South African National HIV Prevalence, Incidence, Behaviour and Communication Survey, 2008

The Health Of Our Children

With financial support from:

HSRC Human Sciences Research Council

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FOREWORD

HIV/AIDS continues to cause untold suffering in our country as it does in many countries in the southern Africa region. However, the past few years have seen some notable progress in the fight against HIV/AIDS in our country, particularly among our children. This has been mainly attributed to the successful implementation of the prevention of mother-to-child transmission (PMTCT) programme among young children and their mothers and behaviour change involving increased condom use among youth. While this achievement is commendable, it is also important to take stock of how well we are doing as a country in terms of other infant and child health issues as well as with maternal health. We should not ignore other childhood diseases and only focus on HIV/AIDS as doing so would be at our own peril. Consequently, this report combines the issue of HIV/AIDS and other infant and child health issues. This is the first time this type of study has been done on a national level. It will help improve our understanding of the health status of our children in relation to HIV.

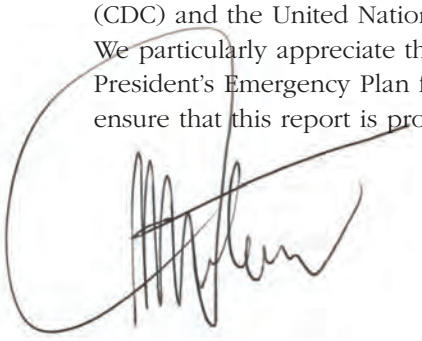
This report, which is the second one based on the third population-based HIV seroprevalence survey conducted in 2008 by the consortium led by the Human Sciences Research Council (HSRC), focuses on health of children 0–18 years of age. Among the critical infant and child health issues addressed are included the place of birth and presence of birth attendants, immunisation against childhood diseases, infant feeding, scarification, perceived health status and health care utilisation. In addition, the report also covers two key maternal health issues, namely, antenatal care (ANC) attendance during pregnancy and HIV testing. Furthermore, apart from HIV prevalence in children 0–18 years of age, the report presents behavioural determinants of HIV infection, access to behavioural change communication as well as contextual factors such as orphanhood and child-headed households, poverty (or household income) and risk factors and risk environments for children at home and at school.

Although the report highlights that much progress has been achieved in preventing and mediating the impact of HIV/AIDS on our children as well as advancing some aspects of both maternal and child health on our country, it also points out areas of great concern such as maternal and neonatal mortality, poor immunisation rates and poor infant feeding practices, which urgently require attention, and where some tangible recommendations about how this can be achieved can be given. As government, we hope that with such information now at our disposal we will be able to revise some of our policies and programmes in order to ensure that the health of our children as well as our mothers is not compromised.

The information contained in this report as well as the first report from the same survey (see Shisana, Rehle, Simbayi et al. 2009) comes at a critical moment as we are currently undertaking the midterm review of our National Strategic Plan for HIV/AIDS and sexually transmitted infection for 2007–2011. More importantly, both reports present indicators for possible inclusion in both the United Nations General Assembly Special session (HIV/AIDS) (UNGASS) Declaration of commitment national report (2001) and the 2015 Millennium Development Goals (MDGs) report to which our government and people have committed themselves.

We would like to thank the HSRC, the Medical Research Council (MRC) of South Africa, and the Centre for AIDS Development, Research and Evaluation (CADRE) who have collaborated together with staff from US Centers for Disease Control and Prevention

(CDC) and the United Nations Children's Fund (UNICEF) to produce this excellent report. We particularly appreciate the financial resources provided by both the United States President's Emergency Plan for AIDS Relief (PEPFAR) through the CDC and UNICEF to ensure that this report is produced.



Dr Aaron Motsoaledi
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To undertake a project of this magnitude requires a collective effort from a team whose members bring a range of expertise and experience at different stages to the project. This project would not have been possible without the support, hard work and dedication of the people listed below.

We would like to acknowledge the contribution of our participants in the study; there would have been no project without the children and their families who agreed to answer questionnaires and give blood specimens for testing. We thank all households who were part of the study and allowed our fieldworkers entry into their homes and their lives. The information gathered is critical in informing planning and will be useful in advocating for the better health for our children.

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ACRONYMS AND ABBREVIATIONS

ABET	Adult basic education and training
AIDS	Acquired immune deficiency syndrome
ANC	Antenatal care
CADRE	Centre for AIDS Development, Research and Evaluation
CDC	United States Centers for Disease Control and Prevention
CSPro	Census and Survey Processing System
DBS	Dried blood spot
DHHS	Department of Health and Human Services (USA)
DHS	Demographic and Health Survey
DOH	Department of Health
EA	Enumeration area (census)
EPI	Expanded Programme on Immunisation
FWA	Federal-wide Assurance (USA)
FBO	Faith-based organisation
GP	General practitioner
GPS	Global positioning system
HIV	Human immunodeficiency virus
HPLC	High performance liquid chromatography
HSRC	Human Sciences Research Council
IMCI	The Integrated Management of Childhood Illnesses
IRB	Institutional Review Board
MDG	Millennium Development Goal
MOS	Measure of size
MRC	Medical Research Council
NACOSA	National AIDS Coordinating Committee of South Africa
NICD	National Institute for Communicable Diseases
NFCS	National Food Consumption Survey
NGO	Non–governmental organisation
NSP	HIV and AIDS and STI National Strategic Plan for South Africa, 2007–2011
NTC	National Technical Certificate
OVC	Orphans and vulnerable children
PCR	Polymerase chain reaction
PEPFAR	United States President's Emergency Plan for AIDS Relief
PHC	Primary health care
PLWHA	People living with HIV/AIDS
PMTCT	Prevention of mother-to-child transmission
PSU	Primary sampling unit
REC	Research Ethics Committee of the HSRC
SACE	South African Council of Educators
SADC	Southern African Development Community
SANAC	South African National AIDS Council
SAS	Statistical analysis software
SSU	Secondary sampling unit
Stats SA	Statistics South Africa
STI	Sexually transmitted infection
TB	Tuberculosis
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNGASS	United Nations General Assembly Special Session (on HIV/AIDS)

UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USU	Ultimate sampling unit
VCT	Voluntary counselling and testing
VP	Visiting point
WHO	World Health Organization

Background

With the advent of democracy in 1994, the post-apartheid government set out to develop a unified health system capable of delivering quality health care to all the citizens efficiently and in a caring environment. South Africa has since made numerous legislative changes and introduced policies to facilitate the realisation of the right of access to health-care services. In 2007, South Africa adopted the National Strategic Plan (NSP) for HIV/AIDS and sexually transmitted infections (STIs) for 2007–2011 (DOH 2007a), which sought to reduce HIV incidence by 50% by 2009 and obtain 80% coverage of HIV/AIDS care, treatment and support for all people living with HIV/AIDS (PLWHA) by 2011. However, despite all these supportive policies, plans and guidelines and the allocation of funds to achieve these, health outcomes among South Africans have remained poor: life expectancy has dropped by almost 20 years from 1994 levels and maternal and child mortality rates are on the increase.

South Africa's infant and under-five mortality rates have increased from 44 to 48 and 56 to 67 deaths per 1 000 live births respectively from 1990 to 2008. Most of these deaths are caused by conditions that are either preventable or treatable such as AIDS (35%), neonatal causes (30%) and pneumonia and diarrhoea (17%). Achieving the Millennium Development Goals (MDGs) will prove difficult unless there is a dramatic decrease in new HIV infections in mothers and children.

Access to antenatal care (ANC) services is almost universal in South Africa where more than 92% of pregnant women attend at least one ANC visit and about three-quarters attend at least four visits before delivery (DHS 2003). Like ANC attendance, 89% of women have their infants delivered by skilled health workers (DHS 2003). However, high maternal mortality rates reflect major problems in the quality of labour and delivery services.

In 2006, an estimated 38 000 South African children acquired HIV from their mothers around the time of birth and an additional 26 000 were infected during the breastfeeding period (DOH 2007b). In 2008, 73% of all pregnant women living with HIV received antiretroviral prophylaxis for the prevention of mother-to-child transmission (PMTCT) and a study conducted in Khayelitsha, Cape Town showed that high PMTCT uptake resulted in an overall HIV transmission rate of less than 8%.

South Africa has made considerable progress in providing antiretroviral therapy to children. In 2008, there were 57 228 children on treatment representing 61% coverage (Stocktaking Report 2009). While numbers of children on antiretroviral therapy have increased over the years, the median age group for the initiation of antiretroviral therapy in children remains above five years, which means younger children who are at the highest risk of death from HIV-related causes are not receiving antiretroviral therapy.

Feeding practices have an impact on nutritional status, growth and the health status of children and consequently their survival. The World Health Organization/United Nations Children's Fund's (WHO/UNICEF 2009) global strategy of infant and young child feeding states that lack of breastfeeding, particularly exclusive breastfeeding in the first six months, is a risk factor for morbidity and mortality among children. In South Africa, breastfeeding is the norm with 88% of South African mothers reported to have initiated breastfeeding. However, only 8% of infants are exclusively breastfed by six months of age. Approximately 70% of children in this age category were reported to have received complementary feeds before the age of six months.

South Africa has the highest number of children living with HIV in the world with an estimated 280 000 children below the age of 15 years living with the infection. The risk of HIV infection among children 15–18 years of age is predominantly through unprotected heterosexual intercourse.

Children are also exposed to risky situations within homes, schools and communities that increase the potential for the risk of HIV transmission. Sexual abuse is known to occur in family and home settings. Schools and communities can also be unsafe, particularly for children who are not supervised when moving between school and home.

In South Africa, there are close to three million orphans, including orphans who have lost parents to AIDS. More than 60% of children live in poverty and AIDS deepens poverty at the household level as it causes families to cut back in areas of consumption that particularly affect children – food and costs associated with schooling and health care.

Rationale and objectives

The main rationale for this study was to better understand the health status of South African children in relation to HIV. Children have not been adequately included in national health surveys such as the Demographic and Health Survey (DHS), and this study allowed for the assessment of progress towards the realisation of the Millennium Development Goals (MDGs) and the attainment of the National Strategic Plan targets in South Africa.

The objectives were:
- to investigate the health status of South African children;
- to investigate the HIV status of infants, children and adolescents;
- to investigate risk factors associated with HIV infection in children;
- to assess the exposure of children and adolescents to HIV communication programmes;
- to assess the male circumcision status in South African children.

Methodology

A cross-sectional population-based household survey was conducted using a multistage stratified sampling approach (see Appendix 1 for a detailed methodology). The study design and methods used in 2008 were similar to methods used in the 2002 (Shisana & Simbayi 2002) and 2005 (Shisana, Rehle, Simbayi et al. 2005) surveys; except in the 2002 survey, oral transudate specimens were used for HIV antibody testing, whilst in both 2005 and 2008, dried blood spot (DBS) specimens were used.

The 2002 and 2005 surveys included individuals aged two years and older living in South Africa. The 2008 survey included people of all ages living in South Africa, including children under two years of age. All people living in the selected households were eligible to participate, including those living in hostels, but people staying in educational institutions, old-age homes, hospitals and uniformed-service barracks, as well as homeless people, were excluded from the survey.

A total of 1 000 census enumeration areas (EAs)[1] from the 2001 population census were selected from a database of 86 000 EAs and mapped in 2007, using aerial photography to

1 An enumeration area (EA) is the spatial area that is used by Statistics South Africa (Stats SA) to collect census information on the South African population. An enumeration area consists of approximately 180 households in urban areas, and 80 to 120 households in a deep rural area. It is considered to be small enough for one person to collect census information for Stats SA. The country has been subdivided into about 86 000 EAs.

create a new updated Master Sample as a basis for sampling visiting points/households. The selection of EAs was stratified by province and locality type. Four mutually exclusive age groups were used for sampling participants – under 2 years of age; 2–14 years of age; 15–24 years of age; and 25 years and older. Only one person in each age group was selected in each household.

Questionnaires used in the 2008 survey were similar to those used in the 2002 and 2005 surveys. A new questionnaire for mothers/guardians of children under two years of age was added. This study received Institutional Review Board (IRB) approval from the HSRC's Research Ethics Committee and Human Subjects Review from the CDC's Global AIDS Programme before the fieldwork commenced.

Findings

Maternal health

Just over 97% of mothers of children under two years of age reported that they had received ANC during their pregnancy. Nearly three-quarters (71.4%) reported that they had received antenatal services five times during pregnancy, while 15.7% said they had made four visits to the health facility. A very high proportion (95.5%) reported having been offered an HIV antibody test.

Infant and child health

The majority of South African children under two years of age (76.7%) were born in hospitals and a few were born at clinics. The practice of delivering at home is not common, with only 5% reporting that this occurred. The overwhelming majority of children under two years of age in South Africa (94.9%) were delivered by a skilled attendant; two-thirds (66.7%) were delivered by a nurse or midwife and 18% by doctors. Traditional birth attendants seem to play a minor role in the delivery of babies in South Africa.

The coverage for measles and BCG[2] was 85.5% in this study, which is comparable to the coverage estimates provided by WHO/UNICEF (2009) of 81.0%. Similarly, DPT1 at 72.8%, DPT3 at 62.6% and Polio3 at 67.2% were also not significantly different from the WHO/UNICEF estimates (DPT1 77.0%, DPT3 67.0%, DPT3 65.0%). Substantially lower coverage was reported from our study for HepB3 at 3% and Hib3 at 2% compared to WHO/UNICEF's estimates of 67.0% for both Hib2 and HepB3. However, the relatively low level of measles immunisation of 64.8% (comparable to WHO/UNICEF's 62.0%) spells danger for not only children, but also for adults over 40 years of age. This is more so since South Africa does not have a policy of booster immunisation against measles during the teen period. The recent outbreak of measles in Gauteng Province of South Africa is a reflection of low immunisation rates against measles. If measles immunisation is taken as an indicator of failure to prevent childhood illnesses, we clearly have a major problem on our hands.

More than half of children (51.3%) from birth to six months of age were mixed fed, a quarter (25.7%) exclusively breastfed, and more than one in five (22.5%) were exclusively formula fed. Fewer than 1% of children were breastfed by another woman.

The overwhelming majority (97.1%) of South African children are HIV negative but for the remainder who are HIV positive (2.9%), mortality during the first five years is high.

2 The full names of all vaccinations are shown in Table 4.3a on page 20.

This might explain the contradictory finding below of a generally healthy population of children, but high morbidity and mortality of children under five years of age.

With regards to levels of hospitalisation in the 12 months prior to the study, it was found that 21.2% of children under two years of age had been hospitalised and stays in hospital averaged 6.8 days, suggesting that this group had high morbidity. The majority of children 2–18 years of age reported health status of either excellent or good for both sexes (93%–94%). On average, 23.8% of children had visited hospitals in the 12 months prior to the study, with an average number of visits of almost twice per year, while 66.9% of the children visited a public outpatient clinic in the same 12 months, with an average number of visits of 3.9 times per year compared to 22.6% of children who visited a private outpatient clinic, with an average number of visits of 3.0 times per year.

There were few reported diagnosed conditions. Allergies were the most widely reported health condition and were mentioned by only 4.4% of the children. Asthma was the condition that was medicated by the largest majority of those with a diagnosed health condition (80.2%). This finding is in line with the perceived good health status reports in this age group.

HIV prevalence

Overall HIV prevalence among children 18 years of age and younger who participated in this survey was 2.9%. The age-specific HIV prevalence levels found were as follows: 3.3% (95% CI: 2.1–5.2) among children 0–4 years of age, 2.5% (95% CI: 1.7–3.7) among those 5–11 years of age, 1.1% (95% CI: 0.5–2.4) among adolescents 12–14 years of age, and 4.5% (95% CI: 2.8–7.2) among teenagers 15–18 years of age. The HIV-prevalence level among children 0–4 years of age mainly reflects vertical transmission (i.e. from mother to child) while that among teenagers 15–18 years of age mainly reflects sexual transmission as a result of unsafe sexual practices.

The prevalence of HIV infection varied by province with the lowest prevalence observed in Western Cape at less than 1%, while low to intermediate HIV prevalence was observed in Northern Cape, Eastern Cape, North West and Limpopo (< 3%). Provinces with higher HIV prevalence were Gauteng (3.1% [95% CI: 1.5–6.0]) and Free State (3.1% [95% CI: 1.3–7.2]), KwaZulu-Natal (3.4% [95% CI: 1.9–6.0]) and Mpumalanga (4.5% [95% CI: 2.5–8.0]).

Cultural practices

Two mainly cultural practices, scarification and male circumcision, were examined. Both practices were uncommon.

The prevalence of scarification among infants under two years of age was 10.9% (95% CI: 8.8–13.4) and there was no difference found between males (11.0% [95% CI: 8.2–14.6]) and females (10.8% [95% CI: 7.9–14.7]).

By using a self-report method from parents and caregivers, it was found that some 4.3% of male infants under two years of age were reported to be circumcised in comparison to 21.7% of adolescents 15–18 years of age. Many of the adolescents who were circumcised did so for traditional reasons (41.5%) rather than for prevention of HIV and other sexually transmitted infections (10.5%). They were mainly circumcised when they were between 10 and 14 years of age (41.1%) and 15–18 years of age (31.3%). The majority of circumcisions for young males are performed in hospitals (52.6%) with most of the remainder being performed as part of initiation (41.9%). Among 886 males 15–18 years of age in the study,

nearly a third (30.3%) were aware that male circumcision has recently been shown to (partly) reduce the risk of HIV infection, while the remainder were unaware of this fact. In addition, among 663 uncircumcised males 15–18 years of age, fewer than half of them (48.1%) said they would consider being circumcised, while among 768 females 15–18 years of age in the study, the majority (57.9%) said they would be supportive of an uncircumcised partner being circumcised.

Sexual behaviour

Among children 12–14 years of age, 10.8% of males and 14.5% of females were sexually active in the year prior to the study. Among the sexually active population for the study, nearly all males 12–18 years of age had had sex within the same age-range, while a significant percentage of females in the same age group (26.4%) had had sex with males who were five years or more older than themselves.

Although only based on 162 males and 220 females who were sexually active in the group 15–18 years of age, more males (29.2%) reported having had more than two sexual partners in the 12 months prior to the study than did females (9.5%).

Media and communication

Television (88%) and radio (78.3%) were the most prominent media sources of AIDS information for those 12–14 years of age, whilst for those 15–18 years of age, television (90.6%) and posters (82.8%) were most prominent.

AIDS communication programmes in South Africa at national level include government's Khomanani Campaign, NGO-led national programmes such as Soul City, Soul Buddyz and loveLife. The large majority of respondents 12–18 years of age were aware of the major national programmes – with the exception of Khomanani in the younger age group, where only half were aware of the programme.

There were wide variations in the reach of the programmes mentioned above by race. Among adolescents 12–14 and 15–18 years of age, awareness was very low among white teenagers. For example, among children 12–14 years of age, only 8.9% mentioned Soul City, 9.5% Khomanani and 15.4% Soul Buddyz. Awareness of loveLife was considerably higher at 42.1%.

Participation in HIV/AIDS activities was low overall with the exception of attending an AIDS play or an educational event, which at 22.5% was four or more times more likely to be mentioned than any of the other categories. A small, but not insignificant proportion of children mentioned engaging with HIV/AIDS in home environments with 6.3% mentioning helping a family who had lost a member as a result of AIDS, and 6.0% mentioning caring for a person who was sick with AIDS.

Only 16% of parents or caregivers discussed HIV transmission with children 5–11 years of age, and only 14.5% discussed how to prevent the disease.

Orphanhood

The overall rate of orphanhood was 16.8%. This translates to an estimate of 3 032 000 orphans in the country, 1 601 000 males and 1 431 000 females. Most of the orphans were paternal (10.5%), followed by maternal (3.9%), while the fewest were double orphans (2.3%). These findings translate to an estimate of 1 899 000 paternal orphans, 713 000 maternal and 419 000 double orphans. When considered by province, Eastern Cape had

the highest proportion of orphans (23.2% [95% CI: 18.9–28.1]), followed by KwaZulu-Natal (19.4% [95% CI: 16.2–23.2]), whilst Northern Cape (10.5% [95% CI: 7.3–14.7]] and Western Cape (11.0% [95% CI: 8.2–14.6]) had the smallest percentage of orphans. Rural informal areas have the highest burden of orphanhood at 20.0% (95% CI: 17.4–22.8) among the children 18 years old and younger.

Household income

The sources of income were varied for the different locality types. While the majority of households (55.5%) in urban formal areas and the largest proportion of rural formal areas (47.4%) relied on formal salaries, the largest proportion of households in urban informal areas (39.3%) and more than a third (35.5%) of rural informal households had no income. However, a large proportion of those in rural informal areas relied on government pensions or grants (38.0%).

HIV vulnerability in community contexts

With respect to their safety at school, children 12–14 years of age mostly reported that educators always attend classes (77.1%) and also made sure no unauthorised person could enter the school (71.7%). However, they also reported that the educators did not watch the children at break times (only 45.2% indicated that they did so 'always'), watch children leaving school (only 39.7% indicated that they did so 'always'), or monitor the toilets (only 34.2% indicated that they did so 'always').

A third of the children (33.6%) reported that males always/often/sometimes sexually harass females by touching, threatening, or making rude remarks. It was also found that one-twelfth of the children (8.1%) indicated that male educators proposed relationships with female pupils (at school).

Recommendations

Child health

The vast majority of children (close to 90%) visited a public or private out-patient clinic the last time they were sick, indicating a high rate of utilisation of health-care services in South Africa. However, more than 20% of children were hospitalised for an average duration of 6.9 days. This demonstrates both the failure of the primary health-care (PHC) system to prevent and adequately manage diseases and the low quality of care provided in these facilities.

It is recommended that the Department of Health (DOH) prioritise the strengthening of the primary health-care system as the national health response, particularly expanding the number and scope of work of community health workers to include high impact but low cost child health and nutrition interventions.

Policy-makers and managers in the public and private health sectors should also routinely offer HIV testing for sick children and develop the HIV capacity of primary health-care providers for early HIV identification and timely referral and management of advanced HIV infection in children

Maternal health

The study found almost universal access to ANC and skilled attendant deliveries by doctors, nurses and midwives. Of interest is the fact that at least three-quarters of all babies were born in hospitals. However, the increasing maternal and neonatal mortality

reported in UNICEF's 'Saving mothers and saving babies' reports (National Committee for Confidential Enquiries in Maternal Deaths [in press]; DOH 2007c, 2009a) suggests that this is an indication of the poor quality of services in hospitals, particularly in the health maternities and neonatal care units, as further reported in a 2008 unpublished report of the Council for Health Service Accreditation of Southern Africa: Quality improvement and accreditation.

It is recommended that the DOH put a greater emphasis on improving the quality of care, particularly in maternity and neonatal care units. An accreditation system should urgently be institutionalised to monitor the quality of care in our health facilities regularly and serve as a mechanism to hold health managers accountable for the health outcomes of mothers and children.

Infant and child nutrition

Despite the fact that breastfeeding is still considered to be the norm in South Africa, the study found that only 25% of infants were exclusively breastfed during their first six months; the vast majority (75%) were either formula fed or mixed fed.

It is recommended that the current policy and approach to the promotion and support of exclusive breastfeeding be revised to put a stronger focus on community and home-based support for mothers through community-based organisations, community leaders and community workers.

The formula feeding policy should be revised in line with the new World Health Organization (WHO) recommendations that include antiretroviral treatment for HIV-infected mothers at advanced stage of disease and extended infant antiretroviral prophylaxis in breastfeeding mothers to reduce the risk of mother-to-child transmission through breastfeeding.

HIV prevalence in children

Overall, the HIV prevalence among children 18 years old and younger who participated in this survey was 2.9%. The HIV prevalence among the various age strata were as follows: 3.3% for children 0–4 years old, 2.5% for those 5–11 years old, 1.1% for adolescents 12–14 years of age, and 4.5% for teenagers 15–18 years of age. When compared to previous surveys, there was a decline in overall HIV prevalence among children 2–18 years of age from 5.4% (95% CI: 4.1–7.1) in 2002 to 3.5% (95% CI: 2.7–4.6) in 2005 and 3.0% (95% CI: 2.3–3.8) in the present study. This might indicate the possible positive impact of the national PMTCT programme in the two years prior to the study where coverage had significantly increased to reach almost three-quarters of HIV-infected mothers with antiretroviral prophylaxis in a stabilising of the HIV epidemic. Nevertheless, even at this level of prevalence, the number of children living with HIV remains high.

It is recommended that the DOH's accelerated efforts to implement PMTCT should put emphasis on ensuring the access pregnant women with advanced HIV/AIDS have to antiretroviral treatment is improved to further reduce new infections and move towards eliminating paediatric HIV/AIDS.

The DOH should revise the national guidelines to include the early introduction of antiretroviral treatment for infants as soon as infection is confirmed and to establish adolescent-friendly services in treatment centres to respond to the specific needs of the growing numbers of HIV-infected adolescents.

The DOH should also establish an expanded programme on immunisation (EPI)-based surveillance system to track HIV infections in children and continually inform policies and comprehensive HIV prevention, care and treatment services in children.

Cultural practices

The study found scarification among one tenth of infants under two years of age. A fifth of males 15–18 years of age had been circumcised. This suggests that the two mainly cultural practices, scarification and male circumcision, are not very common at such early ages.

With only 30% of males 15–18 years of age knowing about male circumcision as a HIV prevention strategy, it is recommended that a rigorous campaign to promote male circumcision particularly before males reach puberty and are sexually active, as a HIV prevention strategy be undertaken by both the DOH and South African National AIDS Council (SANAC). As for both scarification and traditional male circumcision, there is a need to ensure that traditional practitioners who perform the two procedures are cognisant of the risk this poses for HIV transmission if the procedures are done without proper infection control. Therefore, there is an urgent need for both the Council for Traditional Healers and the House of Traditional Leaders to work side-by-side with both the DOH and SANAC to ensure that this message is received loudly and clearly by all traditional practitioners. The appropriate training must also be provided to ensure they perform the operations using proper infection control measures.

Sexual behaviour

The study found high levels of sexual activity among children 15–18 years of age with a sizable minority of them also having multiple partners. Alarmingly, 10% of adolescents 12–14 years of age also reported that they were sexually active.

It is recommended that HIV health education activities both in schools and out of schools continue to promote sexual abstinence among children 12–18 years of age as a major prevention approach. In particular, there is a need to highlight the dangers posed by early sexual debut to a child's sexual health as well as the risk of HIV infection, particularly when someone is engaged in multiple concurrent sexual partnerships. This should be supplemented by community mobilisation to seek to change the normative acceptance of such practices at community level. There should also be interventions to assist parents to educate their children about sex and HIV as there is evidence that interventions that aim to help parents talk to their children about sex are effective (Ward & Snow 2010).

Media and communication

Children have very high levels of access to broadcast and print media and this access is related to obtaining useful information about AIDS. There is good overall awareness of the main national HIV/AIDS communication programmes, but there is lower awareness of all programmes in rural areas, and the government's Khomanani campaign lags behind the other programmes. Home language speakers of English, Afrikaans, Xitsonga and Tshivenda are marginalised in comparison to Nguni and Sesotho language groups. There is markedly lower awareness of programmes amongst white children. Parents, friends and health facilities are the most prominent sources of AIDS information, and there is very low awareness of the national toll-free AIDS helpline. While parents discuss sexual abuse with children, they are less likely to discuss HIV transmission or prevention.

