended in this area. It is however recommended that partner counseling and provision of training and resources to post-test clubs, such as those pioneered in Uganda, be considered.

  It is recommended that: (a) prevention campaigns should include a drive to encourage VCT, noting that such promotion has benefits for prevention, as well as care and support for persons who are HIV positive; (b) counselors should be trained to impart knowledge to those living with HIV/AIDS, including issues related to prevention, treatment, partner counseling and relationships; (c) in addition there should be treatment of opportunistic infections, provision of nutritional education and supplementation coupled with healthy living. Given that a large percentage of South Africans are living with HIV/AIDS, it is crucial that this comprehensive care package be made available as aroutine matter for those for whom it is medically indicated.

  It is further recommended: (a) there should be a dramatic expansion of VCT services, especially in those provinces such as the Eastern Cape where there are currently only a few sites available and (b) urgent consideration should also be given to accreditation of VCT training programmes for both health professionals as well as lay consellors.
- It is further recommended that voluntary counselling and testing services be improved to focus also on those people who are living with HIV/AIDS. This study found that only 33% of those who were sexually active in the last twelve months, and were were HIV positive and aware of their serostatus, used a condom in the last sex act, meaning that 67% did not. In other studies it has been shown that people who are HIV positive and know their HIV status, do not always use a condom (1.2% consistent condom use in sero-discordant pairs as reported in Gisselquist et. al [2002]). For this reason, it is critical that HIV/AIDS campaigns also focus on those who are currently living with HIV/AIDS, to ensure that they do not get reinfected with different strains of the virus and do not also infect their partners. More HIV positive persons can be encouraged to take up voluntary counseling and testing if antiretroviral therapy is offered.
- There is also a need for campaigns that focus on reducing stigma and encouraging care for PLWAs. These campaigns should be directed at community leaders such as traditional leaders, NGOs, FBOs, to create a framework of support necessary for

such disclosure to occur. Direct support should be given to the development of support systems for HIV disclosure within relationships, the family and communities. However,this should only be encouraged in contexts where support systems are in place, and where steps have been taken to ensure that violence does not occur in response to HIV/AIDS disclosure.

- Issues related to transmission of HIV via blood, PTMCT, and post-exposure prophylaxis were not closely assessed in this study. However, knowledge of HIV transmission via breastfeeding was poor and this should be emphasised in relation to PMTCT interventions, and further research is recommended in this area.

Treatment, Care and Support

The national strategy includes emphasis on:

- Providing treatment, care and support services in health facilities. This includes improving treatment, care and support for people living with HIV/AIDS; improving prevention and treatment of tuberculosis and other opportunistic infections; and establishing poverty alleviation projects to address the root causes of HIV/AIDS, STIs and TB;
- Providing adequate treatment, care and support services in communities. This includes developing and implementing models of home and community-based care; and increasing knowledge in communities regarding care and support.
- Developing and expanding the provision of care to children and orphans. This includes developing and implementing programmes to support the health and social needs of children affected by HIV/AIDS.

Many aspects of treatment, care and support were not directly addressed in this study. Attention is however drawn to the high levels of public support for provision of antiretroviral therapy and PMTCT. Current efforts of the Department of Health and the Treasury to cost the provision of antiretroviral therapy may need to be fast-tracked and funds allocated to prolong the lives of those who are living with HIV/AIDS. The Cabinet's statements of 17 April 2002 that antiretroviral therapy "could help improve the conditions of PLWHAs if administered at certain stages in the progression of the condition, in accordance with international standards," was a statement welcomed by the public and community, although the concern about costs also needs to be noted. It is crucial that the government uses the gains it made in winning the case against pharmaceutical companies to produce generic versions of antiretroviral drugs. South Africa has the capacity to produce drugs to treat its people and even export them to neighbouring countries. It is important that the government remove value added tax (VAT) from medicines, to increase affordability of these medicines. Such moves, that include increased financial and human resources and access to affordable medicines, will go a long way to convince South Africans, who in this study have indicated that the government has commitment to deal with HIV/AIDS, but perceive that it is not allocating sufficient resources to tackle the epidemic.

