
**THE NATIONAL
HOUSEHOLD
HIV PREVALENCE
AND RISK SURVEY
OF SOUTH AFRICAN
CHILDREN**

THE NATIONAL HOUSEHOLD HIV PREVALENCE AND RISK SURVEY OF SOUTH AFRICAN CHILDREN

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FOREWORD



This study is dedicated to all the children of South Africa and to those organisations that work towards alleviating the plight of children – in South Africa and worldwide.

On behalf of the Nelson Mandela Children's Fund, I would like to comment on the importance of *The National Household HIV Prevalence and Risk Survey of South African Children*. The study was commissioned by the Nelson Mandela Children's Fund and the Nelson Mandela Foundation as part of the larger Nelson Mandela/HSRC Study of HIV/AIDS 2002. The aim was to give us, and all other organisations involved with children, a better understanding of what is actually happening to children in South Africa today, particularly in relation to HIV/AIDS.

HIV/AIDS has worsened the plight of many and South African children are experiencing the impact of the epidemic in alarming ways. Particularly worrying is an expected increase in child-headed households where children have lost either one or both parents/caregivers to the disease. These children are then thrust into adult roles, often do not have access to food, education, love or care and yet have to provide this for younger siblings in their care.

More and more children are being orphaned or made vulnerable by the disease. Little is known about the exact levels of prevalence among children and what predisposes them to the infection. On the whole, children in the 2 to 14 age group are not fully included in much of the research currently underway. This makes this new report especially valuable.

Organisations working with children need information in order to plan their responses to the epidemic. We hope that this report will provide some of this information and assist all involved organisations and departments to effectively address the needs of our children.

A great thank you to all the researchers from the HSRC, MRC and CADRE for their commitment to this study! And special thanks to Drs Olive Shisana, Linda Richter and Leickness Simbayi for the role they played as chief investigators in managing this project.

Sibongile Mkhabela

Chief Executive Officer
Nelson Mandela Children's Fund

PREFACE



South Africa, like all of Africa, is dealing with the effects of the HIV/AIDS epidemic, particularly with what is called the third wave of the epidemic – its social impact. Children bear a considerable part of the brunt of the social impact of HIV and AIDS. It is thus imperative to have well-researched information that can underpin our responses to the plight of children.

The HSRC recognises that very little is known about HIV prevalence rates among children or about the risk factors that predispose them to becoming infected. Therefore we place great importance on investigating these factors with the hope that the impact of HIV/AIDS on children is firmly placed on the region's research and programme agenda. *The National Household HIV Prevalence and Risk Survey of South African Children* confirms our commitment to investigating not only HIV prevalence among children and what predisposes them to HIV infection, but also the effects of the epidemic on their care and support.

This study forms part of the larger *Nelson Mandela/HSRC Study of HIV/AIDS: South African National HIV Prevalence, Behavioural Risks and Mass Media Household Survey 2002*. The HSRC undertook the study in collaboration with several other research institutions. The results highlight three key issues:

- Prevalence;
- The socio-cultural context; and
- Interventions in relation to sexual behaviour and HIV infection.

As with the larger survey, the children's study was motivated by the need to monitor the national response to the HIV/AIDS epidemic. The study also serves as a baseline for monitoring future changes.

The main objective of the study was to determine HIV prevalence amongst South African children from 2 to 14 years of age. We also sought to identify social and community risk factors that predispose children to HIV infection, as well as the impact of the epidemic on children in terms of orphan status and child-headed households. Finally, the study examined children's knowledge of HIV and HIV prevention, their knowledge about sexual behaviour and HIV as well as their own patterns of sexual behaviour and changes in that behaviour.

As a research team we made sure that the children participating in the study were treated with the utmost respect, and that all field workers received ethical guidelines and training pertaining to the inclusion of children. Our findings show clearly that risk environments, levels of care and protection, as well as of knowledge and communication about sex and HIV influence a child's vulnerability to HIV infection.