Although this study did not examine the content of information, it remains important that communication campaigns conduct research among children to establish gaps and needs in relation to HIV/AIDS communication, and that communication content takes into account the changing nature of the epidemic over time.

It is recommended that the government's Khomanani campaign include a strategy that is aimed specifically at reaching children and communicating age-relevant information about HIV/AIDS via mass media channels. Content should be determined through needs analysis and should take into account the need to complement information delivered through schools. This should include an emphasis on child sexual abuse and the rights of children.

All national programmes should coordinate their efforts to reach rural communities to a greater extent, and also address the marginalisation of language and race groups identified in the study.

The national toll-free AIDS helpline is a well-established resource that is under-promoted and all programmes should actively seek to obtain high awareness of the telephone number and encourage its use.

Orphanhood and child-headed households

The study found that the levels of orphanhood among children 2 to 18 years of age appeared to have increased from 14.4% in 2005 to 19.3% in 2008, while, as expected, the proportion of child-headed households appears to have been reduced significantly (from 2.6% in 2005 to 1% in 2008) due to parents living longer after receiving antiretroviral treatments.

It is recommended that programmes for orphans and vulnerable children (OVC) be further strengthened so that both the infected and affected children are supported adequately and also protected from all forms of abuse. As alluded to above, the strengthening of both antiretroviral treatment and PMTCT programmes also ensures that fewer young parents die and leave their children orphaned and in a position where they have to head households.

Household income

The study found that large proportions of households in both urban informal areas (39.3%) and rural informal areas (35.5%) had no income at all, while a similar proportion in rural informal areas (38.0%) relied on government pensions or grants.

It is recommended that the Department of Social Development engage urgently with people living in households with no sustainable livelihoods as this could be a major HIV risk factor for promoting risky behaviour such as transactional sex involving children. There is an urgent need to ensure that social grants are extended to these households as soon as possible.

Risk factors and risk environments for children

This study identified a few potential risk factors for HIV infection among some of the children both at home and school. The fact that some male educators had proposed relationships with girls (at school) is of major concern.

It is recommended that it be emphasised that the protection of children requires all stakeholders (children, parents/caregivers and educators) to act in concert in identifying and minimising some of these risks. The Department of Education and South African

Council of Educators (SACE) should ensure that abuse of pupils by some educators should not be tolerated at all by disciplining those responsible timeously. The initiative by the SACE to establish a website that publishes the names of educators found guilty of sexual misconduct with pupils is a positive development that must be commended, and the employer should ensure that the register is used to remove offenders from the employment roll and also to prevent offenders from joining the profession again, whether in public or private schools. This will protect children from repeat sexual offenders who until recently could change schools and continue to sexually abuse children in another school.

CHAPTER 1

Introduction

1.1 Background

HIV remains one of the major challenges in South Africa. It is only recently – in the context of two decades of the epidemic in this country – that there are signs that HIV prevalence levels in pregnant women are stabilising (DOH 2009). This trend has also been seen in the significant drop in the incidence of HIV among young women, 15–19 years of age, a doubling of people who have been tested for HIV and know their status, and a significant increase in reported condom use (Shisana, Rehle, Simbayi et al. 2009).

Globally, the Joint United Nations Programme on HIV/Aids (UNAIDS) estimated that two million children below 14 years of age were living with HIV in 2007, 90% of them in sub-Saharan Africa. During the same year some 17% (370 000) new infections occurred in children and 270 000 children died as a result of AIDS (UNAIDS 2008). Many children continue to die needlessly despite the global commitments and worldwide availability of affordable and proven technologies to prevent and mitigate the impact of the deadly virus.

1.2 Millennium Development Goals (MDGs) and UNGASS

In 2000, 189 member states of the United Nations joined in the Millennium Declaration, a commitment to ending poverty, suffering and disease by 2015. The declaration included eight main goals to eradicate extreme poverty and hunger; achieve universal primary education; promote gender equality and empower women; reduce child mortality; improve maternal health; combat HIV/AIDS, malaria and other diseases; ensure environmental sustainability and develop a global partnership for development. Significant progress is being made globally: the mortality rate of children under five has declined by 28% from 90 to 65 deaths per 1 000 live births between 1990 and 2008. However, the least progress has been recorded in sub-Saharan Africa where the mortality rate has only declined by 22% compared with a decline of over 40% in Asia, Latin America and Eastern Europe. South Africa is one of the 12 countries where progress has been either stagnant or reversed, mainly because of the HIV epidemic (Chopra, Daviaud, Pattinson et al. 2009).

In the context of HIV, the United Nations General Assembly Special Session (on HIV/AIDS) (UNGASS), which convened in 2001, agreed on a number of targets to achieve universal access to comprehensive HIV prevention, treatment, and care and support services by 2010. The UNGASS Declaration of Commitment included the specific targets of reducing by 50% the number of babies infected by HIV by ensuring that 80% of pregnant women in antenatal care (ANC) receive HIV information, counselling and other prevention services and pregnant HIV-positive women receive treatment to reduce mother-to-child transmission (UNAIDS 2002). South Africa is one of the countries that have made good progress in achieving the UNGASS targets on HIV prevention, care and treatment.

1.3 National policy response

With the advent of democracy in 1994, the post-apartheid government set out to develop a unified health system capable of delivering quality health care to all the citizens efficiently and in a caring environment. It included the aim of ensuring that 95% of the population are within a radius of 5 km of a health facility (DOH 1997). Policies that have

changed the health landscape in South Africa include the Health Policy (1996) that led to the restructuring of the National Health System and promoted universal access to primary health care for all.

South Africa has since made numerous legislative changes and introduced policies to facilitate the realisation of the right of access to health-care services (Presidency 2009). These include the National Health Act (No. 61 of 2003), which provides a framework for a structured uniform health system and is line with the responsibilities that are set out in the Constitution of the Republic of South Africa; the Health Sector Strategic Plan 2007/08–2009/10, which is based on and includes legislation that governs and guides the health sector response (Presidency 2009; DOH 2007a) and the policy of free health-care services for pregnant women and children under six years of age, which was introduced in 1995.

Within the framework of primary health care, the Maternal, Child and Women's Health Policy of South Africa in 1995[3] was developed to promote optimal health and nutrition care of mothers and children (DOH 2007b). Other policies in support of child and maternal health include the Infant and Young Child Feeding Policy 2008, Policy on Quality in Health Care for South Africa (DOH 2008a), School Health Policy for South Africa (2006/2007 South Africa Yearbook: 13 – Health[4]) and Policy Guidelines for Youth and Adolescent Health (DOH 2001; also see Presidency 2009).

South Africa's response to the HIV epidemic began with the launch of the National AIDS Coordinating Committee of South Africa (NACOSA) in the early 1990s and was later strengthened with the establishment of the South African National AIDS Council (SANAC) in 1998. An important milestone was the implementation of the national operational plan for comprehensive HIV care, management and treatment approved by Cabinet in 2003 – a policy that has resulted in more people, including children, accessing antiretroviral therapy. In 2007, South Africa adopted the National Strategic Plan (NSP) for HIV/AIDS and sexually transmitted infections for 2007–2011 that sought to reduce HIV incidence by 50% by 2009 and obtain 80% coverage of HIV/AIDS care, treatment and support for all people living with HIV/AIDS by 2011 (DOH 2007d).

However, despite all these supportive policies, plans and guidelines and the allocation of funds to achieve these, health outcomes among South Africans have remained poor: life expectancy has dropped by almost 20 years from 1994 levels, and maternal and child mortality rates are on the increase.

1.4 Child and maternal health

1.4.1 Infant and under-five mortality and morbidity

Child mortality is used globally as an indicator of a nation's health and level of development. Child mortality is caused by poor access to basic health services and is a good indicator of inequalities in these services (Hakobyan & Yepiskoposyan [in press]), while neonatal mortality is indicative of poor access to quality services (Hessol & Fuentes-Afflick 2005). Globally, the number of deaths among children under the age of five has declined from 13 million in 1990 to 8.8 million in 2008, representing a 32% decline from

3 http://www.doh.gov.za/docs/policy/mcwh-draft.pdf
4 http://www.southafrica-newyork.net/consulate/about%20south%20africa/2007%20Yearbook/health.pdf

the 1990 level. However, progress has remained limited in most of the countries in sub-Saharan Africa (UNICEF 2008).[5]

South Africa was ranked 60th for under-five mortality among 189 countries globally. Between 1990 and 2007 under-five mortality rates decreased only slightly, from 64 to 59, and infant mortality rates from 49 to 46 per 1 000 live births (UNICEF 2009).[6] Most of these deaths are caused by conditions that are either preventable or treatable such as AIDS (35%), neonatal causes (30%) and pneumonia and diarrhoea (17%). In addition, 60% of all deaths of children under five years of age were associated with malnutrition and three out of four severely malnourished children had signs of advanced HIV infection (South Africa Every Death Counts Writing Group 2008). Achieving the Millennium Development Goals will prove difficult unless there is a dramatic decrease in new HIV infections in mothers and children.

1.4.2 Maternal mortality and morbidity

Countries have committed themselves to reducing the 1990 rates for maternal mortality by three-quarters by 2015, but current reports indicate very little progress. In South Africa, maternal mortality had increased fourfold from 104 to 400 per 100 000 live births between 2002 and 2005. Each year an estimated 2 500 mothers die and a recent report on confidential inquiries into maternal deaths shows that 43% of these deaths are attributable to HIV. A large proportion of maternal deaths occur at primary health-care level and this may reflect the quality of services delivered at that level. Other major causes of maternal deaths are hypertension (15.7%), obstetric haemorrhage (12.4%), pregnancy-related sepsis (9.0%) and pre-existing maternal diseases (6.0%) (National Committee for Confidential Enquiries in Maternal Deaths [in press]; DOH 2007c, 2009a).

1.4.3 Interventions to reduce child and maternal mortality and morbidity

Antenatal care

Access to antenatal care (ANC) services is almost universal in South Africa where more than 92% of pregnant women attend at least one ANC visit and about three-quarters have at least four visits before delivery (DHS 2003). Although maternal and child health packages are relatively good in South Africa only 11% of women receive the full package (South Africa Every Death Counts Writing Group 2008). The basic ANC package is an integrated package that includes birth preparedness, rhesus testing, sexually transmitted infection identification and management, including syphilis, voluntary counselling and testing, prevention of mother-to-child transmission (PMTCT), tetanus and toxoid vaccination (South Africa Every Death Counts Writing Group 2008). Issues of distance, transport costs and cultural factors influence pregnant women's decision to make use of ANC.

Skilled attendance at deliveries

As with ANC attendance, 89% of women choose to have their infants delivered by skilled health workers (DHS 2003). However, high maternal mortality rates reflect major problems in the quality of labour and delivery services. These problems include a shortage of human resources, essential equipment and medical supplies. About 11% of women still deliver their babies outside health facilities and without skilled attendants.

5 Unicef (2008). *The state of the world's children*. New York: Unicef.
6 Unicef (2009). South Africa: Women and children in South Africa. Source: http://www.unicef.org/southafrica/children.html

Prevention of mother-to-child transmission of HIV and paediatric HIV care

In 2006, an estimated 38 000 South African children acquired HIV from their mothers around the time of birth and an additional 26 000 were infected while they were being breastfed (DOH 2007d).

In South Africa, the PMTCT programme was established in 2001 and has since been rolled out to all hospitals and to over 90% of primary health-care facilities. Data from 2001 to 2007 show that the proportion of pregnant women receiving HIV testing and counselling increased from 7% in 2001 to over 70% in 2007 (Children's Institute 2009). In 2008, 73% of all pregnant women living with HIV received antiretroviral prophylaxis for preventing mother-to-child transmission and a study conducted in Khayelitsha, Cape Town showed that high PMTCT uptake resulted in an overall HIV transmission rate of less than 8% (WHO 2009b; Coetzee, Hilderbrand, Boulle et al. 2005).

South Africa has made considerable progress in providing antiretroviral therapy to children. In 2008, there were 57 228 children on treatment representing 61% coverage (UNICEF, UNAIDS, WHO & UNFPA 2009). While the number of children on antiretroviral therapy has increased over the years, the median age group for the initiation of antiretroviral therapy in children remains above five years of age, which means younger children, who are at the highest risk of death from HIV-related causes, are not receiving antiretroviral therapy.

There are still challenges with regards to systematically addressing paediatric HIV treatment. A large proportion of children exposed to HIV are not tested for HIV by two months of age. Prophylactic co-trimoxazole for exposed and infected children is still not widely available, and infant feeding practices in the context of HIV are not adhered to.

Immunisation

Child vaccinations are among the public health initiatives that have shown global impact in reducing child morbidity and mortality (Ghendon, Kaira & Elshina 2006; Whitney & Pickering 2002). The World Health Organization (WHO) estimated that 2.9 million deaths amongst children could have been prevented globally had there been high vaccination rates among children (WHO/Inter-agency task team on prevention of HIV infection in pregnant women, mothers and their children 2007). In spite of the enormous benefits of child vaccination, coverage in some developing countries, including South Africa, is still low (Ndirangu, Bärnighausen, Tanser et al. 2009).

Infant and young child nutrition

Feeding practices have an impact on the nutritional status, growth and health status of children and consequently on their survival. The WHO/UNICEF global strategy of infant and young child feeding states that lack of breastfeeding, particularly exclusive breastfeeding in the first six months, is a risk factor for the morbidity of and mortality among children.[7] In South Africa, breastfeeding is the norm with 88% of mothers reported to have attempted to initiate breastfeeding. However, only 8% of infants are exclusively breastfed by six months of age. Approximately 70% of children in this age category were reported to have received complementary feeds before six months of age (DHS 2003).

Malnutrition is associated with 60% of all deaths of children 1–4 years of age and the nutritional status for most children in South Africa has not shown improvement in the last

7 http://www.paho.org/english/ad/fch/ca/gSiYCF_infantfeeding_eng.pdf

14 years: 18.0%, 9.3% and 4.5% of children 1–9 years of age were respectively stunted, underweight and wasted (South Africa Every Death Counts Writing Group 2008; NFCS-FB-1 2005).

Integrated management of childhood illnesses

WHO/UNICEF developed the Integrated Management of Childhood Illnesses (IMCI) in 1995 as a strategy to reduce death, illness and disability, and promote improved growth and development for children under five years of age. In South Africa, this strategy has been implemented since 1998. The programme incorporates the early management of common childhood illnesses such as diarrhoea, malnutrition and pneumonia and it also includes both preventive and curative elements that are implemented by families and communities as well as by health facilities.[8] IMCI has been rolled out to over 40% of all health facilities in the country, and the package of interventions has been expanded to include HIV (DOH 2008a).

Utilisation of health services

Despite reforms in the health sector policies and programmes in South Africa, access to health-care services varies from one area to another and across different socio-economic levels. Lack or delay in accessing health-care services is influenced by poverty, distance and the availability of health-care workers (Health Systems Trust 2008). However, after the implementation of free health care to pregnant women and children under six years of age, 79.8% of the South African population was reported to have access to health-care services in 2007, which shows a decrease compared to the 81.5% reported in 2002 (Stats SA 2008).

1.5 Burden and determinants of HIV among children

1.5.1 HIV prevalence

South Africa has the highest number of children living with HIV in the world with an estimated 280 000 children younger than 15 years of age living with the infection (UNAIDS 2008). Shisana, Mehtar, Mosala et al. (2005) estimated an HIV prevalence of 3.3% for children 2–14 years of age from a population-based survey, while HIV prevalence among those 15–19 years of age was estimated at 6.3%, with females having three times higher rates (9.4%) than males (3.2%) (also see Gouws, Stanecki, Lyerla & Ghys 2008). Most children living with HIV who are under 15 years of age acquire HIV through mother-to-child transmission. Where a mother is HIV positive, there is a 20%–45% chance of HIV transmission. This risk can be reduced to around 2%–4% through the successful implementation of recommended PMTCT measures (WHO 2004; also see WHO/Inter-agency task team on prevention of HIV infection in pregnant women, mothers and their children 2007).

The risk of HIV infection among children 15–18 years of age is predominantly through unprotected heterosexual intercourse (UNAIDS 2008). Sex with multiple and concurrent partners in the context of low prevalence of male circumcision, as well as inconsistent male condom use, have been identified as key drivers of HIV in southern Africa, including South Africa (SADC 2006). Male attitudes and behaviours, intergenerational sex, gender and sexual violence were also identified as major contributing drivers, while high population mobility, inequalities in wealth, cultural factors and gender inequality were identified as social and structural drivers underpinning the epidemic (also see SADC 2006). Early sexual debut is another major risk factor for HIV, particularly among adolescents

8 http://www.who.int/child_adolescent_health/topics/prevention_care/child/imci/en/index.html

under 18 years of age. In 2005 in South Africa, 11.9% males and 5.1% females reported sexual debut by 15 years of age (Shisana, Rehle, Simbayi et al. 2005).

1.5.2 Risk factors and risk environments for children

Children are exposed to risky situations, within homes, schools and communities, that increase the potential for the risk of HIV transmission (Shisana, Mehtar, Mosala et al. 2005). Sexual abuse is known to occur in family and home settings. Schools and communities can also be unsafe, particularly for children who are not supervised when moving between school and home. According to the Crime Information Analysis Centre (2006), teenagers who were pregnant often reported that they had conceived under duress. Rape and child sexual abuse directly increase children's risk of contracting HIV, and this is exacerbated by biological factors, including an underdeveloped genital tract in females, and the risk factors associated with the anal penetration of both males and females.

1.5.3 Orphans and child-headed households

In 2007, about 12.1 million children in southern Africa were estimated to have lost one or both parents to AIDS (UNAIDS, UNICEF & WHO 2008). In South Africa, there are close to three million orphans, including orphans who have lost parents to AIDS. More than 60% of children live in poverty and AIDS deepens poverty at the household level as it causes families to cut back in areas of consumption that particularly affect children – food and costs associated with schooling and health care (Collins & Leibrandt 2007).

There are growing numbers of child-headed households: 2.6% of children 12–18 years of age identified themselves as heads of the households in 2005 compared to 1.5% in 2002 (Brookes, Shisana & Richter 2004) and overall 0.6% of all households are headed by children younger than 18 years of age (Stats SA 2007).

1.5.4 School attendance

Access to education plays an important role in a child's overall development. The overwhelming majority (96.5%) of South African children 7–17 years of age attended school in 2007 (Pendlebury, Lake, Smith et al. 2009). Access to schooling is seen to be a cost-effective measure for combating HIV infection and diseases of poverty, and school attendance has been shown to be associated with lower-risk sexual behaviours among young men (UNICEF 2008; Hargreaves, Morison, Kim et al. 2008).

1.6 Rationale for study

The main rationale for this study is to understand better the health status of South African children in relation to HIV. Children have not been adequately included in national health surveys such as the Demographic and Health Survey, and this study makes it possible to assess progress towards the realisation of the Millennium Development Goals and the attainment of the National Strategic Plan targets in South Africa.

1.7 Objectives

The specific objectives of the analysis were:

- to investigate the health status of South African children;
- to investigate the HIV status of infants, children and adolescents;
- to investigate risk factors associated with HIV infection in children;
- to assess the exposure of children and adolescents to HIV communication programmes;
- to assess the male circumcision status in South African children.

CHAPTER 2

Methodology

2.1 Study design

A cross-sectional population-based household survey was conducted using a multistage stratified sampling approach. The study design and methods utilised in 2008 were similar to methods used in the 2002 (Shisana & Simbayi 2002) and 2005 (Shisana, Rehle, Simbayi et al. 2005) surveys; except in the 2002 survey, oral transudate specimens were used for HIV-antibody testing, whilst in both 2005 and 2008 dried blood spot (DBS) specimens were used.

2.2 Study population

The 2002 and 2005 surveys included individuals aged two years and older living in South Africa. The 2008 survey included persons of all ages living in South Africa, including children under two years of age. All persons living in the selected households were eligible to participate, including those living in hostels, but persons staying in educational institutions, old-age homes, hospitals and uniformed-service barracks, as well as homeless people, were excluded from the survey.

2.3 Sampling

The sampling methodology used was similar to the previous two surveys (Shisana & Simbayi 2002; Shisana, Rehle, Simbayi et al. 2005). A total of 1 000 census enumeration areas[9] (EAs) from the 2001 population census were selected from a database of 86 000 EAs

Figure 2.1: HSRC Master Sample 2007

9 An enumeration area (EA) is the spatial area that is used by Statistics South Africa (Stats SA) to collect census information on the South African population. An enumeration area consists of approximately 180 households in urban areas, and 80 to 120 households in a deep rural area. It is considered to be small enough for one person to collect census information for Stats SA. The country has been subdivided into about 86 000 EAs.

and mapped in 2007 using aerial photography to create a new updated Master Sample (see Figure 2.1) as a basis for sampling visiting points (VPs)/households.

The selection of EAs was stratified by province and locality type. Locality types were identified as urban formal, urban informal, rural formal (including commercial farms) and rural informal. In the formal urban areas, race was also used as a third stratification variable (based on the predominant race group in the selected EA at the time of the 2001 census).

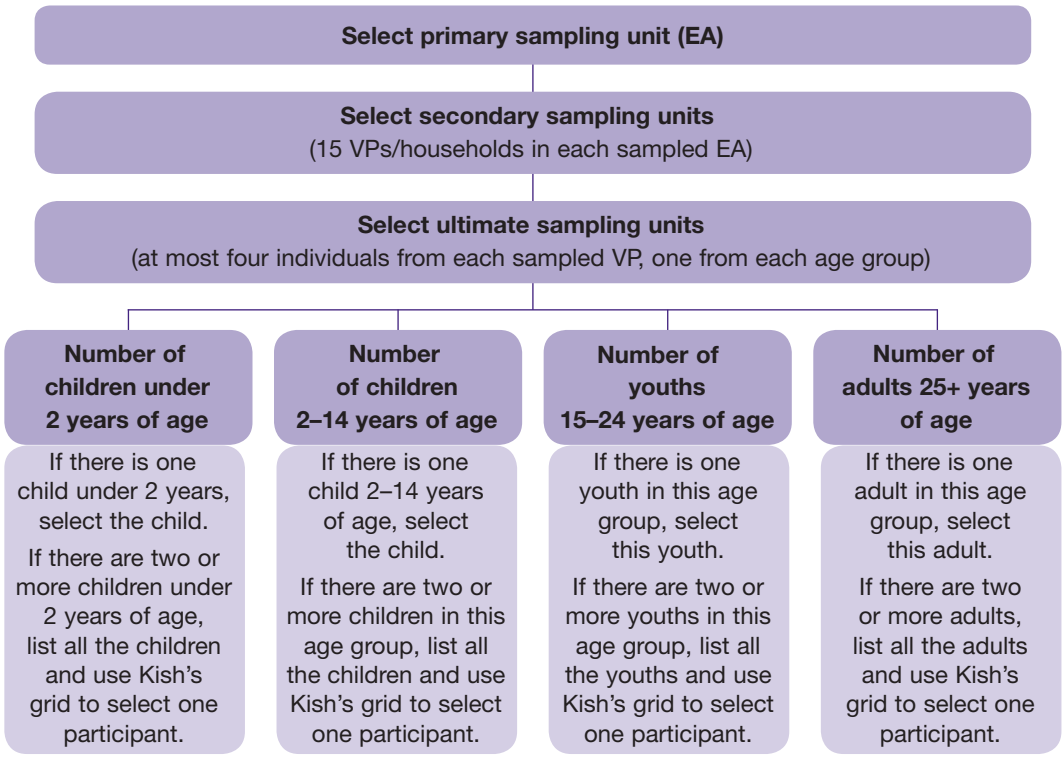
The 1 000 selected EAs formed the primary sampling units (PSUs). Visiting points or households were used as secondary sampling units (SSUs). Within each household, eligible individuals selected for the survey represented the ultimate sampling unit (USU). EAs were sampled with probability proportional to the size of the EA using the 2001 census estimate of the number of VPs in the EA database as a measure of size (MOS). A random sample of 15 VPs was selected from each one of the 1 000 EAs. This yielded a total sample size of 15 000 households or VPs.

Four mutually exclusive age groups were used for sampling participants as follows (see Figure 2.2):

- under 2 years;
- 2–14 years;
- 15–24 years;
- 25 years and older.

Only one person in each age group was selected in each household. A household member was defined as any person who slept in the household on the night preceding the survey (including visitors).

Figure 2.2: Steps in drawing the sample



2.4 Sample size estimation

The sample size estimation was guided by two requirements:

- the requirement for measuring change over time in order to detect a change in HIV prevalence of five percentage points in each of the main reporting domains, namely gender, age group, race, locality type and province (5% level of significance, 80% power, two-sided test);
- the requirement of an acceptable precision of estimates per reporting domain; i.e. to be able to estimate HIV prevalence in each of the main reporting domains with a precision level of less than ± 4 %, which is equivalent to the expected width of the 95% confidence interval (z-score at the 95% level for two-sided test). A design effect of 2 was assumed.

The total sample size of 15 000 households was based on the sample sizes needed for each reporting domain, and also took into account the multistage cluster sampling design and the expected response rates. There is no previous information on HIV-testing coverage for infants under two years of age in a national household survey. As a minimum, a national estimate for HIV infection was expected to be calculated for this age group.

2.5 Measures

Questionnaires used in the 2008 survey were similar to those used in the 2002 and 2005 surveys. A new questionnaire for mothers/guardians of children under two years of age was added (see Appendix 1 for a full description of modules contained in the questionnaire). The following six questionnaires were used:

- visiting point questionnaire: this questionnaire was used to record a household census of each study household and also of household level information. It was also used to select one participant from each age group represented in the household;
- questionnaire for mother/guardian of children under two years of age;
- questionnaire for parent/guardian of children 2–11 years of age;
- questionnaire for children 12–14 years of age;
- youth questionnaire for persons 15–24 years of age;
- adult questionnaire for persons 25 years of age and over.

As in 2002 and 2005, all questionnaires, information sheets and informed consent forms were translated into relevant local languages and pre-tested during the preparatory work.

2.6 Ethical approval

This study received Institutional Review Board (IRB) approval from the Research Ethics Committee (REC) of the HSRC (REC 2/23/10/07) and Human Subjects Review from the CDC's Global AIDS Programme before the fieldwork commenced. The REC has Federal-wide Assurance (FWA) for the Protection of Human Subjects accreditation with the USA's Department of Health and Human Services (DHHS).

2.7 Data analysis

The data were double-entered from the original questionnaires using the Census and Survey Processing System (CSPro), a computer software program. A database was designed with range restrictions to ensure that data captured were not out of range.

Weighted data were analysed using Stata version 10, taking into account the complex multilevel sampling design and adjusting for HIV-testing non-response. Stata software (svy) commands were used to obtain the estimates of HIV prevalence or proportions of responses and confidence intervals (95% CI). All p-values less or equal to 5% are considered statistically significant.

Tables and figures in the report present weighted percentages and unweighted counts.

To verify results, data analysis was carried out independently by at least two biostatisticians, and for HIV results, it was verified by a third off-site statistician.

Further details on the survey methodology, including ethical considerations, fieldwork procedures and quality control as well as laboratory methods, are provided in Appendix 1.