- Given the widespread support for the government to provide anti-retroviral (ARV) therapy to PLWAs, as was found in the present study, it is recommended that the government should roll out an ARV programme both for PMTCT and all PLWAs as soon as possible. Promotion of basic treatment, including treatment of opportunistic

infections is also vital. In addition, health providers should be trained and resourced to provide the necessary support to PLWAs. Such steps would lie at the heart of a successful national response to the HIV/AIDS epidemic and are in line with recent Cabinet statements on the issue in April and October 2002. Such a bold decision would have a ripple effect on other aspects of the comprehensive HIV/AIDS/STIs prevention, treatment, and care programmes currently run by the national Department of Health, especially regarding non-discrimination toward PLWAs and affected families, as well as risk reduction programmes.

- Data gathered in relation to HIV/AIDS and social conditions of children are not presented in detail in this report. These findings will be presented in 2003. However, the finding that 13% of children had lost a mother or father from all causes of death, and that 3.3% of households in South Africa are headed by children, leads to the recommendation that the government and NGOs need to galvanise support for orphaned and vulnerable children. This could include helping the OVC to obtain child care grants, encouraging people to foster these children, and helping them to retain assets and to remain in school after the death of their parents.

Research, monitoring and evaluation

This study has demonstrated that it is possible to undertake a national household survey to determine the HIV prevalence in different race, sex, and age groups, as well as geographical locations and provinces. The experience demonstrates the viability of continued regular surveys of this kind, and it is recommended that such studies be carried out at least biennially, both for policy and planning purposes and for carefully tracking the epidemic. This will allow interventions to be directed towards specific segments of the population that need them most. The following main indicators should be used to track the national response: (a) the proportion of the population by age, sex, race, location type and province with recent HIV infections; (b) HIV prevalence by these five demographic variables; (c) for those sexually active in the past year, condom use during the last sexual act; (d) condom use during the last sex with non-regular partner; (f) the proportion of the population with more than one concurrent partner; (h) the proportion of the population that underwent voluntary counseling and testing and are aware of their HIV status, coupled and related to their condom use; (i) the proportion of the population that is HIV positive and have dependent children under 15 years; (j) the proportion of orphans and child-headed households; and (k) the proportion of the population that has taken AIDS seriously as a result of specific events, such as exposure to media information on HIV/AIDS, death of PLWA or knowing someone with AIDS.

Appendices

Appendix A1

Table A1: HIV prevalence rates, socio-demographic characteristics, coefficient of variation, and the design effect (Valid Findings)

Variable	count	n	Response rate	Prevalence Rate (r)	SE_r	CV_r	Deft	Deff
Total	13518	8428	62.3%	11.4%	0.7%	0.06	1.95	3.79
Children	3730	2348	62.9%	5.6%	0.9%	0.17	2.00	4.01
Youths	3457	2099	60.7%	9.3%	1.0%	0.11	1.57	2.45
Adults	6331	3981	62.9%	15.5%	1.0%	0.06	1.75	3.07
EC	1875	1221	65.1%	6.6%	1.1%	0.16	1.49	2.22
FS	805	540	67.1%	14.9%	2.7%	0.18	1.75	3.05
KZN	2644	1579	59.7%	11.7%	1.8%	0.15	2.20	4.82
NW	1042	626	60.1%	10.3%	1.8%	0.17	1.44	2.08
GP	2139	1272	59.5%	14.7%	1.7%	0.12	1.73	3.00
MP	1030	550	53.4%	14.1%	2.2%	0.16	1.48	2.20
Urban formal	8308	5098	61.4%	12.1%	0.9%	0.08	2.03	4.12
Urban informal	1387	841	60.6%	21.3%	2.6%	0.12	1.83	3.36
Rural formal	2969	1906	64.2%	8.7%	1.1%	0.13	1.74	3.04
Males	6309	3772	59.8%	9.5%	0.8%	0.08	1.67	2.79
Females	7209	4656	64.6%	12.8%	0.9%	0.07	1.91	3.66
Africans	7802	5056	64.8%	12.9%	0.8%	0.06	1.76	3.08
Coloureds	2609	1775	68.0%	6.1%	0.8%	0.14	1.47	2.16
Youth – Urban formal	2026	1230	60.7%	9.3%	1.4%	0.15	1.65	2.71
Adult – Urban formal	4056	2478	61.1%	15.7%	1.5%	0.10	2.04	4.18
Adult – Urban informal	668	419	62.7%	28.6%	3.5%	0.12	1.59	2.54
Adult – Rural formal	1214	789	65.0%	12.8%	1.7%	0.13	1.39	1.94
Youth – Male	1651	976	59.1%	6.1%	1.1%	0.18	1.46	2.13
Youth – Female	1806	1123	62.2%	12.0%	1.4%	0.12	1.46	2.14
Adultv – Male	2776	1609	58.0%	14.4%	1.4%	0.10	1.62	2.64
Adult – Female	3555	2372	66.7%	16.2%	1.3%	0.08	1.78	3.17