We hope that this report will open the debate about how best to deal with the particular vulnerability of children and that organisations working with and for children will benefit from this information. We hope that the knowledge and recommendations made in this study will help prevent new infections among children.

We are therefore very pleased to present this report to the Nelson Mandela Children's Fund. We gratefully acknowledge the caregivers as well as the children whose participation in the study made this report possible.

We also take this opportunity to thank Dr Heather Brookes, who carried many of the responsibilities for the study.

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EXECUTIVE SUMMARY



1. *The National Household HIV Prevalence and Risk Survey of South African Children* forms part of the *Nelson Mandela/HSRC Study of HIV/AIDS: South African National HIV Prevalence, Behavioural Risks and Mass Media Household Survey 2002*. This report provides information on HIV prevalence, orphanhood, risk factors for HIV infection and knowledge of HIV/AIDS among South African children.
2. A total of 3 988 children aged 2 to 18 years participated in the survey. Caregivers of 2 138 children 2 to 11 years of age answered a questionnaire on the child's behalf. A total of 740 children 12 to 14 years of age directly answered a separate questionnaire. An additional 1 110 children between 15 and 18 years of age answered a youth questionnaire. Of the 3 988 children, 3 294 (82.6 per cent) provided a saliva specimen for HIV testing.
3. The results show HIV prevalence among children 2 to 18 years of age to be 5.4 per cent. Prevalence was nearly constant across age groups and did not vary significantly. There were insufficient numbers to compare prevalence across race groups. The prevalence was higher than expected. Further studies are necessary to verify this finding.
4. Maternal orphan rate is 3.3 per cent for children 2 to 18 years of age. One tenth of children have lost a parent/caregiver by 9 years of age and 15 per cent have lost a parent/caregiver by the age of 14 years. Among children 15 to 18 years, almost 25 per cent have lost at least one parent/caregiver. Children of African descent, children in poor households, and children living in informal settlements are most affected. Comparison with previous surveys on orphanhood show that orphanhood has not substantially increased since 1995. This finding suggests that South Africa has not yet experienced the full impact of HIV/AIDS on orphanhood and that there is still time to anticipate and prepare for an increase in orphanhood.
5. Three per cent of children 12 to 18 years of age said they were the head of the household. Overall, 0.5 per cent of households claimed to be headed by a child between 14 and 18 years of age. This finding is higher than the 0.25 per cent of households headed by children from the 1999 October Household Survey. However, South Africa may not yet have experienced the full impact of HIV/AIDS resulting in child-headed households.
6. Children under 12 years of age were not asked about sexual debut and experience. Very few children 12 to 14 years reported sexual activity. Sexual debut and experience among children 15 to 18 years of age can be found in the main report (Nelson Mandela/HSRC Study of HIV/AIDS, 2002).
7. This study identified three components of child vulnerability to HIV infection over and above vertical transmission. These were: risk environments, care and protection of children and knowledge and communication about sex and HIV/AIDS. For ethical and legal reasons, the study did not ask children about sexual abuse. Numbers were insufficient to compare HIV prevalence with these three components of child vulnerability.

8. Risk environments included levels of poverty, settlement type, businesses at home and exposure to alcohol/drug use.
 - Forty-five per cent of children live in homes where there is not enough money for food and clothes.
 - Of the households surveyed with at least one child 2 to 14 years of age, 12.7 per cent run businesses from home, mainly spaza shops and taverns.
 - Almost 32 per cent of children are exposed to someone in their home and neighbourhood who gets drunk once a month.

9. Measurement of care and protection of children in homes found that:
 - 1.3 per cent of children 2 to 11 years and 4.2 per cent of children 12 to 14 years had a caregiver younger than 18 years of age.
 - At least 5 per cent of children 2 to 11 years of age and over 10 per cent of children 12 to 14 years of age are not adequately monitored.
 - Examination of high risk practices where children are unprotected showed that almost 50 per cent of children 2 to 11 years of age and 75 per cent of children 12 to 14 years are sent out of the home alone on errands.
 - At least a third of children aged 2 to 11 and two thirds of children aged 12 to 14 years are allowed outside the home yard without adult supervision.
 - 15 per cent of children 2 to 11 years and almost 50 percent of children 12 to 14 years are left at home alone.
 - Almost a third of children 2 to 14 years of age are left at home in the care of a person 15 years or younger.