CHAPTER 3

Summary of population characteristics

3.1 Response analysis

Every effort was made to ensure that the survey achieved a high response rate. The strategies used included:

- notifying communities prior to the study and giving adequate explanation to potential respondents;
- utilising retired nurses, who are generally respected in communities, to facilitate fieldwork;
- utilising trained nurses to conduct interviews on sensitive subjects, including HIV/AIDS and sex;
- making a maximum of four revisits to each sampled household if necessary;
- using a linked anonymous survey approach;
- ensuring privacy when conducting interviews. Interviews were completed and specimens for HIV testing were taken from eligible respondents during the same session.

3.1.1 Household response rate

If the household/visiting point (VP) has been destroyed or vacated, there is no longer a household/VP that can be included in the response analysis at the household level. This is not considered to be a non-response. The household response rate and overall non-response is found by dividing the number of households/valid VPs with completed interviews by the number of occupied households/valid VPs.

Table 3.1 shows that of 15 000 households/VPs sampled, 13 440 were valid, occupied households, and 1 560 VPs were invalid or clearly abandoned households/VPs. Of the valid 13 440 households/VPs, 10 856 (80.8%) heads of households were interviewed using the VP questionnaire. Thus the household response rate for the 2008 survey was 80.8%. Proportions of non-response at household level were as follows:

- 1 252 (9.3%) refused to take part in the survey;
- 946 (7.0%) were valid households but unoccupied after four repeated visits;
- 386 (2.9%) involved other reasons.

Table 3.1 shows the household coverage and non-response rates for the reporting domains: race, locality type and province. All provinces had a VP response rate of 80% and above, except Free State (75.5%) and Gauteng (76.5%). Households were categorised by the race of the oldest respondent and locality type. White households had the lowest response rate, 59.0%, compared to coloured households with the highest response rate, 89.1%. Households in rural formal areas had the lowest response rate, 72.3%, and households in urban informal areas had the highest response rate, 89.5%.

3.1.2 Individual interview response rate

Of the 13 440 valid households/VPs that agreed to participate in the survey, 9 786 individuals 0–18 years of age were eligible to be interviewed. A total of 8 966 individuals (91.6%) completed the interview. Proportions of non-response were as follows:

- 426 (4.4%) refused to be interviewed;
- 258 (2.6%) were absent from the household;
- 136 (1.4%) were classified as missing/other.

Table 3.1: Household/VP response rates, South Africa 2008

Variable	Total VPs	Valid VPs		Interviewed		Refused		Absent/other	
	n	n	%	n	%	n	%	n	%
Households/VPs	15 000	13 440	89.6	10 856	80.8	1 252	9.3	1 332	9.9
Race									
African	8 056	6 974	86.6	6 081	87.2	327	4.7	568	8.1
White	3 007	2 721	90.5	1 604	59.0	607	22.3	509	18.7
Coloured	2 240	2 136	95.4	1 903	89.1	126	5.9	106	5.0
Indian	1 636	1 550	94.7	1 235	79.7	181	11.7	134	8.7
Other	33	33	100.0	33	100	0	0	0	0.0
Unknown	28	26	92.9	0	0.0	11	42.3	15	57.7
Total	15 000	13 440	89.6	10 856	80.8	1 252	9.3	1 332	9.9
Locality type									
Urban formal	9 360	8 772	93.7	6 858	78.2	1 008	11.5	906	10.3
Urban informal	1 455	1 323	90.9	1 184	89.5	40	3.0	99	7.5
Rural informal	2 655	2 322	87.5	2 074	89.3	81	3.5	167	7.2
Rural formal	1 530	1 023	66.9	740	72.3	123	12.0	160	15.6
Total	15 000	13 440	89.6	10 856	80.8	1 252	9.3	1 332	9.9
Province									
Western Cape	1 933	1 763	91.2	1 425	80.8	214	12.1	124	7.1
Eastern Cape	1 965	1 700	86.5	1 432	84.2	93	5.5	175	10.3
Northern Cape	1 125	951	84.5	806	84.8	58	6.1	87	9.2
Free State	1 126	976	86.7	737	75.5	95	9.7	144	14.8
KwaZulu-Natal	2 792	2 620	93.8	2 099	80.1	247	9.4	274	10.5
North West	1 122	992	88.4	838	84.5	72	7.3	82	8.3
Gauteng	2 478	2 331	94.1	1 789	76.5	305	13.1	237	10.2
Mpumalanga	1 124	999	88.9	817	81.8	73	7.3	109	10.9
Limpopo	1 335	1 108	83.0	913	82.4	95	8.6	100	9.3
Total	15 000	13 440	89.6	10 856	80.8	1 252	9.3	1 332	9.9

The breakdown of demographic characteristics for individual interview response rates is shown in Table 3.2.

The questionnaire response rate was high and ranged from 81.5% to 95.6%. The refusal rates were highest among Indian and white respondents. The response rate was high in all provinces, slightly lower in urban formal areas, and similar for males and females.

Table A3 (Appendix 3) presents the demographic profile of the children 0–18 years of age who were interviewed. Among those who were interviewed, slightly more males (50.6%) than females (49.4%) were interviewed. Almost two-thirds of those interviewed were African, followed by coloured, Indian and white respondents. The majority of respondents were from urban formal areas, followed by those in rural informal areas. The highest number of children interviewed was from KwaZulu-Natal.

Table 3.2: Individual interview response rates for children 0 to 18 years of age, South Africa 2008

Variable	Total	Interviewed		Refused		Absent/missing	
	n	n	%	n	%	n	%
Sex							
Male	4 939	4 538	91.9	218	4.4	183	3.7
Female	4 847	4 428	91.4	208	4.3	211	4.4
Total	9 786	8 966	91.6	426	4.4	394	4.0
Age group							
0–<2	1 715	1 630	95.0	48	2.8	37	2.2
2–4	1 436	1 373	95.6	35	2.4	28	2.0
5–11	2 882	2 685	93.2	107	3.7	90	3.1
12–14	1 491	1 310	87.9	96	6.4	85	5.7
15–18	2 262	1 968	87.0	140	6.2	154	6.8
Total (0–18)	9 786	8 966	91.6	426	4.4	394	4.0
Race							
African	6 172	5 793	93.9	171	2.8	208	3.4
White	798	660	82.7	77	9.7	61	7.6
Coloured	1 901	1 755	92.3	82	4.3	64	3.4
Indian	888	736	82.9	93	10.5	59	6.6
Other	27	22	81.5	3	11.1	2	7.4
Locality type							
Urban formal	5 665	5 062	89.4	333	5.9	270	4.8
Urban informal	1 135	1075	94.7	25	2.2	35	3.1
Rural informal	2 426	2 302	94.9	48	2.0	76	3.1
Rural formal	560	527	94.1	20	3.6	13	2.3
Province							
Western Cape	1 301	1187	91.2	73	5.6	41	3.2
Eastern Cape	1 369	1 255	91.7	35	2.6	79	5.8
Northern Cape	657	603	91.8	31	4.7	23	3.5
Free State	621	579	93.2	20	3.2	22	3.5
KwaZulu-Natal	1 844	1 689	91.6	88	4.8	67	3.6
North West	800	738	92.3	25	3.1	37	4.6
Gauteng	1 493	1 329	89.0	96	6.4	68	4.6
Mpumalanga	770	717	93.1	27	3.5	26	3.4
Limpopo	931	869	93.3	31	3.3	31	3.3

3.1.3 HIV testing response rate

Of the 9 786 eligible individuals, 5 756 (58.8%) agreed to provide blood specimens for HIV testing. The blood specimens were anonymously linked to the behavioural questionnaires. The categories of non-response were:

- 3 210 (32.8%) were interviewed, but they refused HIV testing;
- 426 (4.4%) refused both to be interviewed and to be tested for HIV;
- 394 (4.0%) were absent from the household or their data were missing.

Table 3.3 presents the 2008 HIV testing coverage and non-response for the sample of the population 0–18 years of age by the main reporting domains: sex, age, race, locality type and province. In addition to the categories for coverage (tested) and non-response (not tested), the table breaks down non-response by reason: refused or absent.

HIV-testing refusal was higher among males (38.2%) than females (36.1%). Coloured (71.8%) and African (60.6%) respondents were more likely to agree to HIV testing whereas only 36.3% of Indian and 39.7% of white respondents agreed to be tested. The group

Table 3.3: HIV testing coverage among respondents 0–18 years of age by various demographic characteristics, South Africa 2008

Demographic characteristics	Tested %	Not tested %			Total
		Refused	Absent	Missing/other	
Sex					
Male	58.1	38.2	2.4	1.3	4 939
Female	59.6	36.1	2.9	1.5	4 847
Age groups in years					
0–<2	45.7	52.2	1.1	1.1	1 715
2–4	51.7	46.3	0.9	1.0	1 436
5–11	59.4	37.5	2.0	1.1	2 882
12–14	64.7	29.6	4.0	1.7	1 491
15–18	68.7	24.5	4.9	2.0	2 262
Total (0–18)	58.8	37.2	2.6	1.4	9 786
Race					
African	60.6	36.0	2.5	0.9	6 172
White	39.7	52.6	4.9	2.8	798
Coloured	71.8	24.9	2.2	1.2	1 901
Indian	36.3	57.1	2.8	3.8	888
Other	37.0	55.6	0.0	7.4	27
Locality type					
Urban formal	56.5	38.7	2.7	2.1	5 665
Urban informal	64.1	32.8	2.7	0.4	1 135
Rural Informal	61.5	35.4	2.5	0.6	2 426
Rural formal	59.8	37.9	2.1	0.2	560
Province					
Western Cape	68.8	28.1	2.0	1.2	1 301
Eastern Cape	63.2	31.0	4.3	1.5	1 369
Northern Cape	77.5	19.0	2.7	0.8	657
Free State	55.4	41.1	2.9	0.6	621
KwaZulu-Natal	46.4	50.0	1.3	2.4	1 844
North West	61.6	33.8	2.0	2.6	800
Gauteng	53.9	41.6	3.6	1.0	1 493
Mpumalanga	57.8	38.8	2.5	0.9	770
Limpopo	58.5	38.1	2.8	0.5	931

15–18 years of age was the most likely to agree to be tested (68.7%), and the under-two-year age group the least (45.7%).

Among the provinces, Northern Cape had the highest participation rate (77.5%), while KwaZulu-Natal had the lowest participation rate (46.4%). The highest testing response rate was found in urban informal settlements (64.1%), followed by rural informal (61.5%), and the lowest in rural formal areas (59.8%) and urban formal areas (56.5%).

Non-response for HIV testing was highest among children under two years of age (52.2%). This is the first time ever that children under two years old have been included in the national household survey. Out of 1 715 eligible children, 780 parents/guardians were interviewed and agreed to have a blood specimen taken from the child and 840 parents/guardians agreed to only being interviewed, but refused HIV testing of the child. The majority of HIV-testing refusal was due to parents/guardians not wanting to have their children pricked. There is no viable alternative at this stage to test children under two to obtain a sample to test for HIV antibodies.

Given the low testing rates among children under two, further analysis was conducted to obtain response rates by key variables related to HIV status. This analysis was designed to detect bias in sampling. The results are shown in Table 3.4.

Analysis of differences among those tested compared to those not tested that focused on variables related to HIV status shows no statistically significant differences in rates of breastfeeding patterns for children, rates of hospitalisation in the last 12 months, rates of history of offer of HIV testing for mothers while they were pregnant with the child in the study, and rates of history of offer of voluntary counselling for HIV for children. These results suggest that although the response rate on HIV testing for children is very low, the lack of significant differences in key variables that would account for bias in selection between those tested and those not tested is an assurance that the results are valid.

Table 3.4: HIV risk-associated characteristics among respondents under two years of age who were interviewed and tested compared with those who were interviewed, but refused HIV testing

Variable	Tested for HIV		Not tested for HIV		P-values
	%	[95% CI]	%	[95% CI]	
Breastfeeding pattern for six months and younger					
Exclusive breastfeeding	26.8	[21.2–33.2]	29.0	[24.1–34.4]	0.59
Exclusive formula feeding	24.9	[19.5–31.2]	22.3	[18.0–27.4]	0.50
Mixed feeding	47.8	[41.1–54.6]	48.7	[43.0–54.3]	0.86
Hospitalised in the last 12 months?					
Yes	20.1	[16.9–23.7]	22.9	[19.7–26.3]	0.25
No	79.9	[76.3–83.1]	77.1	[73.7–80.3]	0.25
During antenatal care were you offered HIV testing?					
Yes	95.1	[93.1–96.6]	94.3	[92.3–95.9]	0.53
No	4.9	[3.4–6.9]	5.7	[4.1–7.7]	0.53
PMTCT coding on the card?					
Yes	6.2	[4.5–8.6]	6.5	[4.6–9.0]	0.88
No	93.8	[91.4–95.5]	93.5	[91.0,95.4]	0.88

There may still be other differences due to unmeasured variables that may influence the findings. However, studies that have examined the effect and potential bias in HIV-seroprevalence surveys due to non-response have shown that the effects of non-response tend to be higher in areas with low HIV prevalence (Mishra, Barrere, Hong et al. 2008). In South Africa, the epidemic is generalised and thus the effects of non-response are less likely to have substantial effects.

3.1.4 Comparison of the sample with the population from which it was drawn

The degree to which the findings from a household survey such as this one can be extrapolated to the entire South African population depends on the extent to which the sample is representative of the population. Table 3.5 compares the socio-demographic structure of the survey sample to the 2008 mid-year South African population estimates provided by Stats SA.[10] In this analysis, age groups were used to directly compare with those of Stats SA.

The socio-demographic characteristics of the weighted sample closely match those of the population estimates. The difference between the weighted sample and the 2008 mid-year population estimate did not exceed 0.1% when analysed by gender. This shows that the survey sample is representative of the general population of less than 20 years of age.

Table 3.5: Demographic characteristics of the sample compared to the 2008 mid-year population estimates

Age group (years)	Weighted sample				Mid-year population estimates 2008			
	Male		Female		Male		Female	
	%	n	%	n	%	n	%	n
0–4	50.6	2 602 526	49.4	2 537 319	50.6	2 600 739	49.4	2 539 061
5–9	50.6	2 658 380	49.4	2 595 820	50.6	2 658 575	49.4	2 595 525
10–14	50.5	2 666 269	49.5	2 612 539	50.5	2 665 845	49.5	2 613 056
15–19	50.4	2 596 483	49.6	2 556 197	50.4	2 596 961	49.6	2 555 739
Total (0–19)	50.5	10 523 658	49.5	10 301 875	50.4	10 522 119	49.6	10 303 381

10 http://www.paho.org/english/ad/fch/ca/gSiYCF_infantfeeding_eng.pdf

Results

4.1 Maternal health

Maternal death is correlated with poor health care during pregnancy and childbirth (World Bank 2009). The World Bank recommends that a pregnant woman should have at least four antenatal assessments by a skilled attendant during her pregnancy (World Bank 2009).[11] These assessments are usually done in a health-care facility. Table 4.1 presents antenatal care (ANC) visit information as well as prevention of mother-to-child transmission (PMTCT) services reported by participants. (A detailed description of an antenatal package is contained in Section 1.4.3).

In the 2008 population-based survey, just over 97% of mothers of children under two years of age reported that they received ANC during their pregnancy. Nearly three-quarters (71.4%) reported that they had received antenatal services five times during pregnancy, while 15.7% said they had visited the health facility four times.

Women are expected to start their antenatal visits during the first trimester of pregnancy.[12] In this study, the gestational age at the first trimester of care method was not used. Instead, the South African Department of Health guideline of fewer than 20 weeks of

Table 4.1: Antenatal care by a skilled attendant during pregnancy

Variable	n	Percentage (%)
Did you receive antenatal care during pregnancy?		
Yes	1 255	97.1
No	43	2.9
If yes, how many antenatal care visits did you attend?		
One visit	20	2.0
Two visits	19	2.3
Three visits	84	8.6
Four visits	192	15.7
Five visits	944	71.4
At what point in your pregnancy did you first go for antenatal care visits?		
Fewer than 20 weeks gestation	644	46.5
More than 20 weeks gestation	468	39.3
More than 30 weeks generation	146	14.2
During antenatal care, were you offered an HIV test?		
Yes	1 187	95.5
No	66	4.2
Refused to answer or don't know	7	0.5
Is there any indication that the child on the card was tested for HIV?		
Yes	76	8.0
No	1 066	92.0

11 WHO http://www.who.int/making_pregnancy_safer/publications/Standards1.6N.pdf
12 WHO http://www.who.int/making_pregnancy_safer/publications/Standards1.6N.pdf

gestation instead of 12 weeks of pregnancy was used. Using this criterion, 46.5% of women reported having started ANC within the first 20 weeks of gestation, whilst 39.3% started care at more than 20 weeks of gestation, but fewer than 30 weeks.

Given the high rate of HIV among pregnant women in South Africa, questions were asked about whether women were offered HIV testing during ANC. It was encouraging that 95.5% reported having been offered an HIV-antibody test.

4.1.1 Discussion

According to the World Bank, prenatal care coverage is defined as the percentage of women who were attended to by skilled health personnel for pregnancy-related issues during pregnancy. In this study, it was found that the overwhelming majority of women have access to maternal health services, are served by a skilled attendant and deliver in health-care facilities. Furthermore, pregnant women are accessing maternal health services at sufficient frequencies and are offered HIV-antibody testing. This is in line with the government policy on universal access to health care for pregnant and lactating women.

Despite the high levels of health facility access, the country is unlikely to achieve the Millennium Development Goal of reducing maternal mortality by three-quarters by 2015 (using 1990 as the baseline). Notably, the maternal mortality ratio has increased from 104 to 400 per 100 000 live births between 2002 and 2005 (Day & Gray 2006).

There are possibly two major reasons for the country's poor performance on maternal health outcomes: high levels of HIV and poor quality of health care. At 29% in 2008, there is a very high level of HIV prevalence among pregnant women (DOH 2009) and this would account for the high mortality in the absence of an early start to antiretroviral therapy at CD4 count below 350 mm cells/mm^3, as has recently been recommended by government. The second major issue relates to the poor quality of health care. In one province, staff reported the following maternity service incidents in public health care facilities: eclampsia due to delayed caesarean section (19%), uncontrolled bleeding (13%), patients discharged with retained products (6%), blood-giving set not available (6%) and no doctor, resulting in a patient being transferred (6%) (personal communication to Dr Olive Shisana, Council for Health Services Accreditation of Southern Africa-COHSASA 4 July 2008).

Introducing a policy on providing HIV-positive women with antiretroviral therapy when their CD4 count drops to below 350 mm cells/mm^3 might save many women's lives. Furthermore, introducing a quality improvement and quality assurance system in all maternity care units or clinics is crucial to ensuring women obtain good health services. The country should also consider implementing the latest WHO recommendation that HIV-positive mothers or their infants take antiretrovirals while breastfeeding to prevent transmission (WHO 2009a).

4.2 Infant and child health

4.2.1 Birth details of children

The United Nations Population Fund (UNFPA 2008) argues that up to 15% of all births are complicated by the risk of a treatable fatal condition. For this reason, skilled attendance at all births has been noted as vital in the attempt to ensure survival for both mother and baby (WHO 2009b).

Figure 4.1: Place of birth for children under two years of age

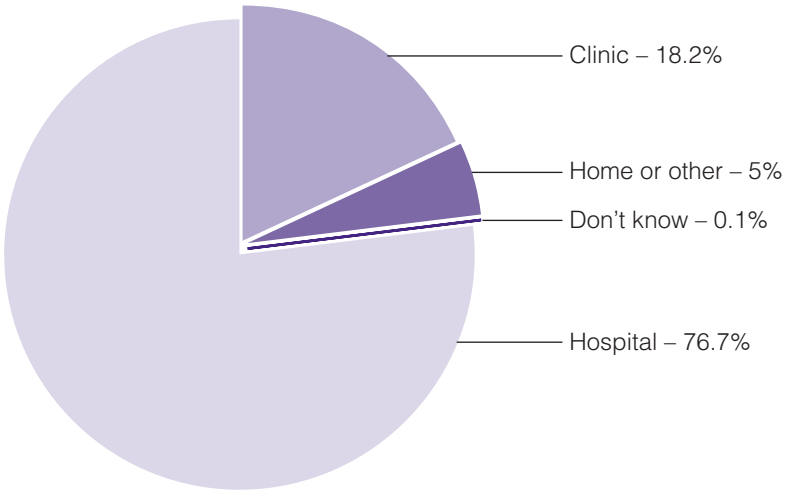


Table 4.2: Birth details of children under two years of age, South Africa 2008

Variable	Percentage (%) [95% CI]	
Where a child was born (n = 1 605)		
Hospital	76.7	[73.1–79.9]
Clinic	18.2	[15.3–21.7]
Home or other	5.0	[3.7–6.8]
Don't know	0.1	[0.0–0.4]
Attendant at delivery (n = 1 609)		
Doctor	27.6	[24.5–30.9]
Nurse/midwife (health-care worker)	66.7	[63.2–69.9]
Traditional birth attendant or other	4.7	[3.4–6.5]
Don't know	1.0	[0.6–1.9]

Figure 4.1 and Table 4.2 show the birth details of children under two years of age. They show that the majority of South African children under two years of age (76.7%) were born in hospitals and a few were born at clinics. The practice of delivering at home is not common, with only 5.0% reporting that this occurred. The overwhelming majority of children under two years of age in South Africa (94.3%) were delivered by a skilled attendant, two-thirds (66.7%) by a nurse or midwife and 27.6% by doctors. Traditional birth attendants seem to play a minor role in the delivery of babies in South Africa. If the quality of health services provided at this stage was good, one would expect that the risk of mortality would be reduced.

4.2.2 Immunisation of infants under two years of age

Data on infant immunisation were collected by the interviewer asking the parent/guardian whether they could see a Growth Chart/Road to Health Card or some other record of vaccination. If the card was seen by the interviewer, the dates of the vaccinations were recorded directly from the card on to the questionnaire. If the card was not seen or

there was no card, the respondents were asked whether the child was given each of the vaccinations on the list. Thus two methods of estimating immunisation coverage were used in the tables that follow. The first method was based on examination of the clinic card by nurses (presence of a date recorded from the cards indicated that the child was immunised, whilst the absence of a date was assumed to indicate that the child was not immunised) (Table 4.3a). There were 766 children between 12 and 23 months of age. The second method used the interview questions on recall/history (Table 4.3b). In addition, the combination of these two methods (cards or recall/history) was also used to estimate immunisation coverage. The combination of the two methods was compared with the WHO/UNICEF (2009) estimates for 2008 immunisation coverage shown in Table 4.3c.

Using BCG as an example, 85.5% of children were reported as immunised with BCG in the combined method using card or recall/history (Table 4.3c). If the date of immunisation as recorded from the card was used, then 74.0% were reported as immunised (Table 4.3a). However, if this information was complemented by recall/history (86.1% in Table 4.3b) (for instance a 'no' on the card but a 'yes' on recall), the reported immunisation for the combined analysis was higher (85.5% in Table 4.3c).

The combined analysis in Table 4.3c shows the immunisation status among children 12–23 months of age by specific immunisations. The third column shows that the coverage of various immunisations as estimated by WHO/UNICEF for South Africa in 2008

Table 4.3a: Immunisation status among children 12–23 months of age by specific vaccines using card only, South Africa 2008

Antigen	Confirmation method	Sample size	Percentage (%) coverage [95% CI]
BCG (Bacillus Calmette-Guérin)	Card	766	74.0 [68.8–78.6]
DPT1 (Diabetes prevention trial – Type 1)	Card	766	63.6 [57.8–69.0]
DPT3 (Diabetes prevention trial – Type 3)	Card	766	55.3 [49.9–60.6]
Polio3 (Poliomyelitis)	Card	766	58.9 [53.1–64.6]
Measles-containing vaccine	Card	766	56.5 [51.0–61.8]
HepB3 (Hepatitis B)	Card	766	49.7 [44.2–55.3]
Hib3 (Haemophilus influenzae type B)	Card	766	40.1 [35.0–45.5]

Table 4.3b: Immunisation status among children 12–23 months of age by specific vaccines using only recall/history, South Africa 2008

Antigen	Confirmation method	Sample size	Percentage (%) coverage [95% CI]
BCG	Recall/history	217	86.1 [76.0–92.4]
DPT1	Recall/history	196	76.5 [65.4–84.9]
DPT3	Recall/history	175	65.9 [53.5–76.4]
Polio3	Recall/history	180	69.1 [56.8–79.2]
Measles-containing vaccine	Recall/history	171	68.7 [56.9–78.5]
HepB3	Recall/history	157	56.3 [42.8–69.0]
Hib3	Recall/history	147	48.1 [35.9–60.5]

Table 4.3c: Immunisation status among children 12–23 months of age by specific vaccines using card or recall/history, South Africa 2008

Antigen	Confirmation method	WHO/ UNICEF (2009) estimates for 2008	Sample size	Percentage coverage [95% CI]		Percentage card seen [95% CI]	
BCG	Card or history	81.0	776	85.5	[81.3–89.0]	69.1	[63.6–74.2]
DPT1	Card or history	77.0	776	72.8	[67.0–77.9]	69.1	[63.6–74.2]
DPT3	Card or history	67.0	776	62.6	[56.9–67.9]	69.1	[63.6–74.2]
Polio3	Card or history	65.0	776	67.2	[61.1–72.8]	69.1	[63.6–74.2]
Measles-containing vaccine	Card or history	62.0	776	64.8	[59.4–69.9]	69.1	[63.6–74.2]
HepB3	Card or history	67.0	776	56.3	[50.3–62.1]	69.1	[63.6–74.2]
Hib3	Card or history	67.0	776	45.2	[39.8–50.7]	69.1	[63.6–74.2]

(WHO/UNICEF 2009). The results were nearly the same for all vaccinations except for HepB3 and Hib3, which were respectively about 10% and 20% lower than the WHO/ UNICEF estimates.

The results indicate that children were more likely to receive BCG than any other vaccination. DPT vaccination was low at 72.8%, but the situation becomes worse as it seems children are not being brought back for booster vaccinations at later periods. In fact, it appears there is a substantial decrease – to 62.6% for DPT3. Vaccination against measles was lower than expected. Since all children are expected to have been vaccinated against all these diseases, the figures obtained were mostly lower than the target of below 90% (WHO/UNICEF 2009), even for hepatitis and liver disease.

4.2.3 Infant feeding practices among infants six months of age

Feeding practices have an impact on nutritional status, growth and health status and consequently the survival of children. Research shows that infants who are breastfed exclusively for a period of longer than six months tend to show, among other things, a higher mean body mass index and triceps skin-fold thickness compared to those who are mixed fed or not breastfed, who tend to have a higher risk of infections (Kramer, Matush, Bogdanovich et al. 2009). Mixed feeding means that a child was given breast milk, formula milk and other solid foods. The results in Table 4.4 show the different practices for feeding infants six months of age. More than half of the children were mixed fed, a quarter were exclusively breastfed, and more than one in five were exclusively formula fed.

Table 4.4 also shows that exclusively breastfeeding and exclusive formula feeding were most common in urban informal settlements, while mixed feeding rates were high in urban formal areas, rural formal and rural informal areas. However, some caution is urged because of small numbers of respondents involved in the study who were from both urban informal settlements and rural informal areas.