Variable	count	n	Response rate	Prevalence Rate (r)	SE_r	CV_r	Deft	Deff
Youth – African	2096	1320	63.0%	10.2%	1.1%	0.11	1.38	1.90
Youth – Coloured	649	427	65.8%	6.4%	1.0%	0.15	0.83	0.69
Youth – Indian	411	223	54.3%	0.3%	0.0%	0.06	0.05	0.00
Adult – African	3519	2318	65.9%	18.8%	1.3%	0.07	1.60	2.55
Adult – Coloured	1168	812	69.5%	6.7%	1.1%	0.17	1.30	1.69
Adult – Indian	770	424	55.1%	2.3%	0.4%	0.17	0.53	0.28

Abbreviations: n = number of cases in the sample, r = response rate, SE_r = standard error of the response rate, CV_r = coefficient of relative covariation, Deft = design factors (square root of Deff), and Deff = design effect.

Appendix A2

Table A2: HIV prevalence rates, socio-demographic characteristics and the coefficient of variation, and the design effect (substantive findings)

Variable	count	n	Response rate	Prevalence Rate (r)	SE_r	CV_r	Deft	Deff
WC	1809	1267	70.0%	10.7%	2.2%	0.20	2.49	6.22
NC	913	694	76.0%	8.4%	1.7%	0.20	1.59	2.51
LP	1261	679	53.8%	9.8%	2.0%	0.20	1.71	2.93
Tribal	854	583	68.3%	7.9%	1.6%	0.20	1.41	1.98
Children – urban formal	2226	1390	62.4%	6.2%	1.6%	0.27	2.55	6.50
Youth – urban informal	360	197	54.7%	20.2%	4.0%	0.20	1.39	1.92
Youth – rural formal	832	524	63.0%	7.0%	1.6%	0.22	1.40	1.97
Adult – tribal	393	295	75.1%	9.5%	1.9%	0.20	1.11	1.24
Children – African	2187	1418	64.8%	5.4%	1.1%	0.20	1.82	3.32
Children – males	1882	1187	63.1%	5.2%	1.1%	0.20	1.63	2.65
Children – coloured	792	536	67.7%	4.8%	1.1%	0.24	1.24	1.54
Children – rural formal	923	593	64.2%	5.2%	1.4%	0.27	1.25	1.55
Children – female	1848	1161	62.8%	5.7%	1.6%	0.27	2.27	5.15
White	1511	701	46.4%	6.2%	1.5%	0.25	1.69	2.86
Children – Indian	415	249	60.0%	0.9%	0.3%	0.29	0.44	0.20
Adults – white	874	427	48.9%	5.7%	1.5%	0.27	1.35	1.83

Appendix A3

Table A3: HIV prevalence rates, socio-demographic characteristics and the coefficient of variation, and the design effect (less valid)

Variable	count	n	Response rate	Prevalence Rate (r)	SE_r	CV_r	Deft	Deff
Indian	1596	896	56.1%	1.6%	0.9%	0.59	2.25	5.06
Children – Urban informal	359	225	62.7%	5.9%	1.9%	0.33	1.23	1.52
Children – tribal	222	140	63.1%	3.9%	2.0%	0.53	1.24	1.55
Youth – tribal	239	148	61.9%	8.6%	3.8%	0.44	1.64	2.69
Children – white	336	145	43.2%	11.3%	3.4%	0.30	1.29	1.66
Youth – white	301	129	42.9%	3.2%	2.2%	0.69	1.41	2.00

Appendix B1: Testing for HIV infection using oral mucosal transudate specimens: How reliable is it in the South African context?