10. Measurement of care and protection in schools found that:
 - Travelling to and from school is a risk with the majority of children travelling to school on foot mostly accompanied by their peers with little adult protection.
 - Under half of children surveyed say educators watch children arrive and leave school.
 - A third of children say educators watch children during breaks and monitor toilets.
 - Two thirds of children report that educators ensure that no unauthorised person enters their school.
 - Two fifths of children report boys sexually harass girls.
 - 15 per cent of children report that male educators propose relationships with learners.

11. Investigation of knowledge and communication about HIV/AIDS found that:
 - About one tenth of caregivers of children 2 to 11 have discussed sex and HIV/AIDS with them. Almost a third have talked about sexual abuse. Caregivers are significantly more likely to discuss these topics with girls than with boys in their care. Two thirds of caregivers say they are comfortable talking about sex and HIV/AIDS with children in their care.
 - Just over 40 per cent of children 12 to 14 years of age report that their parents/caregivers have spoken to them about sex and HIV/AIDS. Half of all children in this age group report that their parents/caregivers have discussed sexual abuse with them. Again parents/caregivers are significantly more likely to have discussed these topics with girls. Seventy per cent of children 12 and over feel comfortable talking with a family member about sex and HIV/AIDS.

- Schools and educators are the most important source of information on HIV/AIDS for children 12 to 14 years of age followed by family, the main source being their mothers. Only 1.5 per cent and 1.2 per cent of children have learned about sex and sexual abuse from their fathers.
 - Among children 12 to 14 years of age, only half agree that HIV can be transmitted through unprotected vaginal sex.
 - Just over two thirds of children said that condoms protected a person from getting HIV/AIDS.
 - Correct knowledge of how HIV is transmitted and how to protect against contracting this disease was higher among children whose parents/caregivers had spoken to them about HIV/AIDS.
12. The study's conclusions and recommendations are as follows:
- Further prevalence studies of children should be conducted to verify the 5.6 per cent prevalence rate found in the main study.
 - South Africa has not yet felt the full impact of HIV/AIDS on orphanhood and child-headed households. There is still time to prepare for this impact.
 - Further work should find ways of assessing orphanhood and child-headed households due to HIV/AIDS.
 - Poverty and exposure to alcohol are high for South African children and create an environment where children may be at considerable risk of sexual abuse and consequently of HIV infection.
 - Care and protection of children at home and at school is not adequate and interventions where communities and schools work together to protect children are needed.
 - Correct knowledge on HIV/AIDS is deficient and communication on sexual matters is still inadequate particularly for boys and by fathers. More support and interventions to improve knowledge and communication are needed.
13. This study is the first national HIV prevalence study of children. The findings presented here are an important contribution to establishing the current status and conditions of children relating to the impact of HIV/AIDS. However, more work is needed to establish the proportion of HIV infection due to vertical transmission, nosomical factors, sexual abuse and sexual behaviour in children.



ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
ANRS	Agence Nationale de Recherche sur la Sida
CI	Confidence Interval
DOH	Department of Health
EA	Enumerator Area
FCS	Family Violence, Child Protection and Sexual Offences Unit
FDA	Food and Drug Administration
FHI	Family Health International
FS	Free State Province
GP	Gauteng Province
GPS	Global Positioning System
HIV	Human Immunodeficiency Virus
HSRC	Human Sciences Research Council
KZN	KwaZulu-Natal Province
LP	Limpopo Province
MEDUNSA	Medical University of South Africa
MP	Mpumalanga Province
MRC	Medical Research Council
NC	Northern Cape Province
NMCF	The Nelson Mandela Children's Fund
NMF	The Nelson Mandela Foundation
NW	North West Province
OHS	October Household Survey
PCR	Polymerase Chain Reaction
PSU	Primary Sampling Unit
SADHS	South African Demographic and Health Survey
SOP	Standard Operating Procedure
SPSS	Statistical Package for the Social Sciences
Stats SA	Statistics South Africa
VCT	Voluntary Counselling and Testing
VP	Visiting Point
WC	Western Cape Province
WHO	World Health Organisation