Table 4.4: Feeding practices among infants during the first six months among children six months of age or less, South Africa 2008

Type of feeding	n	Exclusive breastfeeding % [95% CI]	Exclusive formula fed % [95% CI]	Mixed feeding % [95% CI]
Total	508	25.7 [21.3–30.8]	22.5 [17.9–28.0]	51.3 [45.4–57.2]
Urban formal	259	22.6 [15.6–31.4]	20.7 [11.5–30.5]	56.7 [46.7–66.2]
Urban informal	66	39.4 [27.6–52.6]	36.1 [24.4–49.7]	24.5 [14.8–37.9]
Rural formal	143	27.2 [20.9–34.6]	20.2 [13.9–28.4]	51.6 [43.3–59.7]
Rural informal	40	19.3 [9.9–34.4]	28.5 [15.1–47.0]	52.2 [32.8–71.0]

Wet nursing

As wet nursing puts a baby at risk of HIV infection, the respondents were asked whether the children had been breastfed by another woman. Almost all of the children, 99.0% (95% CI: 97.3–99.6), had never been breastfed by another woman, while only 0.4% (95% CI: 0.1–1.5), 0.1% (95% CI: 0.0–0.5) and 0.5% (95% CI: 0.1–2.5) of children had been breastfed by another woman once, twice and more than twice respectively. Also, amongst women 15–49 years of age, only two women reported having breastfed a child other than their own.

Source of formula

When the mothers who exclusively formula fed their children were asked about the source of the formula used to feed their children, it was found that a large majority of the respondents, 86.4% (95% CI: 82.2–89.7), bought their own formula, while only 12.5% (95% CI: 9.3–16.6) indicated that they had received it from a government clinic and 1.1% (95% CI: 0.6–2.3) from other unspecified sources.

When asked if there was a time when no formula was available, only 16.4% (95% CI: 12.4–21.3) out of 568 respondents indicated that this had been the case, with 17.4% (95% CI: 11.4–25.5) of the 279 mothers/guardians of male infants responding in the affirmative compared to 15.5% (95% CI: 10.8–21.9) of the 289 mothers/guardians of female infants who did so.

Initiation of solids

Children are expected to be fed solids when they are older than six months of age. The results in Table 4.5 suggest that children are given solids too early, some as early as when they are younger than one month of age, and others at one or two months of age. Of the 263 children who were not exclusively breastfed or formula fed, the largest proportion were fed solids when they were three, four and six months of age.

Table 4.5: Age when solids were introduced to children under six months of age, South Africa 2008

Age	Percentage (%) [95% CI]
Birth	4.3 [2.6–7.0]
One month	8.8 [6.5–11.7]
Two months	9.9 [7.5–13.0]
Three months	24.1 [20.0–28.7]
Four months	20.4 [16.7–24.7]
Five month	7.4 [5.4–10.2]
Six months	25.1 [21.1–29.7]

4.3 Health status of children

Using an internationally recognised question on health status, the survey assessed the perceived health status of children in South Africa. When dealing with children in surveys, information is usually gathered through proxy respondents, namely, mother or carer (Berra, Borrell, Rajmil et al. 2006). Table 4.6 shows the health status of children 2–18 years of age, according to sex, varying from excellent to poor health. The table shows that the overwhelming majority of the children 2–18 years of age had reported a health status of either excellent or good for both sexes (93%–94%). Although only very small minorities reported to have either fair or poor health, significantly higher proportions of males in all age groups reported to have either fair or poor health compared to their female counterparts.

Children may be taken to a health-care provider for a variety of reasons such as for health checks, immunisation or due to ill-health. As expected, younger children were significantly more likely than older children to be seen by health personnel in the six months prior to the survey. The possible reason why more children 2–11 years of age (42.3%) visited a health-care provider within those six months could be for vaccinations they received at health clinics or hospitals, in comparison to groups 12–14 years of age (35.3%) and 15–18 years of age (32.2%). Similar findings were observed for periods between six months and less than one year. It was found that 13.3% of children 2 to 18 years of age had never visited a health-care provider (Table 4.7). On further analysis of this group, it was found that 98% indicated that their health status was excellent or good.

4.3.1 Health care utilisation

Data on recency of health care utilisation for children 2–18 years of age are shown in Table 4.7. Children 2–11 years of age visited health-care facilities in the six months prior to the survey at significantly higher rates than those observed among those 12–14 and 15–18 years of age.

Table 4.6: Health status of children by sex and age group, South Africa 2008

Sex	Age group (years)	n	Excellent (%) [95% CI]	Good (%) [95% CI]	Fair (%) [95% CI]	Poor (%) [95% CI]
Male	2–4	701	34.8 [30.1–39.8]	58.4 [53.1–63.5]	6.7 [4.1–10.8]	0.1 [0.0–0.5]
	5–11	1 243	32.1 [28.4–36.0]	59.0 [54.9–63.1]	7.3 [5.4–9.9]	1.5 [0.7–3.5]
	12–14	599	45.5 [39.5–51.8]	49.8 [43.9–55.8]	4.3 [2.7–7.0]	0.3 [0.0–2.0]
	15–18	902	48.3 [43.6–53.1]	42.4 [37.7–47.3]	8.4 [6.0–11.7]	0.8 [0.3–2.2]
	Total	3 445	39.0 [36.4–41.7]	53.2 [50.4–56.0]	6.9 [5.7–8.4]	0.9 [0.5–1.7]
Female	2–4	599	40.7 [34.9–46.8]	54.1 [48.2–59.8]	4.8 [3.0–7.5]	0.4 [0.1–1.6]
	5–11	1 245	35.2 [31.2–39.4]	59.9 [55.6–64.1]	4.4 [3.1–6.3]	0.5 [0.2–1.2]
	12–14	646	42.3 [36.5–48.4]	53.0 [46.7–59.2]	4.0 [2.5–6.3]	0.7 [0.2–2.7]
	15–18	910	44.9 [40.4–49.4]	50.6 [46.0–55.1]	3.8 [2.5–5.7]	0.8 [0.3–1.7]
	Total	3 400	39.7 [37.1–42.4]	55.5 [52.8–58.1]	4.2 [3.4–5.3]	0.6 [0.3–1.0]

Table 4.7: The last visit to health personnel, children 2–18 years of age, South Africa 2008

Age group	When was the last time you went to see health personnel (doctor, nurse, traditional healer, and so on)?							
	n	Within the past six months [95% CI]		More than six months but not more than a year ago [95% CI]		One year ago [95% CI]		Never [95% CI]
2–11	3 781	42.3	[39.8–44.8]	18.1	[16.2–20.2]	29.1	[26.8–31.5]	10.6 [9.0–12.3]
12–14	1 245	35.3	[31.5–39.3]	13.1	[10.6–16.1]	35.7	[31.7–39.8]	16.0 [12.9–19.6]
15–18	1 807	32.2	[29.2–35.3]	13.4	[11.3–15.8]	36.7	[33.6–39.9]	17.7 [15.1–20.6]
Total	6 833	38.5	[36.6–40.5]	16.0	[14.6–17.4]	32.2	[30.4–34.1]	13.3 [11.9–14.8]

Table 4.8 shows the use of different health facilities and the number of times children under two years of age attended health-care services in the year prior to the study. On average, 23.8% of children visited hospitals, with an average number of visits of almost two per year, while 66.9% of the children visited a public outpatient clinic, with an average number of visits of 3.9 times per year compared to 22.6% of children who visited a private outpatient clinic, with an average number of visits of three times per year. A few children (12.5%) visited a pharmacist more than two times per year, while only 5.6% of the children visited a traditional healer (this was done fewer than two times per year).

The visits to outpatient clinics are very frequent at nearly four visits per year and visits to general practitioners come second at three per year.

The above findings also show that most South African children relied on other primary health-care services for their health-care needs. Many pharmacies now have nurses who give vaccinations and treat minor illnesses. In addition, the rate of reported visits to traditional healers was low at about 5%.

When parents or guardians of children two years of age or older were asked where their children obtained health care, it became evident that the majority were seen in public primary health-care facilities, followed by private health care facilities, a clinic or a doctor (Table 4.9). It is notable that children were three times more likely to go to a public health facility for care than to private clinics or general practitioners (GPs). The younger the child, the greater the probability that he or she was seen in a public primary health-care facility; however, the differences were not statistically significant. Older children,

Table 4.8: Health care utilisation in the 12 months prior to the study for children under two years of age, South Africa 2008

Facility	n	Percentage visited health-care provider [95% CI]	Average mean number of times* visited provider [95% CI]
Hospital	979	23.8 [20.1–28.0]	1.9 [1.7–2.2]
Public outpatient clinic	1 320	66.9 [62.8–70.9]	3.9 [3.7–4.2]
Private outpatient clinic (GP)	961	22.6 [18.7–27.0]	3.0 [2.5–3.5]
Pharmacist	875	12.5 [9.4–16.3]	2.4 [2.1–2.7]
Traditional healer	866	5.6 [3.7–8.4]	1.8 [1.6–1.9]

*Note: * The same child might have visited more than one type of facility within the year.*

Table 4.9: Usual source of health care for children 2–18 years of age, South Africa 2008

Age group	Source of health care									
	n	Public hospital (%)		Private hospital (%)		Public clinic or doctor (%)		Private clinic or doctor (%)		Other (%)	
2–4	1 290	8.8	[6.4–12.0]	2.5	[1.7–3.6]	66.5	[62.4–70.3]	21.2	[18.1–24.7]	1.0	[0.5–2.1]
5–11	2 479	9.5	[8.0–11.3]	3.4	[2.4–4.8]	63.3	[60.0–66.5]	23.0	[20.3–25.9]	0.8	[0.5–1.4]
12–14	1 228	11.4	[8.7–14.8]	3.2	[2.0–5.3]	63.6	[58.8–68.2]	20.1	[16.5–24.3]	1.7	[0.8–3.4]
15–18	1 785	13.6	[11.3–16.3]	3.5	[2.2–5.5]	59.5	[55.7–63.3]	20.4	[17.4–23.8]	3.0	[2.0–4.5]
Total (2–18)	6 782	10.7	[9.6–12.0]	3.2	[2.5–4.2]	62.9	[60.5–65.4]	21.5	[19.5–23.7]	1.5	[1.2–2.0]

compared to children under two years of age, were slightly more likely to be seen in a public hospital, but the differences were not significant.

Further analyses focused on levels of hospitalisation. Table 4.10 shows the proportion of children hospitalised by age group in the 12 months prior to the study. There were generally low levels of hospitalisation for children aged 2 years and older found, with fewer than 5% reporting that they had been hospitalised. The differences in average length of stay in hospital, though appearing to be large, were not statistically significant. As expected, HIV-negative children, compared to HIV-positive children, were less likely to be hospitalised. Specifically, among children 0–18 years of age, 4.7% (95% CI: 4.0–5.5) of HIV-negative children were hospitalised compared to 17.0% (95% CI: 9.8–27.9) of HIV-positive children who were hospitalised.

Levels of hospitalisation at 21.2% were high for children under two years of age and stays in hospital averaged 6.8 days. This suggests that this group had a high morbidity rate. It can be argued that children under two years of age might have visited hospitals as outpatients or attended primary care services. Possible reasons that might account for this high rate of hospitalisation were explored. The HIV status of the hospitalised and non-hospitalised children were compared and it was found that those who were hospitalised were three times more likely to be HIV positive when compared with those who were not hospitalised. Children under two years of age who were hospitalised in the 12 months prior to the study had an HIV prevalence of 7.2% (95% CI: 2.8–17.2), while the level for non-hospitalised children was 2.3% (95% CI: 0.8–6.0).

Table 4.10: Proportion of children hospitalised by age group in the 12 months prior to the study

Age group (years)	n	Yes (%) [95% CI]		Length of stay in days [95% CI]	
0–<2	1 161	21.2	[18.2–24.7]	6.8	[4.7–8.9]
2–4	1 297	4.1	[2.9–5.7]	12.5	[0–26.5]
5–11	2 488	2.5	[1.8–3.5]	6.5	[2.8–10.2]
12–14	1 244	3.7	[2.3–5.8]	5.2	[2.0–8.4]
15–18	1 812	4.7	[3.5–6.3]	4.5	[3.1–5.8]
Total (0 to 18)	8 002	5.3	[4.7–6.0]	6.4	[5.1–7.8]

Table 4.11: Health status of children by history of hospitalisation among children 2–18 years of age, South Africa 2008

Age group	n	Health status	Percentage hospitalised [95% CI]
2–11	2 041	Excellent/good	2.5 [1.7–3.5]
	149	Fair/poor	9.2 [4.6–17.7]
12–14	867	Excellent/good	3.2 [2.1–5.1]
	45	Fair/poor	4.2 [1.2–13.6]
15–18	1 298	Excellent/good	4.5 [3.1–6.4]
	102	Fair/poor	15.5 [8.1–27.5]
2–18	4 206	Excellent/good	3.1 [2.5–3.8]
	296	Fair/poor	9.8 [6.1–15.4]

One measure of validating the hospitalisation findings is to link them to perceived health status. Table 4.11 shows the relationship between the perceived health status of children and the history of hospitalisation. The level of hospitalisation was up to three times higher among those who were reported to have poor health status compared to those who were reported to have an excellent or good health status. Analysis by age showed that the differences were largest among those 2–11 and 15–18 years of age, but not among those 12–14 years of age.

Among the 367 children 2–11 years of age who had never seen health personnel, 98.2% (95% CI: 95.7–99.7) of their parents/guardians reported their health status as good or excellent.

Another measure of health status of children was based on diagnostic history. Children 12–18 years of age and the parents/guardians of children below 12 years of age were asked whether a health-care provider had diagnosed them and/or their children, respectively, with any conditions, and if so, if they were given any medication. Table 4.12 presents the results. Few parents/guardians reported diagnosed conditions. Allergies were the most widely reported health condition and were mentioned by only 4.4% of the children. Asthma was the condition that was medicated by the largest majority of those with a diagnosed health condition (80.2%). This finding is in line with the perceived good health status reports in this age group.

Table 4.12: Diagnosed health conditions of children 2–18 years of age

Health condition*	Condition reported		Condition medicated	
	n	Yes (%) [95% CI]	n	Yes (%) [95% CI]
Attention problems	6 818	1.2 [0.9–1.6]	64	12.3 [5.2–26.2]
Asthma	6 813	2.6 [2.1–3.1]	229	80.2 [70.8–87.1]
Allergies	6 819	4.4 [3.7–5.1]	403	48.7 [41.4–55.9]
Learning problems	6 812	1.4 [1.1–1.9]	61	16.0 [7.7–30.5]
Vision problems	6 790	2.3 [1.9–2.8]	152	40.0 [29.3–51.9]
Other conditions**	6 850	6.6 [5.7–7.5]	390	29.8 [23.8–36.6]

*Notes: * Only reported for conditions where N > 100.*

*** The following conditions were reported in < 100 children (anxiety, behavioural problems. chronic orthopaedic bone or joint problems, chronic respiratory lung or breathing problems – not asthma, chronic rheumatic disease, depression, developmental delay or mental retardation, diabetes, epilepsy, hearing impairment or deafness, sleeping problems, speech problems, TB, other) and were combined.*

4.4 Discussion on the health of children (HIV excluded)

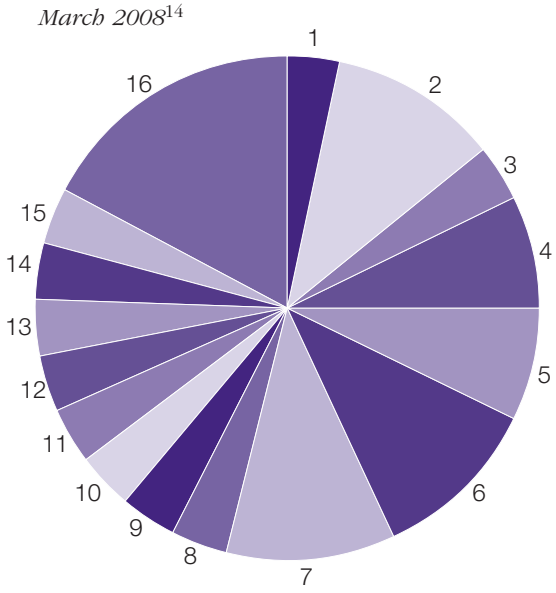
4.4.1 Place of birth and presence of a skilled attendant

The single most important intervention for ensuring safe motherhood and the consequent prevention of complications at childbirth is the presence of a skilled attendant.[13] The skilled attendant is trained in midwifery (Carlough & McCall 2005). Skilled attendants are trained to detect birth-related problems early when the situation can still be controlled. They can also provide interventions in the form of equipment and/or medication in order to manage the condition that could prove harmful to the mother and baby (WHO 2009b; UNFPA 2008). In addition, skilled attendants refer advanced life-threatening cases to higher levels of care for management if they are not skilled to provide the necessary help (WHO 2009b).

In this study, the majority of children under two years of age were reported to have been born in hospitals with the assistance of skilled birth attendants. Given the extensive use of skilled attendants, a low rate of mortality would be expected. However, South Africa has a neonatal mortality rate of 21 per 1 000 live births and 23 000 stillbirths each year. The major causes of these deaths reported in 2008 were preterm birth complications (40%), birth asphyxia (23%), infections (19%) and congenital abnormalities (10%) (Chopra, Daviaud, Pattinson et al. 2009).

Although the facilities are available and women have access to them, it appears the services provided are insufficient to save the lives of these babies. For this reason, it is critical that the standards for maternal health and newborn care should be improved as part of the Department of Health's 10-point plan. Financial resources should be made available, particularly as those from the process of accreditation by Council for Health Service Accreditation of Southern Africa (COHSASA) (see Figure 4.2) revealed serious inadequacies of the health-care system such as guidelines not being followed, health facilities not adequately equipped, and a lack of doctors at the time when they are needed.

Figure 4.2: Examples of incidents reported by maternity departments between September 2007 and March 2008[14]



1 Patient fully dilated; doctor cannot apply suction or forceps: 4%
2 Maternal deaths: 12%
3 Blood giving set not available when needed: 4%
4 Septic cases post-surgery: 8%
5 Uncontrolled bleeding post-Caesarean section: 8%
6 Eclampsia delayed Caesarean section: 12%
7 Power failure: 12%
8 Mother delivered in bed; baby not breathing for 10 minutes: 4%
9 No doctor; patient transferred; delivered fresh stillborn baby: 4%
10 No doctor; patient transferred; delivered baby in ambulance; no oxygen in ambulance: 4%
11 Patient discharged with retained products: 4%
12 Needlestick injury: 4%
13 Critically sick patient to be ventilated; no resuscitator available: 4%
14 Equipment not available: 4%
15 Delay in transfer; baby died: 4%
16 Delay in transfer; foetal distress: 19%

13 http://www.unfpa.org/mothers/skilled_att.htm
14 Source: Council for Health Service Accreditation of Southern Africa: Quality Improvement and Accreditation, 2008 (unpublished)

4.4.2 Immunisation against childhood diseases

The coverage for measles and BCG in this study was comparable to the coverage estimates provided by WHO/UNICEF (2009). While DPT1, DPT3 and Polio3 were also not significantly different from the WHO/UNICEF estimates, substantially lower coverage was reported from our study for HepB3 and Hib3.

However, the relatively low level of measles immunisation spells danger for not only children, but also for adults over 40 years of age. This is particularly worrying as South Africa does not have a policy of booster immunisation against measles during the teenage years. The recent outbreak of measles in Gauteng is a reflection of low immunisation rates against measles. If measles immunisation is taken as an indicator of failure to prevent childhood illnesses, we clearly have a major problem on our hands.

4.4.3 Infant feeding

Although women have a choice about the type of feeding for their infants, most still practise breastfeeding for fear of stigmatisation, family pressure, the inconvenience of preparing formula feed and sometimes a lack of education from health workers (Muko, Tchangwe, Ngwa & Njoya 2004). Although breastfeeding increases the survival chances and the health of a child by decreasing infant morbidity and mortality rates, it still is a major route of mother-to-child transmission of HIV (Bland, Little, Coovadia et al. 2008; Coovadia, Rollins, Bland et al. 2007; WHO 2003). In the current study, a high percentage of children below six months of age were mixed fed compared to those who either were exclusively formula fed or exclusively breastfed.

In some cultures, wet nursing is a common practice that carries a risk of infecting the infant if the wet nurse is infected by HIV. A study conducted in the Free State on HIV risk exposure among children 2–9 years of age showed a strong association between being breastfed by a non-biological mother and a baby's HIV status, with the odds of HIV-positive babies being breastfed by a non-biological mother 17 times higher than for HIV-negative babies (Shisana, Mehtar, Mosala et al. 2005). In the Free State study, seven children were found to be HIV positive although their mothers were HIV negative and further analysis revealed that at some stage, five of those children were breastfed by someone other than their mother. In this study, only two women said that they had breastfed a child other than their own.

It has been shown that formula feeding is the best way to avoid HIV transmission from a mother to her newborn through breast milk (Linkages 2004). However, breastfeeding is a common practice in most developing countries and it provides good nutrition. Therefore, both WHO and UNICEF recommend that HIV-infected mothers exclusively formula feed their babies to reduce HIV transmission from mother to infant through breast milk. In Qaukeni District in the Eastern Cape, 41.2% of HIV-positive women chose to exclusively formula feed their babies, while only 8% chose to exclusively breastfeed their babies (Peltzer, Mosala, Dana & Fomundam 2008). In this study, 22.5% of babies were reported to be exclusively formula fed and 25.7% exclusively breastfed. Although formula feeding reduces the risk of mother-to-child transmission, the shortage of formula at most clinics is a problem, as was observed in a study conducted in the Kouga Local Service Area in the Eastern Cape, where only 63% of the clinics had an adequate supply of formula (Peltzer, Phaswana-Mafuya, Ladzani et al. under review).

In South Africa, mixed feeding was associated with a high risk of HIV in young children in the first three months of life compared to exclusive breastfeeding (Coutsoudis, Pillay, Kuhn

et al. 2001). The study found that infants who were breastfed for at least three months had a lower HIV transmission risk at six months of age (19.4%) than those who also received other foods and fluids in addition to breast milk (26.1%). In the current study, the majority of children below six months of age were mixed fed compared to those who were exclusively formula fed and exclusively breastfed. This is similar to previous studies in other parts of Africa. A study conducted on feeding patterns in Zimbabwe showed that if mixed feeding, breastfeeding mixed with solids or feeding animal milk, was practised in the first three months of a baby's life, the risk of HIV infection at six months was four times higher than when children were exclusively breastfed (Iliff, Piwoz, Tavengwa et al. 2005).

4.4.4 Perceived health status

The perceived health status of the children in South Africa in this study was reported to be generally good or excellent. This finding is supported by findings reported by Stats SA in a 2004 survey that found that the perceived health status was good, with 57.8% of children 0–17 years of age reporting to have excellent health, 36.5% reporting to have good health and only 5.7% reporting to have poor health (Stats SA, 2004). This was corroborated by the generally low levels of morbidity among the children, as was measured by diagnosed medical conditions, the rate of hospitalisation and the length of time since the last visit to a health provider. These findings are novel, as a population-based national health survey of this kind among children 2–18 years of age has not been conducted previously. These findings show that in general South African children older than two years of age are healthy. Although children appear to be healthy, the high child (infant and under-five) mortality rate tells a different story (Chopra, Daviaud, Pattinson et al. 2009). The high mortality rate among children is largely due to HIV/AIDS. The majority of South African children are not HIV positive, but for those who are HIV positive, mortality during the first five years is high. This might explain the contradiction in the finding of a healthy population, but the high mortality for children under five years of age (Villamor, Misegades, Fataki et al. 2005; Zaba, Whithworth, Marston et al. 2005).

4.4.5 Health care utilisation

A second finding, which was expected, was that the public sector provided care to the majority of children. South Africans' use of public health-care services had almost doubled over the eight years prior to the study, with 101 million visits to clinics being recorded over the 2006/07 financial year (DOH 2008b).

The majority of children visited public outpatient clinics (66.9%) compared to 22.6% of children who visited private outpatient clinics. This could be due to affordability issues. Free primary health care is provided for children and expectant mothers at public clinics where children are able to access health-care services such as immunisation against diseases such as polio, measles, whooping cough and diphtheria (World Bank 2003). The mothers and their children could make use of the only public sector option available for them. The survey found that nearly a quarter (23.8%) of all children under two years of age visited hospitals and that, on average, there was a total of two visitations to hospitals per year.

Generally, the perceived health status of children older than two years of age was reported to be either excellent or good. A very low percentage of children was reported to have either fair or poor health. However, the health conditions reported most often among children 2–18 years of age were asthma, allergies and poor vision (80.2%, 48.7% and 40%, respectively). According to the WHO/Inter-agency task team on prevention of HIV infection in pregnant women, mothers and their children (2007), the prevalence of

asthma and allergies among children has become an increasing problem in the last few decades. Studies using the classification of primary care have confirmed that coughing is the commonest complaint in primary care and that respiratory conditions, such as asthma, account for eight of the top ten diagnoses encountered in this setting (Bateman, Feldman, Mash et al. 2009). Asthma has become the most common chronic disease among children and is one of the major causes of hospitalisation among children younger than 15 years of age. Nevertheless, the prevalence of asthma has not been estimated reliably for the whole of South Africa, but it is reported as the eighth leading contributor to the burden of diseases in South Africa (Bradshaw, Groenewald, Laubscher et al. 2003).

4.5 National HIV prevalence

Table 4.13 shows the prevalence of HIV in children for different age groups. Overall HIV prevalence among children aged 18 years and younger who participated in this survey was 2.9%. The HIV prevalence among the various age strata was 3.3% for children 0–4 years of age, 2.5% for those 5–11 years of age, 1.1% for teenagers 12–14 years of age,

Table 4.13: HIV prevalence among children by age groups, South Africa 2008

Age (years)	n	HIV (%) [95% CI]
0–4	1 552	3.3 [2.1–5.2]
5–11	1 708	2.5 [1.7–3.7]
12–14	964	1.1 [0.5–2.4]
15–18	1 551	4.5 [2.8–7.2]
Total 0–18	5 745	2.9 [2.2–3.7]

Table 4.14: HIV prevalence among children (0–18 years of age) by demographic characteristics, South Africa 2008

Sex	n	HIV + (%) [95% CI]
Male	2 862	2.9 [1.9–4.4]
Female	2 883	2.8 [2.2–3.7]
Location type		
Urban formal	3 196	2.7 [1.7–4.2]
Urban informal	727	4.5 [3.2–6.4]
Rural informal	1 491	2.8 [1.9–4.1]
Rural formal	331	1.9 [0.8–4.5]
Province		
Western Cape	895	0.9 [0.4–2.3]
Eastern Cape	864	2.5 [1.4–4.5]
Northern Cape	506	1.9 [0.8–4.5]
Free State	342	3.1 [1.3–7.2]
KwaZulu–Natal	854	3.4 [1.9–6.0]
North West	493	2.6 [1.2–5.4]
Gauteng	804	3.1 [1.5–6.0]
Mpumalanga	444	4.5 [2.5–8.0]
Limpopo	543	2.7 [1.6–4.7]

and 4.5% for adolescents 15–18 years of age. The prevalence among children under two years of age was 2.1% (95% CI: 1.2–3.6). The age-specific HIV-prevalence levels are the result of vertical transmission (from mother to child), where the prevalence is high among children 0–4 years of age, and HIV prevalence declines due to HIV/AIDS-related mortality among those 5–11 and 12–14 years of age.

The prevalence of HIV by key demographic factors is shown in Table 4.14. There were no statistically significant differences in HIV prevalence by sex or geographic location, although the prevalence estimate was lowest in the rural formal areas (1.9%) and highest in the urban informal areas (4.5%). The prevalence of HIV infection varied by province. The lowest prevalence was observed in Western Cape at less than 1%, while low to intermediate HIV prevalence was observed in Northern Cape, Eastern Cape, North West and Limpopo (less than 3%). Provinces with higher HIV prevalence were Gauteng and Free State (both 3.1%), KwaZulu-Natal (3.4%) and Mpumalanga (4.5%).