Introduction

Traditionally, testing to determine whether or not an individual is infected with HIV is done on plasma extracted from blood. However, since 1986 other body fluids have been used, usually urine, saliva or oral mucosal transudate (OMT), for detecting antibodies to HIV. The key advantage of using non-blood specimens is that the procedure is non-invasive which eliminates adverse events associated with venepuncture, improves acceptability to clients and decreases costs.

The main concern with regard to using OMT is the validity of the results. Validity is measured by *sensitivity*, the percentage that measures positive with the test among those who have HIV antibodies, and *specificity*, the percentage that measures negative with the test among those who do not have HIV antibodies. Many investigators have studied and evaluated OMT tests and found them to be almost as valid as blood tests. Most studies have taken homologous sets of plasma and OMT or saliva and determined the sensitivity, specificity and positive predictive value of OMT/saliva testing in comparison to plasma EIAs or Western Blot tests.

In 1997 the University of California reviewed all published studies on saliva testing for HIV and selected results are shown in Appendix B2below. The consistently high sensitivity and specificity of the GAC ELISA when used on a variety of specimen types and of the Orasure, except when used with the Abbott EIA, is apparent from the data.

Subsequent to 1997 the US Food and Drug Administration (FDA) has approved a commercial HIV antibody test that is specially designed for use with oral-fluid specimens. The oral fluid Vironostika HIV-1 Microelisa system (Organon Teknika Corporation, Durham, N.C.) has been licensed for use with the associated OraSure collection device. In two large comparative trials using this system, sensitivities and specifications of 99.9% were reported by Gallo et. al. (1997) and 99.2% by Granade et. al. (1995), respectively. This EIA is identical to the serum-based Vironostika HIV-1 test assay except that the procedure has been modified by decreasing the sample dilution from 1 to 75 for serum to 1 to 2 for oral fluids.

Testing for HIV using saliva or OMT in Africa

Using non-blood specimens to test for HIV has been used extensively in Africa since at least 1990 (Behets et al.. 1991). Luo et al. (1995) evaluated the use of saliva specimens for detection of HIV antibodies using three different commercially available ELISAs. Saliva specimens from 107 patients selected at random from HIV high, medium and low-risk areas of the hospital were screened using the 3 ELISAs. Of the 107 patients, 50 were positive and 57 negative for antibodies to HIV on confirmatory Western blot testing. For detection of antibodies to HIV in saliva, the Wellcozyme HIV1 + 2 GACELISA VK61 had a sensitivity and a specificity of 98%, the Wellcozyme HIV-1 recombinant VK56/57 a sensitivity and specificity of 96%, and the Wellcozyme HIV1 + 2 VK54/55 a sensitivity of

94% and a specificity of 95%. For detection of antibodies to HIV in serum, the Wellcozyme HIV-1 recombinant VK56/57 had a sensitivity and a specificity of 100%, the Wellcozyme HIV1 + 2 GACELISA VK61 a sensitivity and a specificity of 98%, and the Wellcozyme HIV1 + 2 VK54/55 a sensitivity and a specificity of 96%. The authors concluded that the study illustrated that saliva could be used as an alternative to serum for screening for anti-HIV antibodies in African patients.