I. INTRODUCTION



The National Household HIV Prevalence and Risk Survey of South African Children forms part of the *Nelson Mandela/HSRC Study of HIV/AIDS: South African National HIV Prevalence, Behavioural Risks and Mass Media Household Survey 2002* (HSRC 2002). No survey information on prevalence among children has previously been available despite high levels of vertically transmitted infection of infants as well as high levels of sexual abuse of children. The core study report, released in 2002, included preliminary findings on prevalence among children, orphan status and child-headed households. This report provides a more detailed report on HIV prevalence and risk factors among South African children.

1.1 HIV/AIDS in South Africa

Since the first case of Acquired Immune Deficiency Syndrome (AIDS) was recorded and the Human Immunodeficiency Virus Type 1 (HIV) was identified as the causative agent of AIDS, the HIV/AIDS epidemic has spread at an alarming rate throughout the world, particularly in sub-Saharan Africa. UNAIDS (2002) estimates that, to date, 29.4 million people are living with HIV in this region and that approximately 3.5 million new infections have occurred in 2002. Ten million young people between the age of 15 and 24 and approximately 3.5 million children under the age of 15 are currently living with HIV.

Estimates of HIV prevalence in South Africa have relied on the testing of pregnant women attending public antenatal clinics. Antenatal data has also been the source of information on trends in HIV infection over time. However, the use of antenatal data to estimate national prevalence has limitations. It draws conclusions from tests conducted amongst a select group, namely sexually active women between 15 and 49 years of age who use public health services in the designated surveillance areas. Thus, these estimates do not include tests conducted on men, younger and older age groups, those who are not sexually active, and those who are using contraception to prevent pregnancy. Consequently, estimates based on antenatal data may lead to over-estimations of HIV prevalence as well as to potential under-estimations, because some South African studies have shown that HIV infection lowers fertility (Moultrie & Timaeus, 2002). These limitations are taken into account when estimating general population prevalence, but the adjustments require several assumptions and references to other data and are no substitute for population surveys.

Large-scale population-based national surveys of behavioural and social determinants of HIV/AIDS are summarised in: the *South African Health Inequalities Survey* (SAHIS, 1994), the *South Africa's Demographic and Health Survey* (Department of Health, 1998), and the *Human Sciences Research Council's surveys* (1997, 1999, 2001). Further discussion of these surveys can be found in the *Nelson Mandela/HSRC Study of HIV/AIDS 2002*.

Other studies on prevalence have been done in Zambia, Zimbabwe, Zanzibar and Mali.

The estimates for Zambia and South Africa were considerably lower than the published UNAIDS/WHO estimates, e.g. for Zambia around 16 per cent versus 21.5 per cent, for South Africa around 15 per cent versus 20 per cent. The results for Zimbabwe are not directly comparable, since the age range in the survey was limited to the age range 15 to 29 years. For countries with relatively low prevalence (Zanzibar, Mali), there was not much discrepancy with published surveillance-based estimate (UNAIDS, meeting, 2003).

Despite a growing body of studies on prevalence, there is still a dearth of national-level research that includes children. Consequently, we have little knowledge about prevalence among children and the socio-cultural risk factors which may be associated with infection.