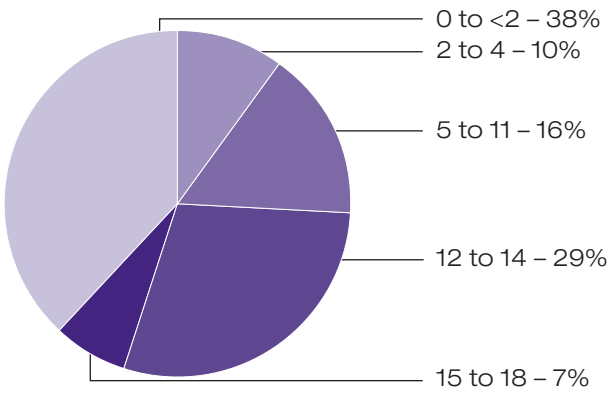
In order to develop interventions, treatment strategies and care programmes, it is crucial to know the distribution of HIV cases. Figure 4.3 presents the distribution of HIV-positive cases by age group. The bulk of HIV infections are in the group of children 15–18 years of age; the second largest group is children 5–11 years of age, followed by those 2–4 years of age. A considerable burden of infections was observed among children under five years of age (26%).

4.5.1 Scarification

Traditional body scarification, which is customary in some ethnic groups globally, involves exposure to blood and is thus a potential risk for the transmission of HIV to both practitioners and their clients. Scarification is done to treat certain childhood conditions, for cultural identification or for beautification.

Scarification is carried out for treating a variety of childhood conditions that are believed to be a result of supernatural forces. In the context of this study, scarification refers to a traditional practice where children are scarred using a razor blade and blood is usually mixed with African medicine either to prevent them from being bewitched or becoming sick, or to make them stronger. Although considered a risk factor for HIV infection, empirical evidence in support of this is scarce to find. Only one recent study could be found. It is from Zimbabwe and suggests a relationship between scarification and HIV infection (Montano, Kasprzyk, Tshimanga et al. 2009).

Figure 4.3: Distribution of HIV-positive cases by age group (0–18 years of age), South Africa 2008



In the Zimbabwe study, respondents were asked if the child had been scarified on any part of the body. The prevalence of scarification among infants under two years of age was 10.9% (95% CI: 8.8–13.4) and no differences were found between males (11.0%, [95% CI: 8.2–14.6]) and females (10.8%, [95% CI: 7.9–14.7]). When the association between scarification and HIV infection was investigated, it was found that there was no significant association between HIV and scarification even though those who had been scarified had a slightly higher prevalence (2.1%, [95% CI: 0.5–8.6]) than those who had not been scarified (1.7%, [95% CI: 0.9–3.5]).

4.5.2 Male circumcision

Male circumcision, which includes both traditional circumcision and medical circumcision, is practised widely in South Africa. Male circumcision is a common traditional practice among several African ethnic groups and a religious tradition among Muslims and Jews in South Africa (see Connolly, Simbayi, Shanmugam et al. 2008). Traditional male circumcision among Africans tends to be performed as part of initiation rites that signal the passage into manhood for young men. Therefore, traditional circumcision tends to be performed at older ages than medical or religious circumcision (Connolly et al. 2008).

Randomised control trials have shown that male circumcision may decrease the risk of HIV infection by as much as 50% (Auvert, Taljaard, Lagarde et al. 2005; Bailey, Moses, Parker et al. 2007; Gray, Kigozi, Serwadda et al. 2007). Both WHO and UNAIDS have been promoting male circumcision as an HIV-prevention intervention. It is estimated that the widespread roll-out of male circumcision in South Africa may prevent two million HIV infections and 300 000 deaths over a 10-year period (Williams, Lloyd-Smith, Gouws et al. 2006). The positive effects of such an intervention may, however, be countered by behavioural changes resulting from perceived decreased risk and consequent increased risk-taking by circumcised men.

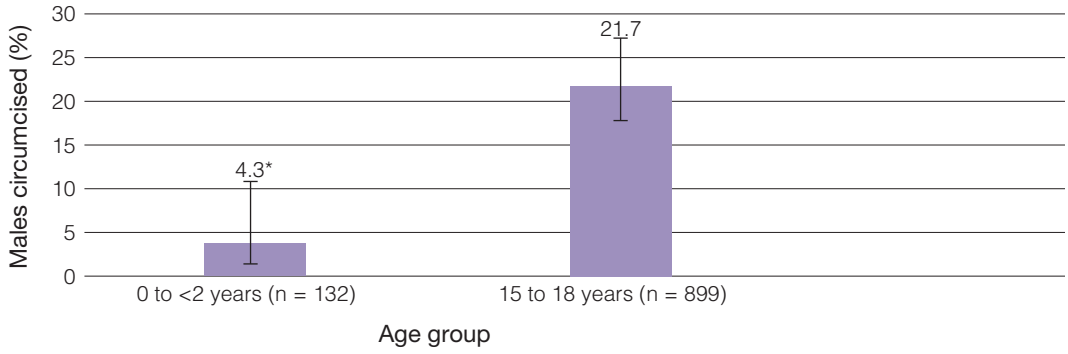
In this survey, parents/guardians of children less than two years of age responded on their male children's behalf to a number of questions on circumcision. These questions included whether the males had been circumcised, reasons for circumcision and who performed the circumcision. Male respondents 15–18 years of age also answered questions on male circumcision. These questions included whether the males had been circumcised and if so, where the circumcision was performed, who performed the circumcision, the age at which the procedure was performed and whether complications were experienced. Males 15–18 years of age who had not been circumcised were asked whether they would consider being circumcised. Females aged 15–18 years of age were asked whether their current sexual partner was circumcised and if not, whether they would be supportive of them being circumcised. Both males and females 15–18 years of age were also asked whether they were aware that circumcision reduced the risk of HIV infection among males and whether they supported the idea that all men should be circumcised. These data are described below.

The proportion of children younger than two years of age who were circumcised was significantly lower than for males 15–18 years of age (see Figure 4.4).

Of the 663 uncircumcised males 15–18 years of age, 48.1% (95% CI: 42.4–54.0) said they would consider being circumcised. Of 768 females 15–18 years of age, 57.9% (95% CI: 53.1–62.6) said they would be supportive if an uncircumcised partner wanted to be circumcised.

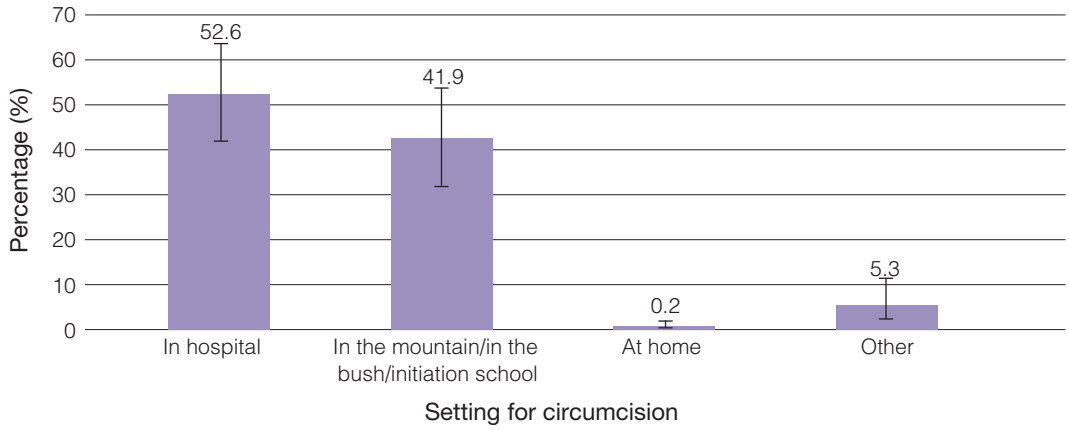
The data shown in Figure 4.5 demonstrate that a slight majority (52.6%) of circumcisions for young males are performed in hospitals.

Figure 4.4: Proportion of males circumcised by age group, South Africa 2008



*Note: * Only eight babies younger than two years of age had been circumcised; given this small sample, these data need to be interpreted with caution.*

Figure 4.5: Setting for circumcision of males 15–18 years of age, South Africa 2008



The reasons for undergoing male circumcision are shown in Figure 4.6. Male circumcision for traditional reasons still predominates, although there is an indication that this proportion has declined for younger males (just over 40%) compared with males 19 years of age and

Figure 4.6: The distribution of reasons for male circumcision 15–18 years of age, South Africa 2008

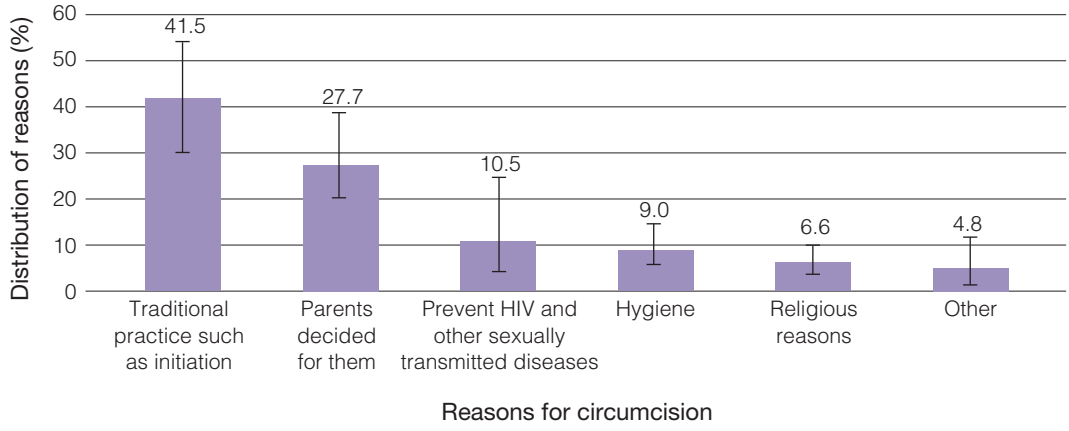
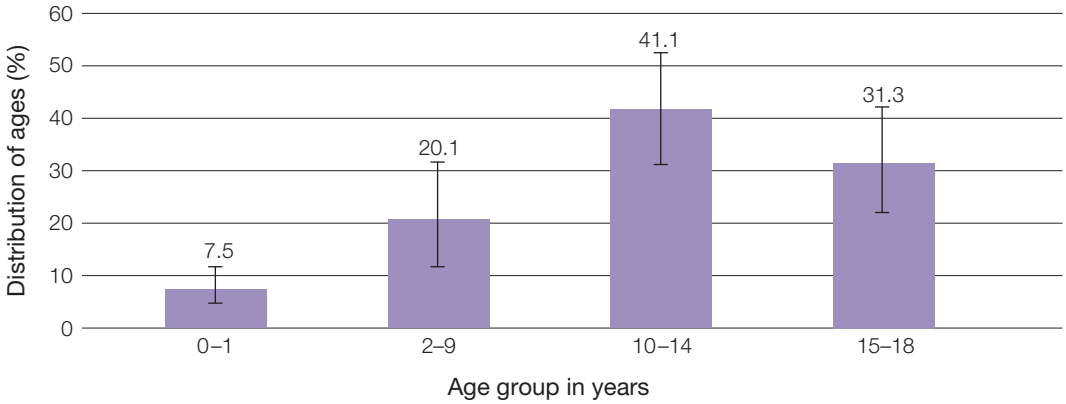


Figure 4.7: The distribution of ages at which circumcision was performed



older (more than 60%). The proportion of young males who report being circumcised to prevent HIV and other sexually transmitted infections was approximately 10%. It was higher than for men who were older (approximately 4%) and who had, on average, been circumcised in the more distant past when knowledge of the protective effect of male circumcision was more limited. This difference was however not statistically significant.

As shown in Figure 4.7, fewer than 10% of circumcised male children were circumcised in the first year of life. Fewer than 30% of circumcised males were circumcised before the age of 10, approximately 40% were circumcised when they were 10–14 years of age. Almost a third (31%) were circumcised after the age of 15 (and before the age of 18); they could, therefore, already have been sexually active.

Of 886 males, those 15–18 years of age, 30.3% (95% CI: 25.8–35.2) were aware that male circumcision has recently been shown to (partly) reduce the risk of HIV infection, and the remainder were unaware of this fact. Most females did not answer the question about the awareness of the protective role of circumcision and hence this data was missed.

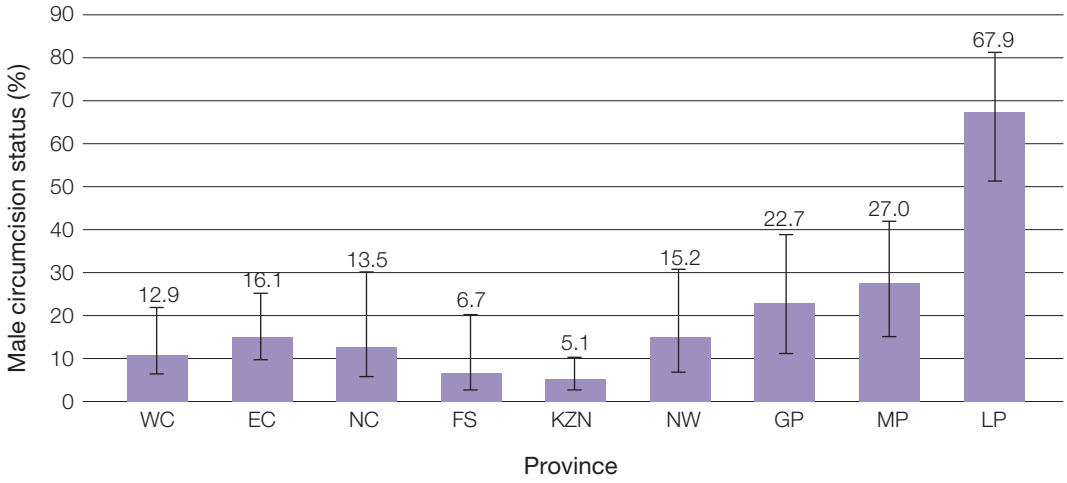
Only half of the respondents (50.3%) in this survey indicated some support for the notion that all men should be circumcised, and there was no difference between the two sexes (see Table 4.15). However, nearly a third of the respondents (30.7%) were opposed to the idea while nearly a fifth (19.1%) were undecided.

The results also further showed that among those 15–18 years of age, the risk of HIV infection was significantly higher (4.5%, [95% CI: 1.5–13.3]) among those who were not circumcised compared to those who were circumcised (0.5%, [95% CI: 0.1–3.1]).

Table 4.15: The proportion of respondents who support the idea that all men should be circumcised, South Africa 2008

Response	Total (15–18) n = 1 773 (%) [95% CI]	Males (15–18) n = 884 (%) [95% CI]	Females (15–18) n = 889 (%) [95% CI]
Support	50.3 [46.0–53.7]	51.0 [45.9–56.1]	49.5 [44.8–54.2]
Oppose	30.7 [27.6–33.9]	34.2 [29.2–39.6]	27.2 [23.4–31.3]
Undecided	19.1 [16.4–22.1]	14.8 [11.3–19.1]	23.3 [19.9–27.2]

Figure 4.8: The distribution of males 15–18 years of age according to province and circumcision status, South Africa 2008



Note: WC = Western Cape; EC = Eastern Cape; NC = Northern Cape; FS = Free State; KZN = KwaZulu-Natal; NW = North West; GP = Gauteng; MP = Mpumalanga; LP = Limpopo

An analysis of the distribution of circumcised males according to province of residence is shown in Figure 4.8. The figure shows that a majority of the males 15–18 years of age from Limpopo Province were circumcised compared to their counterparts from the other provinces.

4.5.3 Discussion

The results of the survey show varying degrees of HIV prevalence by age group. Only 2.1% of children under two years of age were HIV positive. The apparent low HIV infection among children under two years of age is probably a reflection of recent advances in PMTCT programmes.

The high HIV prevalence in informal settlements suggests that the mainly migratory nature of the population (their mothers) put children at risk of HIV infection. Urban informal areas are poor socio-economic areas and this increases the risk of intergenerational sex, sexual violence and unprotected sex.

Children under two years of age were included for the first time in the 2008 household survey, thus a comparison of HIV prevalence can only be made among those 2–18 years of age for the series of household surveys conducted by the HSRC in 2002, 2005 and 2008. Compared to the 2002 household survey (Brookes, Shisana & Richter 2004), the 2008 household survey found a lower HIV prevalence at 5.4% (95% CI: 4.1–7.1) in 2002 as opposed to 3.0% (95% CI: 2.3–3.8) in 2008 among children 2–18 years of age. However, there was no significant difference in HIV prevalence among those 2–18 years of age when comparing the 2005 household survey with the 2008 household survey, 3.5% (95% CI: 2.7–4.6) as opposed to 3.0% (95% CI: 2.3–3.8). This might show that the PMTCT programme has had an effect in reducing infections among children.

The finding that the mainly cultural practice of scarification is not common, particularly among infants, is surprising. We are not aware of a similar study in this age group in this country with which to compare this finding. As with traditional male circumcision, it is possible that the practice increases with age. However, this needs further investigation.

The finding that the mainly cultural practice of males being circumcised increases with age is consistent with the findings of the 2002 survey reported by Connolly, Simbayi, Shanmugam and Nqeketo (2008). They found that the median age of male circumcision for African males was 18 years, compared to 10 years for coloured males, two years for white males and one year for Indian males. More importantly, the overwhelming majority (90.5%) of Venda who had been circumcised were circumcised before 17 years of age, whilst 89% of Xhosa males were circumcised after their 17th birthday. As Connolly et al. (2008) also noted, if male circumcision is to be most beneficial, it should be done before puberty, as among the Venda, or within the first two years of life, as practised by both Muslims and Jews, as the window of opportunity for HIV prevention might be missed if circumcision is done after sexual debut, particularly after 18 years of age.

The level of knowledge about the benefits of male circumcision, particularly in terms of HIV prevention found in this study, was low. In addition, the levels of acceptability of male circumcision found in the present study were lower than those found in a recent review of 13 studies that were carried out in nine southern African countries (Westercamp & Bailey 2007). They found a median of 65% (range 29%–87%) of uncircumcised men were willing to be circumcised, 69% (95% CI: 47–79) of women were in favour of the circumcision of their partners, and 71% (95% CI: 50–90) of men and 81% (95% CI: 70–90) of women were also willing to let their sons be circumcised. This difference reflects the limited age range used in this study wherein the views of only those 15–18 years of age were solicited, whilst views of those 15 years of age and older were mainly solicited in the studies that were reviewed by Westercamp and Bailey. The review included a study by Scott, Weiss and Viljoen (2005) who investigated the acceptability of male circumcision as an HIV intervention in the rural Zulu population in KwaZulu-Natal. Both the review and the findings of Scott et al. (2005) suggest the need for strong advocacy around the issue of male circumcision, particularly as part of a comprehensive male sexual and reproductive health package that includes HIV prevention. This is particularly needed in provinces such as KwaZulu-Natal where male circumcision is not practised traditionally as much as is done by ethnic groups such as the Venda, Sotho, Ndebele and Xhosa. Therefore, the decision by King Goodwill Zwelithini (announced on 4 December 2009) to lift the ban on traditional male circumcision, which lasted for more than two centuries, in favour of medical male circumcision as a new strategy for the prevention of HIV among his male subjects as part of the fight against HIV/AIDS in the province is most welcome indeed. In particular, its timing is perfect as South Africa moves towards scaling up the implementation of the intervention as part of the National Strategic Plan.

4.6 Behavioural determinants of HIV infection

Heterosexual transmission is the most common mode of HIV transmission in South Africa, particularly among sexually active youth and adults. Apart from low levels of male circumcision, sex with multiple and concurrent partners in the context of poor and inconsistent male condom usage have been identified as key drivers of HIV infection in southern Africa, including South Africa (SADC 2006; Hargreaves, Bonell, Morison et al. 2007). In addition, intergenerational sex was also identified as a major contributing driver (SADC 2006; Leclerc-Madlala 2008). In this section, research findings are presented on sexual experience and multiple sexual partners only as key risk factors believed to drive the HIV epidemic. This section should be read in conjunction with the findings on sexual debut among youth by 15 years of age and condom use by youth 15–24 years of age that were presented in detail in the first report from this same survey (Shisana, Rehle, Simbayi et al. 2009).

4.6.1 Sexual behaviour

Table 4.16 shows the prevalence of sexual behaviour among respondents during the 12 months prior to the study. The results show that among children 12–14 years of age, 10.8% of males and 14.5% of females were sexually active in the year prior to the study. The differences, although substantive, were not statistically significant. The level of sexual activity was higher in the group 15–18 years of age than for those 12–14 years of age, as expected, with females (26.6%) more sexually active compared with the males (19.4%), although the difference was not statistically significant. In addition, the levels of secondary abstinence (that is, those who had had sex, but not in the 12 months prior to the study) in both age groups were found to be low (both below 10%) and these levels did not differ by sex.

HIV risk for young people increases if a sexual partner is older as this exposes younger people to a higher level prevalence pool. Figure 4.9 presents findings on the age of a partner and the age of a young person by the sex of the young person. Nearly all males 12–18 years of age had sex with their peers, while slightly more than a quarter of females in the same age group (26.4%) had sex with males who were five years or more older than themselves. However, some caution is urged in interpreting these findings given the small number of children who were sexually active.

Table 4.16: Sexual behaviour among respondents 12–14 and 15–18 years of age during the 12 months prior to the study, South Africa 2008

Sex	Sexual history	12–14 years of age		15–18 years of age	
		n	% [95% CI]	n	% [95% CI]
Males	Reported not sexually active	1 219	84.1 [81.1–86.8]	637	71.3 [66.4–75.7]
	Secondary abstinence	85	5.1 [3.6–7.1]	84	9.3 [6.7–12.9]
	Sexually active in the 12 months prior to the study	162	10.8 [8.6–13.5]	160	19.4 [15.5–24.0]
Females	Reported not sexually active	1 237	81.4 [78.5–84.0]	604	65.3 [60.6–69–8]
	Secondary abstinence	63	4.1 [2.9–5.6]	63	7.7 [5.6–10.5]
	Sexually active in the 12 months prior to the study	222	14.5 [12.3–17.1]	214	26.6 [23.0–31.0]

Figure 4.9: Age difference between youth and sexual partner by sex of respondent in the group 12–18 years of age, South Africa 2008

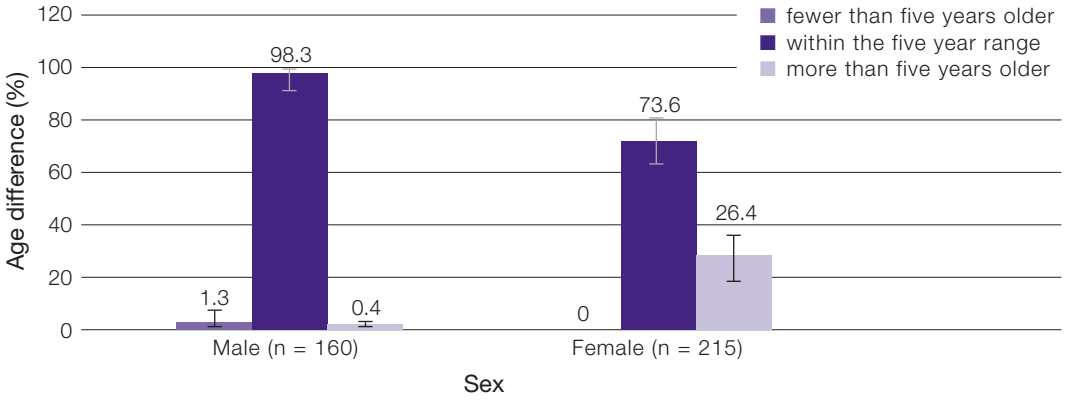
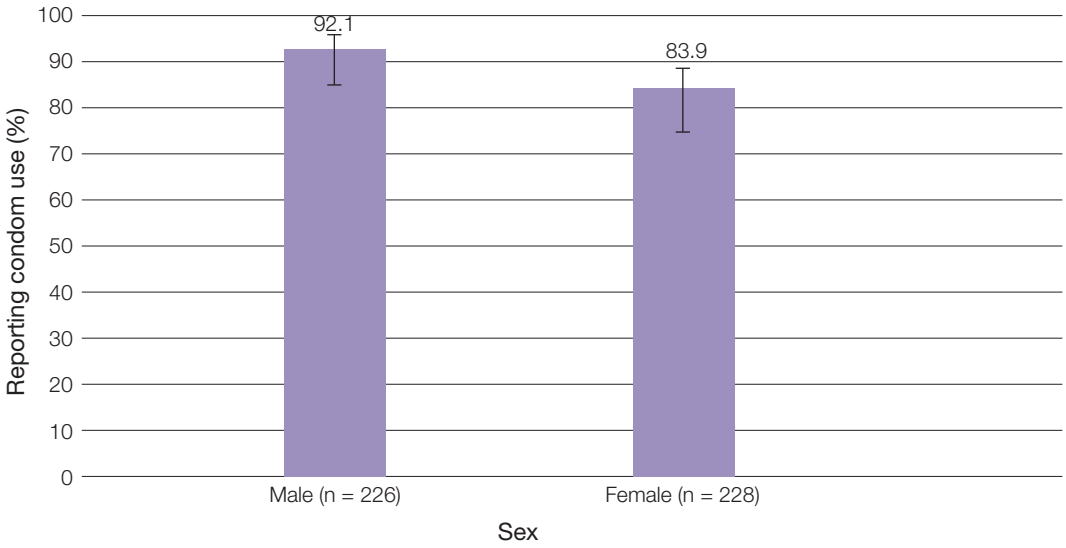


Figure 4.10: Proportion of males and females reporting condom use at last sexual act in the 12 months prior to the study in the group 12–18 years of age, South Africa 2008

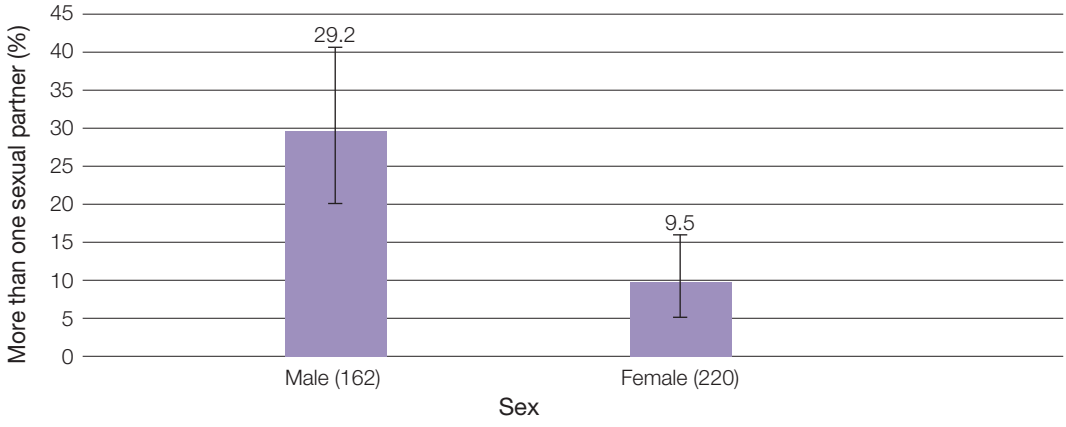


Correct and consistent condom use serves as a very effective barrier to HIV infection. In this study, condom use during the last sexual act in the last year among children 12–18 years of age was measured. The overwhelming majority of males and, to a lesser extent females, used a condom (Figure 4.10).