Ettiegne-Traore et al. (1998) evaluated saliva testing in a West African field situation where both HIV-1 and HIV-2 are present. A cross-sectional study was conducted among female sex workers and their stable male partners at a STD/HIV clinic in Abidjan, Cote d'Ivoire. The sensitivity and specificity of the saliva test were 99.4% and 99.3% respectively, and the positive and negative predictive values were 99.7% and 98.7% respectively. In this West African field situation the authors stated, "saliva testing has a high validity compared to serum testing." Similar studies have been undertaken in Uganda (Grant et al. 1996), Zambia (Fyllkesnes & Kasmuba 1998) and Djibouti (Tribble et al. 1997). There is no evidence from any of these studies that using saliva or OMT in the operational setting in Africa produces results which are any less reliable that similar studies conducted elsewhere in the world.

Testing for HIV using saliva or OMT in South Africa

Extensive HIV surveillance is conducted in South Africa and saliva and OMT is increasingly being used in preference to blood. The South African Medical Research Council (MRC) has used saliva specimens for research conducted in workplaces (Colvin et al. 2000), prisons (Colvin et al. 2002) and among truck drivers (Ramjee & Gouws 2002). Webber et al. (2000) compared using rapid tests for HIV antibodies in saliva and blood. The Saliva-Strip HIV-1/2 (Saliva diagnostic systems Inc.) correlated with standard blood-based ELISA assays in 151 out of 153 cases. The two false negatives came from two severely malnourished and ill babies. The authors concluded that the anti-HIV test strip methodology for whole blood and saliva specimens was rapid, reliable and easy to perform and interpret.

Conclusion

South African laboratories that have experience in saliva or OMT testing and that have appropriate QC controls in place are capable of producing valid results from field surveys. We therefore conclude that it is appropriate to use OMT testing using the Orasure / Vironostika combination for HIV seroprevalence determination in the present study.

Appendix B2

Table B2: Selected published studies of HIV antibody assays using saliva, 1987-96

Authors	Collection method	HIV antibody assay	Number of Subjects HIV+	HIV-	Sensitivity (%)	Specificity (%)
Parry et al. 1987	Free drip	GACELISA	43	10	100.0	100.0
Holmstrom et al, 1990	Stimulated drip	Vironostika ELISA	36	14	97.2	100.0
Behets et al. 1991	Free drip	Vironostika ELISA	145	313	97.9	100.0
Major et al. 1991	Not stated	Cambridge ELISA	119	429	98.3	100.0
Crofts et al. 1991	Salivette	GACELISA	50	50	98.0	100.0
Coates et al. 1991	Free drip	Cambridge EIA	11	323	100.0	100.0
Klokke et al. 1991	Not stated	GACELISA	42	48	100.0	100.0
Van den Akker et al. 1992	Free drip	Vironostika ELISA	79	115	100.0	100.0
Gershy-Damet et al. 1992	Free drip	GACELISA	32	43	100.0	97.7
Soto-Ramirez et al. 1992	Orasure	Organon Teknika ELISA	356	1,524	99.4	100.0
Thongcharoen et al. 1992	Free drip	GACELISA	54	55	100.0	100.0
Covell et al. 1993	Salivette	GACELISA	4	94	100.0	100.0
Holm-Hansen et al. 1993	Orasure	Abbott EIA	41	244	92.7	100.0
	Orasure	Abbott Testpack	44	243	100.0	100.0
	Orasure	Murex SUDS-1	36	230	97.2	100.0
Frerichs et al. 1994	Omni-Sal	GACELISA	75	1,405	100.0	99.9
Chassany et al. 1994	Omni-Sal	GACELISA	115	451	100.0	100.0
Frerichs et al. 1994	Omni-Sal	GACELISA	300	1,654	100.0	99.6
Luo N et al. 1995.	Free drip	GACELISA	50	57	98.0	100.0
Granade et al. 1995	Omni-Sal	Abott 3A11 EIA	149	136	100.0	99.3
	Omni-Sal	GACELISA	149	136	100.0	99.3
del Rio et al. 1996	Orasure	Abbott Recombinant	137	366	98.5	100.0

APPENDIX C

List of fieldworkers

Pre-notification team (Phase I)