1.2 Rationale and aims of the main study

Accurate information on national prevalence, the socio-cultural context within which the epidemic occurs and the impact of interventions, is key to providing an effective response to the HIV/AIDS epidemic. For this reason, the Nelson Mandela Children's Fund (NMCF) and the Nelson Mandela Foundation (NMF) commissioned the Human Sciences Research Council to conduct South Africa's first national HIV prevalence, behavioural risks and mass media survey (Nelson Mandela/HSRC Study of HIV/AIDS, 2002) to:

- Identify prevalent risk factors that predispose South Africans to HIV infection;
- Determine HIV prevalence in the South African population using anonymous, but data-linked HIV saliva tests;
- Combine the investigation of risk factors with biological measures to determine the association between the two;
- Model the prevalence data and forecast probable infection levels for the next ten years;
- Identify the social, economic, political, structural and cultural contexts within which certain behaviour occurs, identify obstacles to risk reduction, and examine the extent to which current mass media awareness and educational efforts take these factors into account;
- Determine the extent to which current prevention, educational and awareness programmes and campaigns reach all sectors of South African society, including the most vulnerable groups in the population;
- Determine whether and by whom media messages are accepted and understood.

1.3 Rationale and aims of the children's study

At a consultation meeting organised by the Nelson Mandela Children's Fund and the Nelson Mandela Foundation, held on 5 December 2001 in Johannesburg (referred to as *Parktonian II*, because like the first meeting, it was held at the Parktonian Hotel in Johannesburg), the delegates identified the importance of including children in the Nelson Mandela/HSRC survey. It was emphasised that in order to obtain true prevalence estimates of HIV rates in South Africa, the Nelson Mandela/HSRC survey should also include children.

Children are exposed to HIV infection through two main routes: vertically through parent-to-child transmission, and through sexual abuse or premature sexual activity. It has also been recently suggested that unsafe medical practices might be a significant alternative route of transmission, especially among children subjected to immunisation campaigns (Gisselquist *et al.*, 2002).

Although a considerable corpus of knowledge has developed around vertical transmission, very little is known about HIV infection among children as a result of sexual abuse. Given the prevalence rates of HIV infection among women of child-bearing age

(who may pass the infection to their children) as well as sexual abuse of children (reliable prevalence rates for children in South Africa are not available, Richter, Dawes & Higson-Smith, 2004), it is possible that HIV infection rates in children under 14 years of age are considerably higher than previously expected.

1.3.1 Vertical transmission

It is estimated that 91 per cent of the global HIV infections in children and that 94 per cent of the HIV-related child deaths occur in Africa (UNAIDS Report, 1999). Since the start of the epidemic, nearly 2.9 million African children have died of AIDS-related diseases (Akukwe, 1999). In South Africa, it is projected that AIDS will account for a 100 per cent increase in child mortality from an anticipated 48.5 deaths (without AIDS) to almost 100 deaths (including AIDS) per 1 000 children in 2010 (UNDP, 1998). UNAIDS (2000), working closely with the South African government, estimated that, at the end of 1999, 95 000 children were living with HIV/AIDS in South Africa. The number of new infections in children was estimated at approximately 70 000 in 2000.

Around one third of infants born to HIV-positive mothers are infected with HIV. Infection can occur over a prolonged period, from pregnancy to delivery and during breastfeeding. According to Smart (2000), the majority of infected children will show signs of HIV disease or AIDS in the first year of life and half of them will die by the end of the second year. However, 25 per cent of infected children will survive to five years and, with good care, this figure may increase.

1.3.2 Sexual abuse and premature sexual activity

A glaring information gap exists about HIV infection in the age range of 5 to 14 years. Information about sexual activity provides an initial framework within which HIV infection in this age range can be examined. Statistics on child sexual abuse and teenage pregnancies provide an additional source of information.

Two studies have reported the average age at first intercourse to be 13 years for males and 15 years for females among the rural youth, and 14 years for males and 16 years for females among the urban youth (Buga, Amoko & Ncayiyana, 1996; Richter, 1996, 1997). A study of high school students in the Cape Peninsula found that the age at first sexual intercourse averaged at 15 years for girls and 14 years for boys, although there was a large individual variability (Flisher *et al.*, 1992). The loveLife South African National Youth Survey (2000) reported that 31 per cent of youth 17 years and younger have had sexual intercourse. Of this sexually experienced group, 31 per cent have had this experience before the age of 14 years. Estimates based on the 1996 Demographic and Health Survey (DOH 1998) suggest that, by age 14 years, about 3 per cent of young people have had sex.