4.6.2 Multiple sexual partnerships

Multiple sexual partnerships, whether concurrent or serial, particularly those involving high-partner turnover, are known to substantially increase the likelihood of HIV transmission within a sexual network, particularly if the infection is a new one due to high viral load. Although only based on 162 males and 220 females who were sexually active in the group 15–18 years of age (see Figure 4.11), more males (29.2%, [95% CI: 20.0–40.5]) reported having had more than two sexual partners in the 12 months prior to the study than did females (9.5% [95%, CI: 5.4–16.2]). The difference between the two groups was statistically significant.

Figure 4.11: Proportion of males and females reporting more than one sexual partner in the 12 months prior to the study in the group 12–18 years of age, South Africa 2008



4.6.3 Discussion

The results show that among children 12–14 years of age, 10.8% of males and 14.5% of females were sexually active in the year prior to the study. Sexual activity was also higher among females 15–18 years of age as compared to males in the same age group, although the difference was not statistically significant.

The finding that young females tend to have sex with partners five years older, and even much older, than themselves is of serious concern. At too early an age, young females were already having sex with partners in the age group with higher HIV prevalence. This increases the young females' chances of contracting HIV should all their sex acts be unprotected. Most of the young males in this study tended to have sex with partners in their own age groups, which is likely to protect them from the risk of HIV infection. However, males compared to females were significantly more likely to have multiple sexual partners, but with reported condom use at rates of more than 90%, they are likely to remain HIV negative, provided that their use of condoms is correct and consistent.

Although males appear to be heeding the message about using condoms for HIV prevention, there is still a need to reinforce the need for abstinence for those who are not sexually active, and to encourage the reduction of the number of sexual partners among those who are sexually active.

4.7 Communication

4.7.1 Media sources for HIV/AIDS information

In South Africa, a wide range of communication media include HIV/AIDS content. This includes news coverage and feature programming and articles, as well as the content of AIDS campaigns.

Table 4.17 shows media sources that were found useful for improving the understanding of HIV/AIDS. The majority of children 12–14 and 15–18 years of age were exposed to communication about HIV/AIDS that was perceived to be useful. Television and radio were the most prominent media sources for those 12–14 years of age, whilst for those 15–18 years of age, television and posters were most prominent. Newspapers and magazines were mentioned least often by both age groups.

Data on language is only presented for teenagers in the group 15–18 years of age. In this group, television was most likely to be mentioned in all home-language categories, followed by radio. Afrikaans and Tshivenda home-language speakers had lower mention across the range of communication channels in comparison to other language groups, with newspapers, magazines and leaflets mentioned least often.

4.7.2 Awareness of national AIDS communication programmes

AIDS communication programmes in South Africa at national level include the government's Khomanani Campaign, NGO-led national programmes such as Soul City, Soul Buddyz and loveLife. The four main national programmes involve campaigns that run for a few years and have large budgets and activities that include mass media, small media

Table 4.17: Media sources found to be useful for improving the understanding of HIV/AIDS in the year prior to the study by respondents aged 15–18 years

Variable	Radio (%) [95% CI]	Television (%) [95% CI]	Newspaper (%) [95% CI]	Leaflets/ booklets (%) [95% CI]	Magazine (%) [95% CI]	Posters (%) [95% CI]	Signs or billboards (%) [95% CI]
Age							
12–14	78.3 [74.0–82.0]	88.9 [85.8–91.4]	70.0 [64.6–75.0]	74.5 [69.5–78.9]	64.8 [59.5–69.8]	76.0 [71.2–80.3]	72.2 [67.3–76.6]
15–18	82.1 [79.2–84.7]	90.6 [88.4–92.4]	75.4 [71.6–78.8]	79.4 [76.0–82.5]	74.7 [71.0–78.1]	82.8 [79.8–85.4]	78.3 [75.0–81.3]
Total	80.4 [77.8–82.9]	89.8 [87.9–91.5]	73.2 [69.8–76.4]	77.2 [74.2–80.0]	70.5 [67.3–73.5]	79.8 [76.9–82.4]	75.6 [72.6–78.4]
Language							
English	61.3 [51.0–70.8]	81.4 [73.0–87.7]	76.2 [66.0–84.0]	79.6 [72.0–85.5]	67.7 [59.3–75.1]	82.8 [76.0–88.1]	72.5 [64.9–79.0]
Afrikaans	52.0 [45.0–58.9]	82.9 [76.6–87.8]	58.2 [50.8–65.1]	64.9 [57.9–71.4]	58.2 [51.3–64.7]	69.9 [63.4–75.7]	63.1 [56.5–69.2]
Nguni languages	85.7 [81.7–89.0]	92.4 [89.7–94.5]	75.8 [70.5–80.3]	80.2 [75.0–84.6]	72.9 [67.5–77.7]	82.5 [77.7–86.5]	78.5 [73.5–82.7]
Sotho languages	85.3 [80.8–88.8]	90.3 [86.7–93.1]	76.4 [70.5–81.4]	79.8 [75.0–83.9]	73.7 [68.3–78.4]	81.5 [76.0–85.9]	78.4 [73.2–82.9]
Tshivenda	79.4 [54.3–92.6]	93.8 [74.1–98.8]	49.0 [20.9–77.6]	55.0 [38.0–70.8]	57.4 [80.1–80.7]	61.4 [42.9–77.1]	65.3 [46.4–80.3]
Xitsonga	80.0 [64.4–89.8]	90.3 [75.9–95.7]	63.2 [45.7–77.8]	62.2 [43.7–77.8]	65.9 [49.0–79.5]	67.1 [50.0–80.6]	65.0 [47.6–79.1]
Total	80.4 [77.7–82.9]	89.8 [87.9–91.5]	73.2 [69.8–76.4]	77.1 [74.1–79.9]	70.5 [67.3–73.5]	79.8 [76.9–82.4]	75.6 [72.6–78.3]

such as leaflets and posters, events and interactive activities. Soul Buddyz and loveLife are specifically oriented towards children and adolescents, while Khomanani and Soul City include youth as an intended audience.

The majority of respondents 12–14 and 15–18 years of age were aware of the major national programmes, with the exception of Khomanani in the younger age group, where only half were aware of the programme. Although Soul Buddyz is the only programme that focuses directly on the younger age group (12–14 years of age), it does not uniformly have the highest awareness among younger children. For example, as shown in Table 4.18, loveLife has equivalent awareness in urban formal areas, Soul City has higher reach in both urban informal and rural informal areas, and Soul Buddyz has the lowest awareness in rural formal areas. When considering age group alone, Table 4.18 shows that Soul Buddyz has very similar awareness to Soul City and loveLife in the group 12–14 years of age.

National communication programmes utilise a range of South African languages to reach audiences. Table 4.19 shows awareness of programmes in the year prior to the study by home language spoken by participants. Nguni languages are the most widely spoken home languages, followed by Afrikaans, Sepedi (Northern Sesotho) and English.

Table 4.18: Awareness of national HIV/AIDS programmes in the 12 months prior to the study by locality type and age group

Age group	Campaign/ programme	Locality type (%)				
		n	Urban formal (%) [95% CI]	Urban informal (%) [95% CI]	Rural informal (%) [95% CI]	Rural formal (%) [95% CI]
12–14	Soul City	1 253	73.5 [66.9–79.1]	72.5 [61.3–81.5]	61.7 [54.3–68.6]	57.9 [40.5–73.5]
	Soul Buddyz	1 249	78.4 [73.3–82.8]	64.9 [53.2–75.0]	54.2 [46.9–61.3]	31.0 [18.6–46.9]
	Khomanani	1 249	58.8 [52.5–64.9]	57.8 [46.6–68.3]	37.3 [80.9–44.3]	45.0 [30.8–60.2]
	loveLife	1 249	77.8 [71.4–83.2]	55.6 [44.9–65.8]	52.2 [45.4–58.8]	55.6 [36.2–73.3]
15–18	Soul City	1 808	78.4 [74.2–82.2]	84.5 [76.1–90.3]	72.2 [66.3–77.5]	61.3 [47.9–73.2]
	Soul Buddyz	1 804	75.3 [70.2–79.8]	77.7 [70.5–83.5]	56.8 [49.9–63.5]	45.1 [32.4–58.5]
	Khomanani	1 804	73.2 [68.8–77.3]	75.9 [68.3–82.2]	54.8 [48.6–60.9]	47.6 [36.3–59.1]
	loveLife	1 805	86.3 [81.9–89.8]	84.2 [76.7–89.5]	66.7 [60.9–71.9]	69.3 [55.8–80.1]
Total 12–18	Soul City	3 061	76.1 [71.7–80.0]	79.0 [72.9–84.0]	67.5 [62.5–72.2]	59.8 [48.3–70.3]
	Soul Buddyz	3 053	76.8 [72.7–80.4]	71.7 [64.7–77.8]	55.7 [50.0–61.1]	38.9 [29.8–48.7]
	Khomanani	3 053	66.4 [62.2–70.4]	67.5 [60.5–73.8]	47.0 [42.1–51.9]	46.5 [36.9–56.3]
	loveLife	3 054	82.3 [77.9–86.0]	70.9 [63.9–77.1]	60.2 [55.3–64.9]	63.2 [52.0–73.1]

Sesotho speakers had higher overall awareness of programmes compared with other home-language speakers, while English and Afrikaans speakers had considerably lower awareness. Fewer than half of English and Afrikaans speakers were aware of Soul City or Khomanani. LoveLife had markedly higher reach among English and Afrikaans home-language speakers compared to the other programmes.

Table 4.20 shows awareness of the national programmes by race. Among adolescents 12–14 and 15–18 years of age, awareness was very low among white youth. Among adolescents 12–14 years of age, only 8.9% mentioned Soul City, 9.5% mentioned Khomanani and 15.4% mentioned Soul Buddyz. Awareness of loveLife was considerably higher at 42.1%. Among males and females in the group 15–18 years of age, there was a similar pattern of low awareness among white youth. Overall, in the group 12–18 years of age, more than three-quarters of white children were not aware of even one of the four programmes. Soul City (15.8%) and Soul Buddyz (19.8%) achieved lower awareness than Khomanani (22.0%), with loveLife as the only exception with a very high awareness at 55.6%.

Table 4.19: Awareness of national HIV/AIDS programmes/campaigns by home language in the 12 months prior to the study in the group 12–18 years of age

Campaign/ Programme	n	Languages (%)					
		English (%) [95% CI]	Afrikaans (%) [95% CI]	Nguni (%) [95% CI]	Sesotho (%) [95% CI]	Tshivenda (%) [95% CI]	Xitsonga (%) [95% CI]
Soul City	3 046	42.4 [33.1–52.3]	45.6 [39.0–2.3]	77.9 [73.5–1.8]	80.1 [74.8–4.6]	55.9 [37.6–2.8]	73.6 [57.485.2]
Soul Buddyz	3 038	53.8 [45.2–62.2]	52.3 [45.5–9.0]	65.1 [59.8–0.1]	79.7 [74.7–4.0]	48.0 [30.2–6.3]	59.1 [44.172.6]
Khomanani	3 038	41.3 [33.3–49.7]	39.2 [33.5–5.3]	59.9 [55.0–4.6]	66.1 [60.6–1.2]	46.3 [28.9–4.7]	62.0 [50.172.6]
loveLife	3 039	74.8 [66.4–81.6]	74.2 [68.1–9.5]	67.8 [63.0–2.2]	80.3 [75.3–4.5]	51.3 [33.2–9.0]	67.2 [51.479.9]

Table 4.20: Awareness of HIV/AIDS programmes/campaigns in the year prior to the study by race and age group

Age group	Campaign/ Programme	Race				
		n	African (%) [95% CI]	White (%) [95% CI]	Coloured (%) [95% CI]	Indian (%) [95% CI]
12–14	Soul City	1 253	74.0 [69.1–78.4]	8.9 [4.2–18.0]	53.0 [43.8–62.0]	60.1 [32.5–82.4]
	Soul Buddyz	1 249	69.3 [64.6–3.7]	15.4 [8.3–27.0]	74.6 [65.4–82.0]	71.6 [48.5–87.0]
	Khomanani	1 249	53.5 [48.5–8.5]	9.5 [4.4–19.2]	47.1 [38.4–55.9]	41.6 [31.9–52.1]
	loveLife	1 249	65.8 [60.8–0.6]	42.1 [30.7–54.5]	82.0 [74.7–87.5]	73.5 [47.4–89.5]
15–18	Soul City	1 808	80.9 [77.4–3.9]	21.8 [12.1–36.0]	69.5 [60.3–77.5]	51.3 [42.5–60.0]
	Soul Buddyz	1 804	69.5 [65.0–3.7]	23.5 [14.8–35.3]	75.9 [66.8–83.2]	58.3 [47.6–68.3]
	Khomanani	1 804	68.9 [64.8–2.7]	32.6 [20.8–47.1]	52.3 [44.2–60.3]	56.9 [39.7–72.6]
	loveLife	1 805	77.1 [73.3–0.5]	67.1 [53.4–78.4]	90.8 [86.4–93.9]	83.3 [77.4–87.9]
Total 12–18	Soul City	3 061	77.7 [74.4–80.7]	15.8 [9.6–24.9]	62.6 [54.9–69.7]	55.3 [42.8–67.1]
	Soul Buddyz	3 053	69.4 [65.6–73.0]	19.8 [13.3–28.4]	75.4 [69.1–80.7]	64.4 [56.4–71.6]
	Khomanani	3 053	61.7 [58.2–65.2]	22.0 [14.4–32.0]	50.1 [44.1–56.1]	49.9 [39.6–60.3]
	loveLife	3 054	71.9 [68.4–75.1]	55.6 [45.8–65.0]	87.1 [83.0–90.3]	78.8 [66.7–87.4]

Table 4.21: Source providing personally useful information about HIV/AIDS in the year prior to the study by age

Source	Age group (years)		
	n	12–14 (%) [95% CI]	15–18 (%) [95% CI]
Friend(s)	3 019	47.5 [43.4–51.6]	65.7 [62.5–68.8]
Health facility (clinic/hospital/doctor)	3 017	41.0 [36.7–45.4]	58.3 [54.9–61.6]
Religious institution/faith-based organisation (FBO)	3 018	23.4 [19.9–27.2]	31.7 [28.4–35.2]
Parent or caregiver	3 017	53.1 [49.0–57.1]	58.4 [54.9–61.8]
Community meeting	3 009	7.5 [5.6–10.2]	11.2 [9.4–13.3]
AIDS or welfare organisation	3 005	8.4 [6.4–11.0]	15.7 [13.2–18.5]
Pharmacy	3 002	9.0 [6.7–12.1]	11.3 [9.2–13.7]
Traditional healer	3 003	2.3 [1.1–4.7]	2.4 [1.5–3.9]
Telephone helpline	3 003	4.1 [2.7–6.0]	5.8 [4.5–7.5]

Table 4.21 shows sources of information about HIV/AIDS that were useful to youth in the year prior to the study. Parents or caregivers were most likely to be mentioned by teenagers 12–14 years of age, followed by friends and health workers, with other sources achieving low mention – the least being traditional healers and telephone helplines. Among those 15–18 years of age, friends had the highest mention, followed by parents or caregivers, and health workers. Traditional healers and telephone helplines were also mentioned least often in this age group.

Table 4.22 shows HIV/AIDS activities engaged in during the year prior to the study. Participation was low overall with the exception of attending an AIDS play or an educational event, which was four or more times more likely to be mentioned than any of the other categories. A small, but not insignificant proportion of teenagers mentioned engaging with HIV/AIDS in home environments, with 6.3% mentioning helping someone in the family who had lost a family member as a result of AIDS and 6.0% mentioning caring for a person who was sick with AIDS.

Table 4.22: HIV/AIDS-related activities attended or participated in in the year prior to the study in the group 12–18 years of age

Activity	n	Yes (%) [95% CI]
Attended an AIDS play or educational event	3 056	22.5 [20.2–25.0]
Community meetings	3 052	4.0 [3.1–5.2]
Helped someone in the family who has lost a family member as a result of AIDS	3 037	6.3 [5.1–7.9]
Helped a family member who cares for someone who is sick with AIDS	3 051	5.3 [4.2–6.6]
Attended a workshop on HIV/AIDS	3 049	5.4 [4.4–6.6]
Attended a local AIDS rally, march or event	3 052	5.6 [4.5–7.0]
Cared for a person who is sick with AIDS	3 051	6.0 [4.7–7.6]
Volunteered for HIV/AIDS activities	3 052	4.2 [3.2–5.6]
Has membership of an HIV/AIDS organisation	3 054	1.9 [1.4–2.7]
Attended a 46664 event	3 039	2.4 [1.6–3.5]

Table 4.23: Communication between parent/caregivers and children 5–11 years of age about sex, sexual abuse and HIV/AIDS

Issue concerned	n	Yes (%) [95% CI]
Have you ever discussed sex with this child?		
Male	1 934	9.3 [7.5–11.5]
Female	1 840	16.1 [13.6–18.9]
Total	3 774	12.7 [11.1–14.4]
Have you ever discussed sexual abuse with this child?		
Male	212	87.9 [79.0–93.4]
Female	302	93.8 [88.9–96.6]
Total	514	91.6 [87.4–94.5]
Have you ever discussed with this child how HIV/AIDS is transmitted?		
Male	1 920	13.5 [11.2–16.2]
Female	1 828	18.6 [15.9–21.6]
Total	3 748	16.0 [14.2–18.0]
Have you ever discussed with this child how to prevent HIV/AIDS?		
Male	1 929	13.4 [11.1–16.0]
Female	1 830	15.7 [13.1–18.6]
Total	3 759	14.5 [12.7–16.5]

4.7.3 Communication and knowledge about HIV/AIDS-related issues

Table 4.23 shows communication about sex, sexual abuse, how HIV is transmitted and prevention between parent/caregivers and children 5–11 years of age. There was very low overall communication about sex by caregivers with children in this age group, although discussion is more likely to occur with females. Sexual abuse, however, was not overlooked, and was discussed with the majority of children in this age group. HIV transmission and HIV prevention were also not discussed much with most children.

Table 4.24 shows communication about sex and sexual abuse between parent/caregivers and teenagers 12–14 years of age. Sex was more likely to have been discussed with female children than male children, as was the case with sexual abuse. While a higher proportion of parent/caregivers spoke to children about sexual abuse, such discussion was less likely among males, and the differences are significant. Furthermore, only half of the parent/guardians had spoken to children in this age group about sexual abuse.

Table 4.24: Communication between parent/caregivers and teenagers 12–14 years of age about sex and sexual abuse

Issues concerned	n	Yes (%) [95% CI]
Has a parent/guardian ever talked to you about sex?		
Male	597	35.2 [29.6–41.2]
Female	640	50.1 [44.1–56.0]
Total	1 237	42.6 [38.4–46.8]
Has a parent/guardian ever talked to you about sexual abuse?		
Male	588	42.0 [35.8–48.5]
Female	635	59.5 [53.6–65.2]
Total	1 223	50.8 [46.4–55.2]

4.7.4 Discussion

Radio remains a useful medium for accessing children and adolescents across all language groups, while both radio and television have high overall reach. Print media such as magazines, leaflets and newspapers are noted to be useful sources for understanding HIV/AIDS by around two-thirds or more teenagers in the group 12–18 years of age, and this suggests high levels of literacy. The government's Khomanani programme lags behind other national programmes in terms of awareness; this is particularly evident in the group 12–14 years of age, where only half of adolescents are reached.

There is quite poor overall awareness of the national communication programmes among English and Afrikaans home-language speakers. Awareness of the child-oriented Soul Buddyz programme among adolescents 12–14 years of age is lower than programmes focusing on older age groups in urban informal, rural informal and rural formal areas, although these differences are not significant.

There was awareness of loveLife by two-thirds or more across all language groups with the exception of Tshivenda speakers. When race is considered, there is very low overall awareness of the four national programmes among white youth, with only loveLife reaching them to any extent, albeit only reaching just over half of those 12–18 years of age. The vast majority of white children and adolescents are not reached by the three other major programmes.

Friends, parent/caregivers and health facilities are prominent sources of information about HIV/AIDS, while the only community-level activity that has much prominence is attending an AIDS play or an educational event. Although helplines offer interactive communication about HIV, and many are toll-free, there is very little use of this source of information. There was also not much involvement in HIV/AIDS-related activities, with AIDS plays or educational events being mentioned much more often, but only by about one in five respondents. Although about 6% mentioned caring for a person sick with AIDS, or helping a family affected by AIDS, it is worth noting that this translates to a high overall number of children and adolescents who are directly confronting the impacts of the HIV/AIDS epidemic.

It is interesting to note the disparity between discussing sexual abuse with children 5–11 years of age and discussing sex. It would seem to be difficult to discuss sexual abuse without discussing sex, although the findings suggest that this occurs given that over 90% of caregivers report discussing sexual abuse, while just over 10% report discussing sex. The extent of discussion of sexual abuse is surprising, given that the sexual abuse of children is often accompanied by silence and it is consequently hidden as a social issue. Factors that influence the extent to which sexual abuse is discussed may include the increased emphasis on legislation to protect children, for example, the Children's Act (No. 38 of 2005), Domestic Violence Act (No. 116 of 1998) and the Prevention of Family Violence Act (No. 133 of 1993), in conjunction with media attention that is given to the issue.

The low level of discussion about sex with youth 5–11 years of age included low levels of discussion about HIV transmission. While caregivers may be reluctant to discuss sex with children of such a young age, there are discussions about HIV transmission that are important and do not entail sex – for example, how to prevent transmission through contact with blood and how to relate to other children who are HIV positive. Adolescents 12–14 years of age were also not recipients of much discussion about

sex and sexual abuse, and it is worth contrasting the perspectives of the caregivers of children 5–11 years of age – most of whom say they speak to children about sexual abuse – and the perspectives of respondents 12–14 years of age. Only about half of the adolescents say that a parent or guardian has spoken to them about child sexual abuse. Notwithstanding this contradiction, it is also worth noting that males are significantly less likely to be the recipients of information about sex, sexual abuse and HIV/AIDS in comparison to females, which suggests that gender influences the relative importance of such discussions.

4.8 Contextual factors

4.8.1 Orphanhood

One of the main impacts of HIV/AIDS is the premature death of young people who leave their children behind without one or both parents. Paternal orphans do not have fathers and maternal orphans do not have mothers. When children lose both parents, they are called double orphans. As it is difficult to trace the cause of death of parents, this analysis focuses on estimating the magnitude of the orphanhood problem in the general population of South Africa in 2008.

Table 4.25 shows estimates of orphanhood by various key demographic characteristics. The overall rate of orphanhood was 16.8%, with the phenomenon being slightly more common among males (17.6%) than females (15.9%). However, the sex differences were not statistically significant. These statistics translate to an estimate of 3 032 000 orphans in the country, 1 601 000 males and 1 431 000 females (Figure 4.12).

Table 4.25 shows that most of the orphans were paternal (10.5%), followed by maternal (3.9%), while the fewest were double orphans (2.3%). The proportion of paternal orphans was significantly higher than both maternal and double orphans. These statistics translate to an estimate of 1 899 000 paternal orphans, 713 000 maternal and 419 000 double orphans (Figure 4.13).

Table 4.25: Estimates of orphanhood by various key demographic characteristics among respondents aged 0–18 years of age

Variable	Level (n)	Orphans (%) [95% CI]	Maternal orphans (%) [95% CI]	Paternal orphans (%) [95% CI]	Double orphans (%) [95% CI]	Non-orphans (%) [95% CI]
Total	8 203	16.8 [15.3–18.3]	3.9 [3.3–4.7]	10.5 [9.4–11.7]	2.3 [1.9–2.9]	83.2 [81.7–84.7]
Gender						
Male	4 146	17.6 [15.7–19.7]	4.9 [3.9–6.3	10.4 [9.0–12.1]	2.3 [1.6–3.2]	82.4 [80.3–84.3]
Female	4 057	15.9 [14.1–17.8]	2.9 [2.2–3.9]	10.6 [9.1–12.2]	2.4 [1.8–3.2]	84.1 [82.2–85.9]
Race						
African	5 271	18.7 [17.1–20.5]	4.4 [3.6–5.3]	11.7 [10.5–13.1]	2.6 [2.1–3.3]	81.3 [79.5–82.9]

continued →

Variable	Level (n)	Orphans (%) [95% CI]	Maternal orphans (%) [95% CI]	Paternal orphans (%) [95% CI]	Double orphans (%) [95% CI]	Non-orphans (%) [95% CI]
White	617	3.2 [1.5–6.9]	1.8 [0.5–6.4]	1.3 [0.6–2.6]	0.2 [0.0–0.7]	96.8 [93.1–98.5]
Coloured	1 588	9.0 [7.2–11.2]	2.0 [1.2–3.2]	5.7 [4.4–7.3]	1.3 [0.5–3.4]	91.0 [88.8–92.8]
Indian	706	4.3 [2.8–6.7]	0.6 [0.3–1.6]	3.6 [2.1–6.1]	0.1 [0.0–1.0]	95.7 [93.3–97.2]
Age						
0–4	2 854	3.3 [2.5–4.3]	0.8 [0.5–1.3]	2.4 [1.8–3.3]	0.1 [0.0–0.2]	96.7 [95.7–97.5]
5–9	1 684	14.2 [11.7–17.2]	3.3 [2.1–5.1]	9.2 [7.4–11.5]	1.7 [1.0–3.0]	85.8 [82.8–88.3]
10–14	1 918	20.9 [18.3–23.7]	4.2 [3.1–5.7]	13.5 [11.4–15.8]	3.2 [2.1–4.8]	79.1 [76.3–81.7]
15–18	1 747	32.7 [29.3–36.2]	8.6 [6.6–11.2]	19.1 [16.5–21.9]	5.0 [3.8–6.5]	67.3 [63.8–70.7]
Province						
Western Cape	1 098	11.0 [8.2–14.6]	4.2 [2.2–7.9]	6.4 [4.9–8.2]	0.4 [0.2–0.9]	89.0 [85.4–91.8]
Eastern Cape	1 157	23.2 [18.9–28.1]	4.5 [3.0–6.7]	17.2 [14.0–20.9]	1.5 [0.8–2.9]	76.8 [71.9–81.1]
Northern Cape	559	10.5 [7.3–14.7]	2.9 [1.5–5.6]	6.0 [3.8–9.3]	1.5 [0.7–3.3]	89.5 [85.3–92.7]
Free State	522	18.2 [14.4–22.7]	2.3 [1.3–4.0]	8.9 [6.9–11.4]	6.9 [4.4–10.7]	81.8 [77.3–85.6]
KwaZulu-Natal	1 563	19.4 [16.2–23.2]	3.5 [2.3–5.3]	13.3 [10.8–16.3]	2.7 [1.5–4.6]	80.6 [76.8–83.8]
North West	678	13.2 [10.0–17.1]	3.2 [1.8–5.4]	7.5 [5.2–10.5]	2.5 [1.2–5.3]	86.8 [82.9–90.0]
Gauteng	1 199	14.2 [10.9–18.3]	5.3 [3.5–7.9]	6.8 [4.9–9.3]	2.1 [1.3–3.4]	85.8 [81.7–89.1]
Mpumalanga	661	15.3 [11.4–20.3]	4.7 [3.0–7.4]	7.2 [5.0–10.4]	3.4 [1.8–6.1]	84.7 [79.7–88.6]
Limpopo	766	16.0 [12.1–20.9]	2.4 [1.3–4.7]	12.0 [8.4–16.9]	1.5 [0.7–3.2]	84.0 [79.1–87.9]
Locality type						
Urban formal	4 668	14.9 [13.0–17.2]	4.1 [3.1–5.5]	8.5 [7.2–10.0]	2.3 [1.7–3.1]	85.1 [82.8–87.0]
Urban informal	980	15.6 [12.2–19.8]	2.8 [2.0–3.9]	10.2 [7.4–14.0]	2.6 [1.4–4.7]	84.4 [80.2–87.8]
Rural informal	2 073	20.0 [17.4–22.8]	3.9 [2.9–5.1]	13.9 [11.8–16.3]	2.2 [1.5–3.3]	80.0 [77.2–82.6]
Rural formal	482	12.5 [8.5–17.9]	5.0 [2.8–8.9]	5.0 [3.2–7.6]	2.5 [0.9–6.6]	87.5 [82.1–91.5]

Figure 4.12: The number and proportion of male and female orphans, South Africa 2008

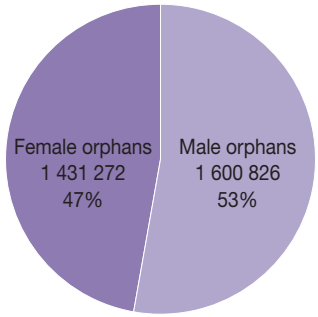


Figure 4.13: The number and proportion of paternal, maternal and double orphans, South Africa 2008

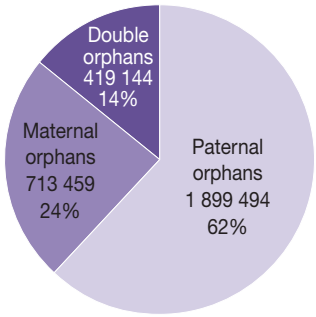


Table 4.25 shows that the proportions of both paternal and double orphans were the same for the two sexes, but there was a significantly higher proportion of male maternal orphans (4.9%) than of female orphans (2.9%). The likelihood of being an orphan increases with age – 32.7% of teenagers 15 to 18 year of age were orphans. By province, Eastern Cape has the highest percentage of orphans, followed by KwaZulu-Natal, whilst Northern Cape and Western Cape have the smallest percentage of orphans. Rural informal areas have the highest burden of orphanhood.