SAHA team

MM Buckton*, P Ditlopo, GB Dyason, AJ Fourie, N Henda, Z Holtman, S Jooste, Z Ka-Ndiki, ES Kgori*, ML Moropeng, J Naidoo, F Nair*, DJ Nkau, A Nqeketo, G Petros, S Ramlagan, SP Seoka, TJ Stunden, Y Toefy, CS Valley*

*Geospace survey team***

C Bird, C Ellis, H Khutwane, J Loots, P Louw, P Maake, E Malebo, M Mokoena, L Mokwena, G Muthimuni

Fieldwork supervisors (Phase II)

Eastern Cape

C Booi, TT Lokwe, A Mapukata, FW Ngqovu, L Stuurman, N Tyalimpi

Free State

M Scholing, N Tsubane

Gauteng

H Da Gama, MM Kau, E Nel, J Sandamela

KwaZulu-Natal

D Irwin, P Khumalo, L Ndaba, S Pillay, L Xaba

Limpopo

N Molepo, L Papo, S Ramahuta

Mpumalanga

L Mavuso, N Mndawe, MP Moloi

Northern Cape

E Botha, A Molale, EJM Steenkamp

North West

J Mojapelo, DJ Nkau,T Papo

Western Cape

T Ambler-Smith, M Arrison, DC Esterhuyse, G Jansen, K Moodley,

Fieldworkers (Phase II)

Eastern Cape

CGT Adams, TSA Africa, TE Bakubaku, N Ben Maswi, T Bokwe, CM Campher, M Carolus, PN Daniso, PA Finca, E Gexa, K Gobinca, A Gwayi, N Kamati, N Kawa, N Madikane, Mafukuzela, N Makwabe, M Mbebe, VPM Mckonie, N Mfunda, NA Mhlantla, N Mkanzi, LN Mkondweni, G Mpetile, X Phillip, OC Prince, IF Qwele, NW Tshongweni

Free State

A Baloyi, E Kula, C Majoro, N Mohololo, T Nqolo, A Roux, E Sechoaro

Gauteng

G Booysen, K Kgwadi, KJ Luvuno, C Madumo, PT Mafatshe, RK, Makwanyane, T Mashaba, MM Mashele, G Matshoge, QA Mnguni, J Mogola, N Mohapeloa, N Mokhantso, MC Molapo-Matsoso, C Motsepe, L Motumi, N Mpinga, T Msimang, D Nkosi, M Ramashiya, G Rathebe, S Sekhaolelo, EN Silosana

* Phase I Revisiting fieldworkers

** Many of the surveyors also assisted in the pre-notification process

KwaZulu-Natal
S Blummenfeld, D Debroize, M Dlungwani, MANO Govender, C Khumalo, L Khumalo, F Magubane, B Makatini, B Mapumalo, JJ Mazibuki, T Mbatha, NG Mchunu, N Mkize, D Moholo, M Moleko, H Mtambo, SJ Ngcobo, B Ngidi, C Ngwne, NZ Nyanisa, TJ Nzimande, I Ogle, M Rehman, E Shezi, E Xulu, B Zulu, T Zwane

Limpopo
L.N.I. Baloyi, M Kgosieng, T Kutumela, D Mahlaela, B Mahungati, P Mamabolo, Mavangwa/Mabunda, T.M Miyen, N Modiba, N Nyakane, T Ramoshaba

Mpumalanga
F Dlungwana, G Kunene, F Mashego, N Matsabe, M Mavimbela, T Mbuli, T Mdlalose, E Mlambo, TN Modise, N Sebolele

Northern Cape
WC Havenga, M Isak, EA Johnson, ME Khabele, J Nkoane, T Phala, K Russel, EJM Steenkamp

North West
M Bhunu, SM Ditsi, M Erasmus, E Kau, H Mafa, MS Mokhele, T Mothibi, M Nteo, N Sebokolodi, JJ Swanepoel

Western Cape
M Bruinette, A Ebrahim, H Gcuwa, S James, N Marenene, N Mphalwa, IT Ndzotyana, O Prince, E Pringle, VN Rengqe, R Rhode, J Schoonraad, D Seth, J Thompson

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