Cases of sexual assault and rape are another source of information on the exposure of children to the risk of sexual transmission of HIV infection. At the end of 2002, more than 31 000 cases of rape and sexual assault of young people under the age of 17 years were reported to the South African Police. It is clear, of course, that a large number of cases are unreported. According to more detailed statistics provided by the Family Violence, Child Protection and Sexual Offences Unit in Johannesburg, 24 per cent of raped children are infants, toddlers and primary school children (Neethling & Higson-Smith, 2003).

Data on pregnancy rates from Census 1996 indicate that (of all women aged 13 to 25 years, who have given birth to at least one child) 0.7 per cent have given birth to a child at 12, 1 per cent at 13, 1.3 per cent at 14 and 3 per cent at 15 years of age.

The available data on possible infection in children, arising both as a result of vertical transmission and sexual abuse, justify a special focus on children in the Nelson Mandela/HSRC study on HIV/AIDS. In addition to testing children younger than 15 years of age, the SABSSM survey also aimed to determine the orphan status of the children tested, and the number of children who reported that they were the heads of a household.

1.3.3 HIV transmission through healthcare

A recent review by Gisselquist *et al.* (2002) suggests that vertical transmission does not fully account for prevalence rates among children, particularly in Africa. A general consensus among AIDS experts is that HIV transmission occurs largely through heterosexual contact, and that only 2 per cent of transmission takes place as a result of injections and other medical procedures. However, the WHO estimates that 5 per cent of infections may be due to unsterile needles. Gisselquist *et al.* (2002) suggest that these estimates have ignored evidence in the 1980's of 'non-trivial' levels of HIV transmission among African children associated with healthcare practices. Examining a number of studies from different African countries, Gisselquist concludes that 'a significant proportion of paediatric HIV in Africa – as much as a fifth or more in many studies – has been acquired through healthcare rather than through vertical transmission from mothers' (Gisselquist *et al.* 2002: 659). This review came out too late for this study to include healthcare procedures as an environmental risk. Nevertheless, HIV transmission through healthcare needs to be considered as a possible explanation for some of the current study's results. Further research in this area is clearly important (the HSRC has developed a protocol to investigate this matter further in the Free State).

1.3.4 Child risk for HIV infection

Vulnerability to HIV infection is conceptualised in this study in terms of risk exposure at the social and individual level (Rutter, 1995). In children as in adults, risk occurs as a result of exposure to infection or a lack of protection from infection. In the case of the vertically infected child, the infant is infected as a result of exposure to the virus and a lack of protection from the virus during pregnancy, delivery and early feeding. In the case of children infected through sexual abuse or premature sexual activity, HIV infection occurs as a result of exposure to HIV infected individuals and a lack of protection of the child from abusive individuals.

1.3.5 Aims

The aims of the child study of the SABSSM survey were to:

- Determine HIV prevalence among children 2 to 14 years of age in South Africa;*
- Identify social and community risk factors that predispose children to HIV infection;
- Examine exposure to risk factors and behaviour in relation to social, economic and cultural contexts;

* Limited numbers did not allow conclusions to be drawn along certain parameters

- Link the environmental and personal risk factors with biological measures to determine the association between the two;*
- Determine the impact of the HIV/AIDS epidemic on children in terms of orphan status and child-headed households;
- Determine patterns of sexual behaviour, HIV prevention and behavioural change among children;*
- Determine levels of knowledge, sources of knowledge and communication about HIV/AIDS among caregivers and children.

This report presents the preliminary results of these aims. More extensive analysis will be performed later.