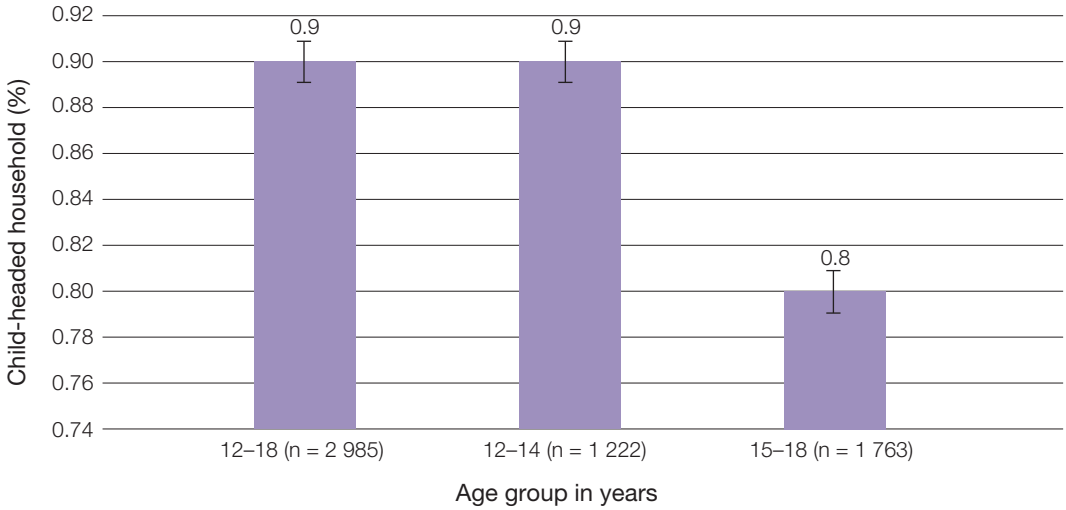
Table 4.26 shows the educational levels among orphans and non-orphans. The results show that 12.9% of the orphans had no schooling at all compared to 29.4% of the non-orphans. When disaggregated by type of orphan, slightly more maternal orphans had no schooling compared to any other type of orphan.

Table 4.26: Proportion of orphans at different educational levels

Variable	Level (n)	Orphans (%) [95% CI]	Maternal orphans (%) [95% CI]	Paternal orphans (%) [95% CI]	Double orphans (%) [95% CI]	Non-orphans (%) [95% CI]
No schooling	1 608	12.9 [10.0–16.5]	17.0 [10.3–26.9]	12.4 [9.0–16.8]	7.7 [3.6–15.9]	29.4 [27.4–31.5]
Up to Standard 1/ Grade 3/ABET* 1	1 377	23.4 [19.2–28.3]	14.4 [9.2–21.8]	26.5 [21.2–32.5]	26.3 [16.0–40.0]	33.6 [31.5–35.8]
Standard 2–3/ Grade4–5/ABET 2	594	15.1 [11.5–19.5]	17.6 [10.2–28.7]	15.0 [10.6–20.9]	10.9 [5.4–20.6]	11.5 [10.2–13.1]
Standard 4–5/ Grade 6–7/ABET 3	249	8.3 [6.1–11.2]	11.3 [7.1–17.4]	6.5 [4.0–10.2]	11.4 [5.4–22.6]	3.5 [2.9–4.2]
Standard 6–7/ Grade 8–9/ABET 4	626	20.0 [16.3–24.2]	25.8 [17.3–36.8]	17.1 [13.0–22.0]	22.3 [14.6–32.5]	9.4 [8.3–10.6]
Standard 8/Grade 10/ NTC** 1/Standard 9/ Grade 11	719	17.8 [14.7–21.3]	11.4 [7.1–17.7]	19.9 [15.7–24.8]	20.0 [12.7–30.0]	10.0 [8.9–11.3]
Standard 10/Grade 12/ Matric/NTC 3	167	2.4 [1.5–3.8]	2.0 [0.7–5.3]	2.7 [1.6–4.6]	1.4 [0.3–7.0]	2.1 [1.5–3.0]
Certificate or diploma with Grade 12	17	0.2 [0.0–0.9]	0.6 [0.1–3.8]	0.1 [0.0–0.4]	0.0	0.4 [0.2–0.7]

*Notes: * ABET – Adult basic education and training*
*** NTC – National Technical Certificate*

Figure 4.14: Child-headed households (12–18 years of age), South Africa 2008



4.8.2 Child-headed households

Figure 4.14 shows the percentage of children 12–18 years of age who reported that they were heads of households. The figure shows that fewer than 1.0% of the children were heads of households. The percentage of children who reported to be the heads of households did not differ in the groups 12–14 and 15–18 years of age. Equally important to note is the fact that of the 26 children who were heads of households, 13 were 18 years old. Thus, child-headed households were not common.

4.8.3 Discussion

The overall level of orphanhood in South Africa among children 18 years or younger is 16.8%. The level of orphanhood among those 2–18 years of age is 19.3% in the 2008 survey. The overall level of orphanhood found in this study for those 2–18 years of age appears to have increased slightly over the seven years prior to the study, as it was 15.6% in 2002 (Brookes, Shisana & Richter 2004) and 14.4% in 2005 (Shisana, Rehle, Simbayi et al. 2005). As this figure includes orphanhood from all causes, it is unlikely to change dramatically. One further complication is that in African culture only a double orphan is considered an orphan, whilst the UNAIDS' definition (UNAIDS, UNICEF and USAID, 2004) includes both paternal and maternal orphans.

As regards teenagers 12–18 years of age who identified themselves as heads of their households, there was a notable decline from 2.6% in 2005 (Shisana, Rehle, Simbayi et al. 2005) to 0.8% in 2008. This was after there had been an increase from 1.5% in 2002 (Brookes et al. 2004) to 2.6% in 2005. It is possible that the reduction observed during the three years prior to this study might have been the direct result of the impact of the roll-out of the antiretroviral therapy programme in the country that has prolonged the lives of some young parents living with HIV/AIDS. However, this issue needs further investigation.

4.9 Household income

Table 4.27 shows the household income by settlement type of all children in the study. This table shows that two-fifths (42%) of all households relies on formal salaries, a quarter of households (25.6%) did not have any income at all, and more than a fifth (22.1%) relied

Table 4.27: Household income by settlement type of children 0–18 years of age

Locality type	n	Formal salary (%) [95% CI]	Contribution by family members and relatives (%) [95% CI]	Government pensions or grants (%) [95% CI]	Grants/ donations by private welfare organisations (%) [95% CI]	Other sources (%) [95% CI]	No income (%) [95% CI]
Urban formal	4 092	55.5 [52.2–8.7]	3.6 [2.8–4.5]	14.4 [12.2–6.9]	1.6 [1.0–2.4]	2.3 [1.6–3.2]	22.7 [20.6–24.9]
Urban informal	774	33.6 [29.3–8.1]	4.3 [2.8–6.3]	16.2 [12.5–0.7]	2.9 [1.9–4.5]	3.7 [2.4–5.7]	39.3 [35.3–43.6]
Rural informal	1 519	22.0 [19.4–4.9]	5.5 [4.3–6.9]	38.0 [34.8–1.2]	5.5 [4.2–7.0]	3.6 [2.8–4.8]	35.5 [22.9–28.2]
Rural formal	368	47.4 [39.4–5.6]	4.1 [2.4–6.9]	9.4 [6.3–13.7]	2.3 [1.14.8]	6.8 [4.3–10.4]	30.1 [24.8–35.9]
Total	6 756	41.9 [39.7–4.1]	4.3 [3.7–5.0]	22.1 [20.4–4.0]	3.0 [2.5–3.7]	3.1 [2.6–3.7]	25.6 [24.1–27.1]

on government pensions or grants. The sources of income were varied for the different locality types – while the majority of households (55.5%) in urban formal areas and the largest proportions of rural formal areas (47.4%) relied on formal salaries, fairly large proportions of households in urban informal areas (39.3%) had no income at all and those in rural informal areas relied on government pensions or grants (38.0%). More than a third (35.5%) of rural informal households also had no income.

4.9.1 Discussion

The differences in household income shown by this study were mainly as expected. Both unemployment and poverty are rife in rural informal and urban informal areas. These findings are consistent with previous findings (see Mchiza, Davids, Labadorios & Weir-Smith 2009). An interesting finding is the high proportion of households, particularly in rural informal areas, that receive government pensions or grants. This shows the impact of the social grants system as a poverty alleviation strategy to improve the quality of lives of South Africans, including children. This finding further justifies the decision by the government administration led by President Jacob Zuma to prioritise rural development as a way of addressing economic inequalities between urban and rural communities.

4.10 Risk factors and risk environments for children

The risk contexts are most acutely represented by the home, neighbourhood and school environments. In this section, data are given on some risk factors and risk environments for children.

The primary agent of care in most cases is a child's primary caregiver. The large majority of the parents or guardians (69.5%, [95% CI: 67.4–71.6]) who were interviewed in the survey were the biological parents of the children 2–14 years of age who were selected to participate in the study.

Data obtained on monitoring of children 12–14 years of age by primary caregivers at various times of the day reveal similar patterns of monitoring the children by the caregivers irrespective of the time of the day involved, as well as over weekends.

For example, for the most part, the majority of caregivers were always present (78.9%), near enough to call (75.6%), and also required the child to inform them about where they were going (85.0%). It was also interesting to find that no differences were found between how males and females are monitored (data not shown). It was also encouraging to find out that caregivers were always present at home to monitor their children, particularly on the weekends when there is greater risk for abuse.

Vulnerability was assessed by looking at high-risk practices. It was found that just under half of young children 2–11 years of age were involved in high-risk practices such as being sent out alone from the home yard on an errand (46.1% reported 'never') and even fewer were away from the home yard without any adult supervision (about 61.2% reported 'never').

Table 4.28: Proportion of children, 12–14 years of age involved in high-risk practices

High-risk practices	Level (n)	Always (%) [95% CI]		Often (%) [95% CI]		Sometimes (%) [95% CI]		Never (%) [95% CI]	
Sent away from the home yard on an errand alone?									
Male	601	26.3	[21.1–32.3]	13.4	[10.1–7.7]	45.4	[39.3–51.6]	14.9	[11.3–19.3]
Female	646	15.8	[12.1–20.4]	13.0	[9.5–17.5]	47.4	[42.0–52.8]	23.8	[19.3–29.1]
Total	1 247	21.0	[17.7–24.8]	13.2	[10.6–6.3]	46.4	[42.3–50.5]	19.4	[16.1–23.1]
Left at home alone?									
Male	599	8.5	[5.3–13.3]	5.0	[3.0–8.2]	35.4	[29.9–41.3]	51.2	[45.0–57.4]
Female	646	3.8	[2.1–6.9]	3.0	[1.7–5.3]	31.8	[26.4–37.7]	61.4	[55.5–66.9]
Total	1 245	6.1	[4.1–9.0]	4.0	[2.7–5.8]	33.6	[29.6–37.8]	56.3	[52.0–60.6]
Left in the care of a person 15 years of age or younger?									
Male	599	2.6	[1.3–5.4]	3.4	[1.7–6.7]	18.9	[14.5–24.3]	75.0	[69.5–79.8]
Female	644	2.3	[1.0–5.3]	2.9	[1.7–4.8]	23.0	[18.0–28.8]	71.9	[65.9–77.2]
Total	1 243	2.5	[1.4–4.2]	3.1	[2.0–4.9]	21.0	[17.7–24.6]	73.4	[69.6–77.0]
Left in the care of a male family member?									
Male	598	7.1	[4.6–10.7]	4.5	[2.7–7.2]	37.7	[31.9–43.9]	50.8	[44.6–56.9]
Female	645	4.4	[2.8–6.9]	4.8	[2.8–8.0]	20.6	[16.5–25.5]	70.2	[64.5–75.3]
Total	1 243	5.7	[4.1–7.8]	4.6	[3.2–6.6]	29.1	[25.4–33.1]	60.6	[56.1–64.8]
Left in the care of a male non-family member?									
Male	598	2.0	[0.8–5.0]	1.1	[0.4–2.9]	4.9	[3.0–8.0]	92.0	[88.3–94.6]
Female	644	0.7	[0.3–1.8]	0.5	[0.1–3.1]	2.0	[1.0–4.2]	96.7	[94.3–98.2]
Total	1 242	1.3	[0.6–2.8]	0.8	[0.3–2.0]	3.5	[2.3–5.3]	94.4	[92.3–96.0]
Left in the care of a female non-family member?									
Male	599	4.0	[2.2–7.2]	2.9	[1.3–6.1]	5.4	[3.7–8.0]	87.6	[83.3–91.0]
Female	643	1.3	[0.6–2.5]	3.2	[1.5–6.7]	17.0	[12.7–22.3]	78.5	[72.9–83.3]
Total	1 242	2.6	[1.6–4.3]	3.0	[1.8–5.1]	11.2	[8.8–14.3]	83.1	[79.6–86.0]
Left the home yard without adult supervision?									
Male	598	13.2	[9.4–18.3]	10.8	[7.7–5.0]	35.3	[29.7–41.2]	40.7	[35.2–46.5]
Female	644	8.6	[5.5–13.0]	7.2	[4.8–10.7]	31.8	[26.7–37.4]	52.4	[46.8–58.0]
Total	1 242	10.9	[8.2–14.3]	9.0	[6.9–11.6]	33.5	[29.5–37.8]	46.6	[42.3–50.9]

With regard to risk practices and age, we found that the majority of children 2–11 years of age (95.4%) reported that they were never left in the care of a male non-family member. In addition, 85.6% of the children 2–11 years of age reported that they were never left home alone. However, 21% of children 12–14 years of age reported that they were sent away from the home yard alone on an errand, with males more likely to be sent out (26.3%) than females (15.8%) (see Table 4.28).

Children of both sexes were sent out alone from the home yard on an errand (21.0% indicated 'always' and 19.4% indicated 'never'), particularly males (26.3% indicated 'always' and 14.9% indicated 'never') when compared to females (15.8% indicated 'always' and 23.8% indicated 'never'). The differences were statistically significant. Fairly large proportions of both males and females (56.3% indicated 'never') were also left home alone, but this was less common among females (61.4% indicated 'never') than males (51.2% indicated 'never'). Although substantive, the difference was not statistically significant. However, females were less likely to be left in the care of a male family member (70.2% indicated 'never') than males (50.8% indicated 'never'). The difference was statistically significant. Similarly, more females were never away from the home yard without adult supervision (52.4% indicated 'never') compared to their male counterparts (40.7% indicated 'never').

Most importantly, no significant differences were found between the sexes on any of these three practices (data not shown).

The caregivers were also asked about the sleeping arrangements of children. Table 4.29 shows the sleeping arrangements of children 2–14 years of age. Overall, a larger minority

Table 4.29: Sleeping arrangements of children 2–14 years of age

Age/Sex	n	Where does the child usually sleep at night?		
		Alone in own bed, own bedroom (%) [95% CI]	Alone in own bed, shared room (%) [95% CI]	In shared bed (%) [95% CI]
2–4 years				
Male	700	4.9 [3.3–7.1]	10.7 [8.1–14.0]	84.4 [80.5–87.6]
Female	598	6.8 [4.7–9.8]	9.7 [7.0–13.2]	83.5 [79.2–87.0]
Total	1 298	5.8 [4.4–7.6]	10.2 [8.3–12.6]	83.9 [81.0–86.5]
5–9 years				
Male	880	8.9 [6.6–11.8]	23.2 [18.7–28.3]	67.9 [62.6–72.8]
Female	879	9.2 [7.0–11.9	19.0 [15.4–23.3]	71.8 [67.1–76.0]
Total	1 759	9.1 [7.4–11.1]	21.1 [18.1–24.4]	69.9 [66.3–73.2]
10–14 years				
Male	958	24.5 [20.6–28.9]	33.8 [29.5–38.5]	41.6 [37.1–46.4]
Female	1 011	17.8 [14.2–22.0]	26.1 [22.2–30.4]	56.2 [50.8–61.4]
Total	1 969	21.1 [18.4–24.1]	30.0 [27.0–33.2]	48.9 [45.3–52.5]
All (2–14 years)				
Male	2 538	14.4 [12.4–16.7]	25.0 [22.5–27.8]	60.5 [57.6–63.4]
Female	2 488	12.2 [10.3–14.4]	20.1 [17.8–22.7]	67.6 [64.2–70.8]
Total	5 026	13.3 [11.8–15.0]	22.6 [20.9–24.4]	64.1 [61.7–66.3]

Table 4.30: Sexual harassment of female children 12–14 years of age at school

Reported sexual harassment	n	Always/often/ sometimes (%) [95% CI]	Never (%) [95% CI]	No information (%) [95% CI]
Males sexually harass females by touching, threatening, or making rude remarks				
Male	595	31.5 [25.9–37.7]	49.1 [43.1–55.1]	19.4 [15.0–24.8]
Female	630	35.8 [30.0–42.0]	51.2 [45.2–57.1]	13.0 [9.5–17.6]
Total	1 225	33.6 [29.6–38.0]	50.1 [45.9–54.3]	16.2 [13.3–19.7]
Male educators propose relationships with female pupils				
Male	596	7.8 [4.7–12.6]	58.5 [52.4–64.3]	33.7 [28.1–39.8]
Female	635	8.4 [5.7–12.3]	64.1 [58.7–69.2]	27.5 [22.7–32.9]
Total	1 231	8.1 [5.9–11.1]	61.3 [57.2–65.2]	30.6 [26.9–34.5]

of males slept alone in their own bed in a shared room (25.0%) than did females (20.1%). However, a larger majority of females (67.6%) than males (60.5%) reported that they shared beds. Both differences between males and females were statistically significant. The same patterns of sleeping arrangements were found among both groups 5–9 and 10–14 years of age. However, no sex differences were found for younger children 2–4 years of age as they mostly shared beds (83.9%), as expected.

With regard to modes of transport used to and from school by children 2–14 years of age, the same overall pattern of results was found for all children in this group and also for both those in groups 5–9 and 10–14 years of age, with the majority of those 2–14 years of age reporting going on foot (70.4% [95% CI: 67.6–73.2]), followed by transport arranged and paid for privately, and the remainder being own family's transport or public transport.

It is critical that schools are safe environments for children as they spend most of their time at school. With respect to the safety at school of children 12–14 years of age, the children mostly reported that educators always attended classes (77.1%) and also made sure no unauthorised person could enter the school (71.7%). However, they also reported that the educators did not watch the children at break times (only 45.2% indicated that they did so 'always'), watch children leaving school (only 39.7% indicated that they did so 'always'), or monitor the toilets (only 34.2% indicated that they did so 'always').

Table 4.30 shows data about the sexual harassment of female children at school reported by children 12–14 years of age of both sexes. A third of the children (33.6%) reported that males always/often/sometimes sexually harass females by touching, threatening, or making rude remarks. More alarmingly, it was also found that one-twelfth of the children (8.1%) indicated that male educators proposed relationships with female pupils (at school). No significant sex differences were found between reports of both practices by the males and females.

4.10.1 Discussion

The exposure of children to vulnerability in terms of inadequate care, be it at home or away from home, increases the risks of HIV infection. These areas of risk encompass three domains, namely, within the home, in transit between the home and school or in the immediate vicinity of the home, and at school. Within the context of the home, caretakers (mostly parents) reported a great deal of vigilance over their children,

particularly with children under 11 years of age and if they are females. It would appear that such vigilance may be justified given the finding that most abuse occurs within the home and by someone who is familiar to the child. Indeed, if 5% of children in South Africa are estimated to suffer sexual abuse, then the current high levels of parental oversight over their children is not being extended to this small group of individuals. It is possible that risky family contexts (not captured here) may well provide the basis for such vulnerabilities.

Given the large number of children who travel on foot between school and home, it is not unlikely that situations of vulnerability may develop and contribute to the experience of abuse of children, particularly female children. While the school environment appears to be safe for the most part, greater attention needs to be focused on opportunistic contexts of vulnerability such as in the toilets or when children leave the school premises.

On their own, these factors may not constitute substantial risk. However, risk is often cumulative and taken as a whole, risk in one aspect is often associated with risk in other aspects. In this study, possible risk factors that might put the children at risk of sexual abuse and therefore also HIV infection included:

- some males reported that they were 'sometimes/hardly ever' present at home at night;
- some children were sent away from the home yard on an errand alone;
- others were away from the home yard without adult supervision;
- some males and females were left home alone;
- some females were left in the care of male family members;
- some females went away from their home yard without adult supervision;
- some children, including those attending a crèche, walked to and from school on foot;
- a few male educators are believed to have proposed relationships with female pupils (at school).

Many of these findings replicate those obtained by Brookes et al. (2004) and Shisana, Mehtar, Mosala et al. (2005). It is clear that the protection of children requires all stakeholders (children, parents/caregivers and educators) to act in concert in identifying areas and situations of vulnerability and minimising these risks.

CHAPTER 5

Recommendations

5.1 Child health

The vast majority of children (close to 90%) visited a public or private outpatient clinic the last time they were sick, indicating a high rate of utilisation of health-care services in South Africa. However, over 20% of children were hospitalised for an average duration of 6.9 days. This demonstrates both the failure of the primary health-care system to prevent and adequately manage diseases and the low quality of care provided in these facilities.

It is recommended that:

- The Department of Health (DOH) prioritise the strengthening of the primary health-care system as the national health response, particularly expanding the number and scope of work of community health workers to include high impact, but low cost child health and nutrition interventions. The DOH should also establish systems to ensure active follow-up to minimise losses within the health-care continuum.
- Policy-makers and managers in the public and private health sectors should routinely offer HIV testing for sick children and develop the HIV capacity of primary health care providers for early HIV identification and the timely referral and management of advanced HIV infection in children.

5.2 Maternal health

The study found almost universal access to antenatal care (ANC) and skilled attendant deliveries by doctors, nurses and midwives. Of interest is the fact that at least three-quarters of all babies are born in hospitals. The increasing maternal and neonatal mortality reported in the 'Saving mothers and saving babies reports' (National Enquiries in Maternal Deaths [in press]; DOH 2007c, 2009a) is an indication of the poor quality of services in hospitals, particularly in the health maternities and neonatal-care units.

It is recommended that:

- DOH should put a greater emphasis on improving the quality of care, particularly in maternity and neonatal care units. An accreditation system should urgently be institutionalised to monitor the quality of care in our health facilities regularly and serve as a mechanism to hold health managers accountable for the health outcomes of mothers and children.

5.3 Infant and child nutrition

Despite the fact that breastfeeding is still considered to be the norm in South Africa, the study found that only 25% of infants were exclusively breastfed during their first six months; the vast majority (75%) were either formula fed or mixed fed. The high level of mixed feeding increases the children's risk of HIV infection, illness and death.

It is recommended that:

- The current policy and approach to the promotion and support of exclusive breastfeeding should be revised to put a stronger focus on community and home-based support for mothers through community-based organisations, community leaders and community workers.
- The formula feeding policy should be revised in line with the new World Health Organization (WHO 2009c) recommendations that include antiretroviral therapy for

HIV-infected mothers at advanced stage of disease and extended infant antiretroviral prophylaxis in breastfeeding mothers to reduce the risk of mother-to-child transmission through breastfeeding.

5.4 HIV prevalence in children

The study found an HIV prevalence of 2.1% among the youngest children 0–2 years of age and a prevalence of 3.3% in children 0–4 years of age . This pattern could indicate the possible positive impact of the national prevention of mother-to-child transmission (PMTCT) programme in the two years prior to the study, where coverage had significantly increased to reach almost three-quarters of HIV-infected mothers with antiretroviral prophylaxis, in a levelling off of the HIV epidemic. Nevertheless, even at this level of prevalence, the number of children living with HIV remains high. One should keep in mind that the increasing number of HIV-infected children receiving antiretroviral therapy will make the interpretation of HIV-prevalence levels in this age group increasingly difficult in the future.

It is recommended that:

- The DOH's accelerated efforts to implement PMTCT should put emphasis on ensuring the access pregnant women with advanced HIV/AIDS have to antiretroviral therapy is improved to further reduce new infections and move towards eliminating paediatric HIV/AIDS.
- The DOH should revise the national guidelines to include the early introduction of antiretroviral therapy for infants as soon as infection is confirmed, and establish adolescent-friendly services in our treatment centres to respond to the specific needs of growing numbers of HIV-infected adolescents.
- The DOH should establish an expanded programme on immunisation (EPI)-based surveillance system to track HIV infections in children continually so as to inform policies and comprehensive HIV prevention, care and treatment services for children.