1.4 Conceptual framework

The conceptual framework which informed the main SABSSM study is the second-generation surveillance system, designed by the World Health Organisation (WHO), UNAIDS and Family Health International (FHI). These organisations have developed surveys of 'knowledge-attitudes-beliefs and practices' in relation to sexual behaviours and HIV infection over the past 15 years.

Most children will be infected through vertical transmission. However, sexual abuse and the early onset of sexual activity will also contribute to HIV prevalence among children. The social environment contributes to levels of vulnerability to HIV infection.

Consequently, this study has adapted the above conceptual framework to:

- Collect and analyse behavioural information to determine children at risk of getting infected, and to describe which behaviours and/or conditions need to be modified as a basis for designing interventions to prevent new infections;
- Generate data to track changes in sexual behaviour over time among children both in terms of gender and race as well as by province for the purpose of monitoring the HIV/AIDS epidemic;
- Obtain behavioural data necessary to understand changes in HIV prevalence in South Africa among children; and
- Track knowledge, attitudes and practices related to HIV/AIDS and the risk of infection in children.

* Limited numbers did not allow conclusions to be drawn along certain parameters

2. METHODS



This section describes the study sample, sampling procedure, weighting of the sample, questionnaire development, selection of HIV testing methods, ethical considerations, pilot study, data collection methods, quality control, data management and analysis, and strengths and limitations of the study. This section draws on the main report of the Nelson Mandela/HSRC Study of HIV/AIDS of which the national survey of children is a part. (Refer to the main report of the Nelson Mandela/HSRC Study of HIV/AIDS for further details.)

2.1 Study sample

The survey targeted 14 450 potential participants comprising 4 001 children (2 to 14 years of age), 3 720 youths (15 to 24 years of age), and 6 729 adults (25+ years of age). The sample was designed to provide results by province, geographic location and race. From experience with previous HSRC surveys and for statistical validation, it is necessary to obtain a minimum of 1 200 households per race group. The sample size therefore included 1 200 Indian households, 1 800 coloured households, 2 200 white households and 4 800 African households, making a total of 10 000 households.

The field work team contacted 13 518 (93.6 per cent of potential respondents) individuals. Logistical constraints prevented the field team from reaching the remaining 6.4 per cent. Of the 13 518 individuals contacted, 9 963 (73.7 per cent) agreed to be interviewed and 8 840 (65.4 per cent) agreed to provide a saliva specimen for an HIV test.

A total of 3 988 children aged 2 to 18 years participated in the survey. Children under 2 years of age were excluded from the study because children younger than this may carry their mother's antibodies to HIV and thus test positive on ELISA HIV tests even when they are actually HIV negative. To test accurately for HIV in children under 2 years of age, it is necessary to use nuclear amplification technology tests, such as the Polymerase Chain Reaction (PCR) test. This type of test is too expensive for use in a national community-based survey. Children under 2 years of age were also excluded because they cannot reliably produce a saliva sample.

Caregivers of 2 138 children 2 to 11 years of age answered a questionnaire on the child's behalf for reasons of developmental and mental capacity as well as for ethical considerations. Seven hundred and forty children 12 to 14 years of age answered a separate questionnaire directly during an interview while an additional 1 110 children, 15 to 18 years of age, answered a youth questionnaire. Of the 3 988 children from whom questionnaire data were obtained, 3 294 (82.6 per cent) provided a saliva specimen for HIV testing. Questionnaire and HIV-testing data from children of 15 to 18 years of age was included where possible in the analysis to give a comprehensive picture of HIV/AIDS in children and youth.

Table 1 on page 8 provides a breakdown of the number of child respondents by age and gender.