5.5 Media and communication

Children have very high levels of access to broadcast and print media and this access is related to obtaining useful information about AIDS. There is good overall awareness of the main national HIV/AIDS communication programmes, but there is lower awareness in rural areas, and the government's Khomanani campaign lags behind the other programmes. Home-language speakers of English, Afrikaans, Xitsonga and Tshivenda are marginalised in comparison to speakers in the Nguni and Sesotho groups. There is markedly lower awareness of programmes amongst white youth. Parents, friends and health facilities are the most prominent sources of AIDS information, and there is very low awareness of the national toll-free AIDS helpline. While parents discuss sexual abuse with children, they are less likely to discuss HIV transmission or prevention.

It is recommended that:

- Although this study did not examine the content of information, it remains important that communication campaigns conduct research among children to establish gaps and needs in relation to HIV/AIDS communication, and that communication content takes into account the changing nature of the epidemic over time.
- The government's Khomanani campaign should include a strategy that is specific to reaching children to communicate age-relevant information about HIV/AIDS via mass

media channels. Content should be determined through a needs analysis and should take into account the need to complement information delivered through schools. This should include an emphasis on child sexual abuse and the rights of children.
- All national programmes should coordinate their efforts to reach rural communities to a greater extent, and also address the marginalisation of language and race groups identified in the study.
- The national toll-free AIDS helpline is a well-established resource that is under-promoted and all programmes should actively seek to obtain high awareness of the number and encourage its use.

5.6 Orphans

The overall level of orphanhood for those 2–18 years of age appears to have slightly increased over the seven years prior to the study, from 15.6% in 2002 (Shisana & Simbayi 2002) and 14.4% in 2005 (Shisana, Rehle, Simbayi et al. 2009) to 19.3% found in the present study. As expected, the proportion of paternal orphans was significantly higher than both maternal and double orphans. Furthermore, it was also found that the likelihood of being an orphan increases with age, where 32.7% of teenagers 15–18 years of age were orphans. Lastly, Eastern Cape had the highest number of orphans, followed by KwaZulu-Natal. Rural informal areas had the highest burden of orphanhood.

It is recommended that:
- The Department of Social Development should continue monitoring the number of orphans in the country by working closely with research institutions such as the HSRC and universities. The data obtained should be used to ensure that there are adequate plans for orphans in the future by ensuring that services such as child support grants are easily accessible to orphaned children.
- The higher proportion of paternal orphans suggests that a significant proportion of South African children grow up without fathers (this excludes the children whose fathers are alive and are not part of their lives) and that there is a need to further research these households to identify the needs and influences on children. Interventions to mitigate this need to be developed such as the HSRC's Fatherhood Project[15] that may encourage males within the community to be male role models for fatherless children through mentoring. The same can be done for maternal and double orphans by focusing on mothers within the community.
- The loss of parents at a critical age such as 15–18 years of age is of concern as this age is a critical developmental stage of adolescence, where identity is formed, sexual interest develops and there is emotional turmoil in the developing teenager. Sexual debut may take place without parental guidance or protection from sexual predation by adults. The Departments of Education and Social Development can play important roles in identifying orphans who should be exposed to supportive psycho-social programmes that are designed to complement the life-skills programme at schools.
- All provinces with the largest proportions of orphans, particularly Eastern Cape and KwaZulu-Natal, should develop a response for orphans that is holistic and multidisciplinary. The response should take into account that both provinces have rural areas that are more likely not to be reached by services and development, thus having a negative influence on orphaned children who might not have the means to go to where the services are, without adult assistance.

15 http://www.hsrc.ac.za/Research_Project-746.phtml

5.7 Child-headed households

The study found that the levels of orphanhood appeared to have increased over the seven years prior to the study, while, as expected, child-headed households appear to have reduced in number significantly, probably due to parents living longer after receiving antiretroviral treatments.

It is recommended that:

- Programmes for orphans and vulnerable children (OVC) should be further strengthened so that both the infected and affected children are supported adequately and also protected from all forms of abuse. As alluded to above, the strengthening of both antiretroviral treatment and PMTCT programmes also ensures that fewer young parents die and leave their children orphaned and in a position where they have to head households.

5.8 Household income

It was reported that that 25.6% of households did not have any income at all and that more than a fifth (22.1%) relied on government pensions or grants. Furthermore, the largest proportions of households in urban informal areas (39.3%) had no income and those in rural informal areas relied on government pensions or grants (38.0%). More than a third (35.5%) of rural informal households also had no income.

It is recommended that:

- Since it is the children who bear the brunt of poverty, the Department of Social Development should increase their campaign to reach out to both rural informal and urban informal areas to ensure that children in households without income are reached by the child income grant. By working with the Department of Education, it is possible to identify the children at schools and increase coverage by working through the schools in these areas.
- The Department of Rural Development and Land Reform should accelerate rural development with special focus on rural informal areas that are more likely to have households with no income or who are dependent on government grants and pensions. Development should not only include the development of infrastructure but also provide skills development that would lead to employment, alleviate poverty and decrease the number of families in these areas that have no income and need state grants.
- Government, working through Treasury, Social Development, Public Works and other relevant departments, should consider implementing the proposed basic income grant for the 25.6% of families that have no income. This grant should be sustainable if beneficiaries are encouraged to give back for the income they receive from government by working on public works projects. For example, they could do community development work. This initiative would ensure that individuals gain work experience in a certain field, gain a sense of pride when working for a living and in the long run ensure that beneficiaries become employable in future, and thus the number of unemployed people and those who are dependent on the state for income could be reduced.

5.9 Protecting children from sexual abuse

The present study's findings have highlighted several risk contexts at home, school and between the two where children are at risk of sexual abuse and therefore HIV infection.

It is recommended that the Department of Social Development, together with the Department of Education and the Department of Health, at both national and provincial levels, undertake the following actions with regard to protecting children from sexual abuse:

- Raise awareness of the extent and unacceptability of child sexual abuse by promoting the idea that it is everyone's responsibility to prevent such abuse. This is to ensure that while many intervention programmes target children, intensive public education campaigns should be initiated to emphasise how caregivers can safeguard children. Social and cultural factors that emphasise nurturing and care need to be given prominence in such a campaign.
- Policy-makers responsible for implementing social protection programmes for children need to ensure that they have accurate information that is evidence-based about the causes and consequences of child sexual abuse so that they can take remedial action (examples include better housing, better policing and better social services).
- Policy-makers and researchers need to form partnerships to rigorously evaluate and strengthen existing child sexual abuse prevention programmes at the level of schools and communities. While school level interventions could be narrowly focused, those at the community level should seek to empower communities to find local solutions that help protect children.
- The initiative by the South African Council for Educators (SACE) to establish a website that publishes the names of educators found guilty of sexual misconduct with pupils is a positive development that must be commended, and the employer should ensure that the register is used to remove offenders from the employment roll and prevent offenders from joining the profession, whether in public or private schools. This will protect children from repeat sexual offenders who until recently could change schools and continue to abuse children sexually in another school.

Appendix 1: Methodology

1. Community mobilisation for fieldwork

The HSRC and its partners designed and implemented a multifaceted, study-specific and proactive communication strategy to encourage and facilitate participation by households and individuals selected for the survey, particularly in enumeration areas (EAs) that previously had low participation. The main purpose was to advise the general public that the survey was being conducted, the way in which it was going to be conducted and the importance of participating. This required a communication strategy that addressed the communities located near sample EAs as well as the national audience. Flow Communications was appointed to implement the advocacy campaign.

Components of the strategy included:
- interpersonal briefings by HSRC research team and fieldworkers;
- posters and flyers in all official languages;
- press releases;
- communication via national broadcast and print media;
- communication via community radio and newspapers;
- use of online media;
- promotion of the study by Survey Champions.

2. Ethical considerations

This study received Institutional Review Board (IRB) approval from the Research Ethics Committee of the HSRC (REC 2/23/10/07) and Human Subjects Review from the United States Centers for Disease Control and Prevention's (CDC's) Global AIDS Programme before the fieldwork commenced. The REC has Federal-wide Assurance (FWA) for the Protection of Human Subjects accreditation with the USA's Department of Health and Human Services (DHHS).

2.1 Informed consent procedures

All youth and adults who agreed to participate were required to provide either written or verbal (where a respondent was illiterate) consent. A waiver of written consent per 45CFR46 was granted by CDC for cases where respondents are unable to provide written consent, but consent verbally. Where such situations arose, field staff signed on behalf of the participant, certifying that informed consent had been given verbally by the participant. Furthermore, a witness also signed the consent form to certify that informed consent had been given verbally by the participant. Parents and guardians of children under 18 years of age were asked to give informed consent for inclusion of children in the survey and verbal assent was obtained from all children who gave a specimen for HIV testing. Fieldwork staff were trained in informed consent procedures to ensure that voluntary informed consent was obtained for all respondents. The research that was undertaken on children adhered to the new South African Children's Act (2007) (see Bamjee, Grant, Mushariwa et al. 2007).

2.2 Procedures to ensure confidentiality

The interview with each respondent was held either inside or outside a house. Efforts were made to avoid interference from other members of the household. In addition,

no names of individuals were recorded either on the questionnaires or on specimens. Instead, bar codes on questionnaires, blood samples and HIV-testing results were linked electronically. To ensure further confidentiality, data were analysed nationally, provincially and by EA type and not by smaller geographic units. The EA number was also separated from the data files.

2.3 Motivation for conducting anonymous HIV testing

As with the previous two surveys, the respondents in the study were not given their HIV-test results. The rationale included the potential for response rates to be reduced because sampled respondents might not wish to know their status, and the potential for stigma. The approach also preserved the confidentiality of a person's status, as fieldworkers had no way of knowing HIV-antibody test results.

2.4 Provision of HIV testing and counselling

This study followed the principles regarding linked anonymous confidential or anonymous testing:

- Respondents were informed about the purpose of giving a dried blood spot (DBS) sample for HIV testing and HIV testing was only conducted on the specimens of respondents who gave their consent (or whose parent or guardian had given consent, in the case of children).
- Respondents were not offered voluntary counselling and testing (VCT) during the interview process, but those who wished to get information about their HIV status were given a card that referred them to a nearby VCT facility. (The financial implications of directly offering VCT as part of the study would have made the costs prohibitive. In addition, offering VCT instead of anonymous testing may have adversely affected participation. A follow-up study is planned to explore this issue.)

2.5 Other ethical considerations

In order to comply with the mandatory reporting of child abuse (Child Care Act [No. 74 of 1983]) and the Children's Act as Amended (No. 38 of 2005) and Criminal Law (Sexual Offences and Related Matters) Amendment Act (No. 32 of 2007), which requires reporting of any sexual crime against a child to the South African Police Service (SAPS) and failure to report is a criminal offence (see Bamjee et al. 2007).

- No questions were asked directly about child abuse in the survey.
- Voluntary information about a child's experiences of sexual abuse was handled on an individual case-by-case basis in consultation with the supervisors and the principal investigators or project directors of the study.
- Details of the nearest social work offices and Child Protection Units were automatically made available to each participating household if deemed necessary, or upon request.

In order to make sure that the research was conducted according to the highest ethical standards, the following additional measures were used:

- Each section of the questionnaires contained a short introduction, saying what was covered in the section, explaining why the questions were being asked, and assuring respondents of the confidentiality of their responses.
- Fieldworkers were trained in research ethics and ethical guidelines included in the training manual. Special training was also given on the management of children and of crises that might arise in the field.
- Fieldworkers were monitored by their supervisors to ensure that they complied with all ethical provisions in the study.

Vulnerable groups: This population-based household study covered the general population, but also included some vulnerable groups, including people with terminal illness, children, adolescents, pregnant women and people living with HIV/Aids. Where respondents were unable to take part in the survey due to poor health and mental capacity, fieldworkers made a decision (in consultation with a supervisor) to exclude them from the study.

3. Fieldwork procedures

The fieldwork was conducted in the period from end of May 2008 to beginning of March 2009. Fourteen HSRC junior researchers and research trainees studying towards masters and PhD degrees acted as provincial survey coordinators. In addition, 165 nurse fieldworkers, 27 nurse supervisors and 40 field editors were recruited for the survey. A training manual adapted from the previous surveys was used for fieldworker training, with a focus on informed consent procedures

Each provincial coordinator was responsible for about two teams of fieldworkers. Each team comprised one nurse supervisor and three to five nurse fieldworkers, accompanied by one field editor who was not a nurse. Where possible, fieldworker teams were matched to respondents according to demographic characteristics such as race, ethnicity and language.

The selected household members (or child's parent/guardian in the case of children 11 years of age and younger) were asked to provide informed consent to be interviewed. Apart from asking parents or guardians to recall their children's immunisation history, the fieldworkers also asked for the children's Road to Health cards and noted what they contained. Table A1 shows the various questionnaire modules by age group. However, it should be noted that no data from respondents 19 years of age and older are presented in this report.

After the interview, the participant (or child's parent/guardian) was asked to provide consent for a blood specimen to be taken for HIV testing. In addition to obtaining consent for specimen collection from the child's parent/guardian, verbal assent for specimen collection was also obtained from all children who gave a specimen for HIV testing.

Fieldwork staff were trained in informed consent/assent procedures to ensure that appropriate voluntary informed consent/assent was obtained for all respondents.

3.1 Specimen collection

DBS specimens were collected from each participant who consented (or assented) to provide a specimen. Blood spots were normally collected on absorbent paper by pricking a finger for older children or pricking a heel or toe in the case of infants. This specimen-collection strategy was chosen because it offers unique advantages for large-scale population-based surveys and the HSRC used this strategy successfully in the 2005 national household HIV survey as well as other large-scale HIV surveillance surveys. Whole blood obtained by finger-prick was spotted on to each of the five circles of the Guthrie card, spotting approximately 50 microlitre (µl) of blood per circle. Fieldworkers were instructed to fill at least three circles, and were encouraged to fill all five circles if sufficient blood could be obtained without causing discomfort to the participant.

Table A1: Questionnaire modules by age group

Questionnaire module	Children under two years of age (reported by mother/ guardian)	Children 2–11 years of age (reported by parent/ guardian)	Children 12–14 years of age (self-reported)	Youth 15–24 years of age (self-reported)	Adults 25+ years of age (self-reported)
Demographics (age, gender, race, language, geotype or locality type, province, education, employment, language, marital status, etc.)	✗	✗	✗	✗	✗
Care and protection of child; home environment; orphan status	✗	✗	✗	✗ (only up to 18 years of age)	
Health status including hospitalisation history	✗	✗	✗	✗	✗
Mother's use of antenatal services, delivery services and PMTCT services; infant feeding practices and weaning practices	✗ (mother)			✗ (only women concerning pregnancy)	✗ (only women concerning pregnancy)
HIV-testing history and risk perception	✗ (mother)	✗	✗	✗	✗
Circumcision status (males only)	✗	✗	✗	✗	✗
Knowledge, attitudes, beliefs and practices, and values about HIV/ AIDS and about HIV-related practices and behaviours	✗ (mother)	✗ (parent/ guardian)	✗	✗	✗
Sexual behaviour			✗	✗	✗
Drug and alcohol use				✗	✗
Exposure to HIV-behavioural change communication	✗ (mother)	✗ (parent/ guardian)	✗	✗	✗
Social norms and values				✗	✗
Attitudes towards male circumcision	✗ (mother)	✗ (parent/ guardian)	✗ (mainly males)	✗ (mainly males)	✗ (mainly males)
Health status	✗			✗	✗
Impact on health system	✗			✗	✗

3.2 Quality control of fieldwork

A broad range of quality control measures was implemented during data collection. Measures implemented before the start of fieldwork included:

- checking all maps for errors such as pixelisation, errors in the legend such as incorrect route descriptions, and checking overall image quality;
- sorting all relevant maps and fieldwork materials according to EA and checking that all materials were accounted for and in good condition;
- checking fieldwork kits and materials sent to field supervisors for completeness and correctness;
- rigorous record-keeping and tracking of study forms, including the number of households and questionnaires completed, and specimen tracking;
- intensive training of fieldwork teams as well as assessing fieldworkers after training.

Prospective fieldworkers had to meet set minimum standards to take part in the study. This study implemented a number of additional measures to enhance data quality during the field survey:

- As a first level of control, 14 HSRC junior researchers and research trainees studying towards either their masters or PhD degrees acted as provincial survey coordinators, each in charge of two or three fieldwork teams. This group represented the interests of the HSRC in the field, and had to check that teams followed the stipulated fieldwork and administrative procedures.
- The second level of control consisted of the team supervisors. It was the duty of supervisors to carry out the study according to the agreed protocols, including finding the correct EA and identifying the selected visiting points (VPs) in each EA. In addition, the supervisors assisted with the selection of individual respondents by using the Kish grid at household level in order to reduce the chances of bias because of erroneous selections carried out by fieldworkers. Another important task of the supervisors was to ensure the integrity of the specimen collection by checking bar codes on the samples, tracking sheets and questionnaires to ensure the right specimen would be linked to the right questionnaire.
- The third level of control in the survey was the use of editors in each team. The main task of editors was to check completed questionnaires for errors. This was normally done while the team was in the field to allow for easy revisits if required. Another important task of editors was to assist the supervisors in identifying the EA and the selected VPs by means of the set of maps and a global positioning system (GPS) device, using exact coordinates supplied by the office. In addition, editors also assisted in the correct selection of individual respondents. The close involvement of coordinators, supervisors and editors in the fieldwork was intended to ensure that work done in each VP surveyed received the necessary supervision.
- A fourth level of control was a small team of independent checkers who revisited EAs to ensure adherence to protocols. Checkers used a shortened questionnaire for this purpose. During revisits, checks were made on the correct spatial location of VPs, the listing of respondents, the selection of individual respondents and the correct completion of household and individual questionnaires during interviews.

4. Laboratory methods

4.1 Specimen tracking

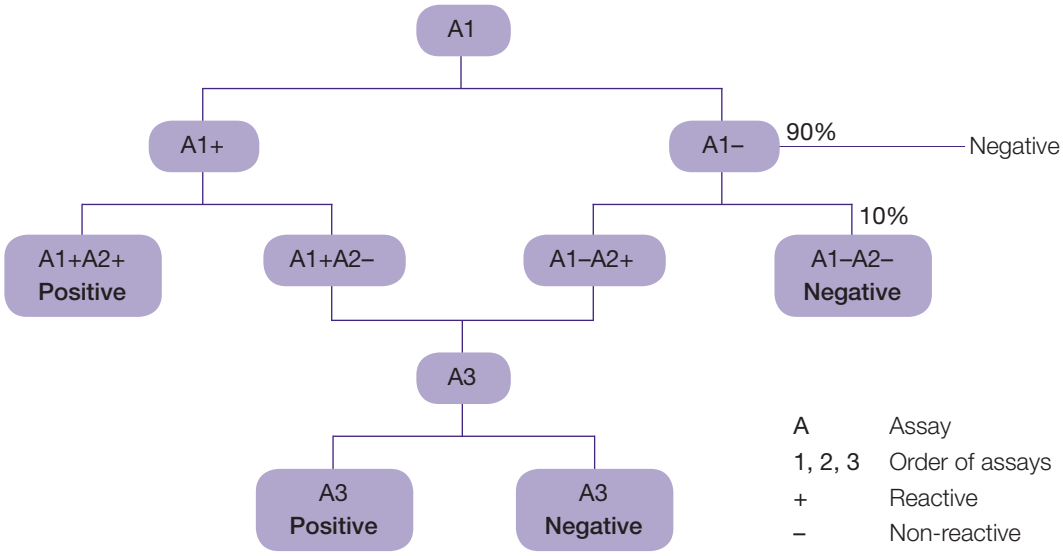
Specimens and specimen tracking sheets with the DBS bar code were sent to the laboratory in transparent Ziploc bags containing desiccant. Consecutively numbered laboratory bar codes were assigned to the specimens as they were received by the laboratory. The specimen bar codes were matched to the bar codes on the laboratory tracking sheets. The specimen bar-code numbers were also scanned or typed into an Excel spreadsheet. The Guthrie cards were labelled with the laboratory bar-code number. Laboratory managers performed a second quality control (matching bar codes to tracking sheets and examining specimen quality) and signed off the tracking sheets for laboratory processing.

4.2 HIV-antibody testing

DBSs were punched into a test tube pre-labelled with the corresponding laboratory testing bar-code number. The puncher was decontaminated by punching four blank spots after each DBS to ensure no carry-over. Each filter paper disc was eluted overnight at 4 °C with phosphate buffered saline (PBS, pH 7.3–7.4). An aliquot of the eluted sample was then used for performing the HIV-testing assays, following the manufacturer's instructions using the testing strategy shown in Figure A1.

Children under two years of age were tested for the presence of HIV antibodies according to the methods described above. In addition, given that the HIV-antibody test does not distinguish between HIV infection and the presence of passively acquired maternal HIV antibodies in infants, children under 24 months of age were also tested for HIV infection, using a polymerase chain reaction (PCR) to confirm HIV-1 infection (Roche Cobas Ampliprep/Taqman, Roche Diagnostics, Mannheim, Germany). Furthermore, all seronegative specimens of infants 0–12 months of age were subjected to PCR testing in order to detect any false-negative samples (HIV nucleic acid positive/HIV antibody negative) in this age group.

Figure A1: HIV testing strategy



4.3 Detection of antiretroviral drugs

The presence of antiretroviral drugs in HIV-positive DBS samples was confirmed by means of high performance liquid chromatography (HPLC) coupled to tandem mass spectrometry. Qualitative detection of Lopinavir, Ritonavir, Nevirapine, Efavirenz, Indinavir, Saquinavir, Zidovudine, Lamivudine and Stavudine in DBSs was carried out by a validated method, using minor modifications of the method of Koal, Burhenne, Romling et al. (2005).

Antiretroviral drugs were extracted from the DBS with 80% methanol, with 20% 0.2M zinc sulphate containing an internal standard. HPLC was carried out on a Phenomonex Fusion RP column (5 × 2 × 4 µm), using a methanol/10 mM ammonium acetate gradient to effect elution. Detection of antiretroviral drugs was carried out using an Applied Biosystems API 4 000 tandem mass spectrometer in the MRM detection mode for each drug, using appropriate MRM transitions. Blank and quality control cut-off samples were included with each run. The limit of detection for each drug was set at 50 ng/ml, a sensitivity set point that is normally applied for the quantitative monitoring of drug levels in the blood. Values detected above this limit were considered as positive and those below as negative.

5. Weighting the sample

Due to the sampling design of the survey, some individuals have a greater or lesser probability of selection than others. To correct this problem, sample weights are introduced to correct for bias at the EA, household and individual levels and also adjust for non-response.

Weighting procedures were undertaken before analysis of the data as follows: the data file of drawn EAs contained the selection probabilities as well as the sampling weights of these EAs. These weights reflected the disproportionate allocation of EAs according to the stratification variables – race, locality type and province. Another file contained the selection probabilities of the VPs. The inverse of the sampling probability gives the sampling weight. After the VPs were visited, some VPs were invalid or refused to participate. The sampling weights of the VPs were then recomputed as the counted number of VPs in the EA, proportionally corrected for invalid VPs and divided by the number of VPs participating in the survey. The final VP-sampling weight was the product of the EA-sampling weight and the VP-sampling weight after adjusting for invalid VPs and refusal.

Demographic and HIV-testing information on all persons in selected households in all chosen EAs was then assembled in order to calculate individual sample weights. In each of the four age groups (0 to under 2, 2–14, 15–24 and 25+ years), the individual weight was the total number of individuals in that age group in each valid household/VP. These individual sample weights were also adjusted for HIV-testing non-response. In the final step, the information at the individual level was integrated and the final sampling weight for each data record was calculated. This weight is equal to the final VP-sampling weights multiplied by the selected person's sampling weight per VP per age group. Since the results were to be reported for various age strata representatives of the 2008 population of South Africa, the final sampling weight for each data record was benchmarked to the mid-year population estimates for 2008 provided by Stats SA (2008). A macro system called CALMAR implemented in statistical analysis software (SAS version 9) was used for benchmarking. This process produces a final sample representative of the population in South Africa for gender, age, race, locality type and province.

6. Data management

Data capture was contracted out to Maphume Research Services. The data was double-entered from the original questionnaires, using Census and Survey Processing System (CSPro), a computer software program. A database was designed with range restrictions to ensure that data captured were not out of range. Once the data were received from data capture, further data-cleaning procedures were implemented. Duplicate records were identified and removed. Extensive internal consistency checks against the original questionnaire were done to ensure the data base accurately reflected the data collected in the field. Consistency checks were carried out to ensure that no more than four individuals from a household were included in the database and all individuals were linked to their respective EAs and VPs.

Internal data inconsistencies in terms of inappropriate sex-specific responses were re-coded to missing, such as respondents who were coded as men and reported using female-specific contraceptive methods or pregnancy. In each instance, fewer than 10 values were re-coded to missing. Inappropriate ages of becoming pregnant (<10) were also re-coded to missing. Other internal inconsistencies were left intact, reflecting the right of a person to refuse to answer particular questions and the natural errors that occur in long questionnaires administered in face-to-face interviews. Individual databases were merged and managed using SAS version 9.

Appendix 2: Table A2

Table A2: HIV prevalence, socio-demographic characteristics, coefficient of variation and design effect (0–18 years of age)

Variable	Count	n	Response rate (%)	SE r	Prevalence %	SE r	CV r	Deff	Deft
Total	9 786	5 756	58.8	0.50	2.9	0.4	12.5	2.658	1.630
Age									
0–4	3 151	1 526	48.4	0.89	3.3	0.8	24	2.853	1.689
5–9	2 022	1 168	57.8	1.10	2.8	0.6	23	2.220	1.490
10–14	2 351	1 509	64.2	0.99	1.3	0.4	30	1.827	1.352
15–18	2 262	1 553	68.7	0.98	4.5	1.1	24	3.187	1.785
Sex									
Male	4 939	2 869	58.1	0.7	2.9	0.6	20.8	3.747	1.936
Female	4 847	2 887	59.6	0.7	2.8	0.4	13.9	1.608	1.268
Locality									
Urban formal	5 665	3 196	56.5	0.7	2.7	0.6	22.5	3.5760	1.8910
Urban informal	1 135	727	64.1	1.4	4.5	0.8	18.0	0.8094	0.8997
Rural formal	560	331	59.8	2.1	1.9	0.9	44.3	1.3320	1.1540
Rural informal	2 426	1 491	61.5	1.0	2.8	0.5	19.3	2.3220	1.5240

Note: Count = number of cases in the sample responded, n = number of cases tested, r = response rate, SE r = standard error of the response rate, SE p = standard error of prevalence, CV r = coefficient of relative covariation, Deff = design effect and Deft = design factors (square root of Deff)

Appendix 3: Table A3

Table A3: Demographic profile of youth 0–18 years of age interviewed

Variable	Total	Percentage (%)
Sex		
Male	4 538	50.61
Female	4 428	49.39
Total	8 966	100.00
Age group in years		
0–<2	1 630	18.18
2–4	1 373	15.31
5–11	2 685	29.95
12–14	1 310	14.61
15–18	1 968	21.95
Total (0–18)	8 966	100.00
Race		
African	5 793	64.61
White	660	7.36
Coloured	1 755	19.57
Indian	736	8.21
Other	22	0.25
Locality type		
Urban formal	5 062	56.46
Urban informal	1 075	11.99
Rural informal	2 302	25.67
Rural formal	527	5.88
Province		
Western Cape	1 187	13.24
Eastern Cape	1 255	14.00
Northern Cape	603	6.73
Free State	579	6.46
KwaZulu-Natal	1 689	18.84
North West	738	8.23
Gauteng	1 329	14.82
Mpumalanga	717	8.00
Limpopo	869	9.69

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