2.2 Sampling

The SABSSM study used the HSRC's Master Sample (HSRC, 2002) comprising a probability sample of census enumeration areas throughout South Africa representative of settlement type, provincial and racial diversity. The Master Sample was designed for use in repeated

Table 1: Number of child respondents by age and gender

Age in years	Male	Percentage	Female	Percentage	Total	Percentage
2	100	5.0	90	4.5	190	4.8
3	122	6.1	108	5.4	230	5.8
4	103	5.2	127	6.4	230	5.8
5	118	5.9	105	5.3	223	5.6
6	108	5.4	107	5.4	215	5.4
7	106	5.3	94	4.7	200	5.0
8	116	5.8	111	5.6	227	5.7
9	114	5.7	92	4.6	206	5.2
10	122	6.1	102	5.1	224	5.6
11	83	4.2	110	5.5	193	4.8
12	114	5.7	126	6.3	240	6.0
13	119	6.0	136	6.8	255	6.4
14	126	6.3	119	6.0	245	6.1
15	103	5.2	133	6.7	236	5.9
16	156	7.8	134	6.7	290	7.3
17	133	6.7	152	7.6	285	7.1
18	149	7.5	150	7.5	299	7.5
Total	1 992	100.0	1 996	100.0	3 988	100.0

household surveys. The design of the Master Sample uses the 2001 Enumerator Areas (EAs) from Statistics South Africa (Stats SA). The EAs are the Primary Sampling Units (PSUs), consisting of about 100 households. The target population is the general population, but excludes people in special institutions, such as hospitals, military camps, old age homes, schools and university hostels.

Stratification by province and locality type (geotype) determined selection of EAs. The four main locality types for the 2001 census are urban formal, urban informal, rural formal (including commercial farms) and tribal authority areas (rural areas). Race was a third stratification level applied only to formal urban areas.

Within each EA, the Master Sample identifies the visiting points (VPs), i.e. a separate (non-vacant) residential stand, address, structure, flat in a block of flats, or homestead. A cluster of 11 VPs was systematically selected within each EA using aerial photography. On the first visit to each VP, field workers listed all household residents. Before the second visit, eligible respondents were randomly selected in the following three age groups: 2 to 14, 15 to 24 and 25 years of age and older. During the second visit, the field workers (retired or unemployed professional nurses) implemented the main survey.

2. METHODS

No respondent substitutions were allowed. (The main report gives further details on sampling estimates, the number of EAs in each province and of each race group according to locality or geotype (Nelson Mandela/HSRC Study of HIV/AIDS, 2002:13–15)).

2.3 Weighting of the sample

The main report provides details of the steps undertaken to weight the survey data (see Nelson Mandela/HSRC Study of HIV/AIDS, 2002:16–18).

2.4 Questionnaire development

Questionnaires were developed for adults (25+ years of age), for youth (15 to 18 years of age), for children (12 to 14 years of age) and for caregivers of children 2 to 11 years of age. A core set of questions was included in all four age-based questionnaires. Details of the adult and youth questionnaire can be found in the main report (see Nelson Mandela/HSRC Study of HIV/AIDS, 2002:19).

Most international HIV/AIDS behavioural surveys have targeted the following age cohorts: adults 25 to 49 and youth 15 to 24 years of age. For purposes of comparison, the SABSSM survey for adults and youth developed questionnaires for the same age cohorts. The subsequent decision to include children, 2 to 14 years of age, in the survey made it necessary to develop an additional questionnaire for children under 15 years of age. After due consideration of both ethical (Bruzzese & Fisher, 2003; Greig & Taylor, 1999) and logistical issues related to the inclusion of children in research, a decision was made to develop two separate questionnaires. A questionnaire for children 12 to 14 years of age was designed for self-reported responses to an administered questionnaire. Filter questions were inserted so that children who had no sexual experience were not asked questions about sexual partnerships and so on. A separate questionnaire was developed for the caregivers of children 2 to 11 years of age, because the latter were judged to be too young to reliably answer a questionnaire and to respond directly to questions about sexual experience.

These questionnaires were developed in conjunction with the preliminary household demographic questionnaire as well as the adult and youth questionnaires.

There is little information as yet on indicators of infection in children; nonetheless, existing literature suggests that the following areas may be significant in defining indicators:

- Risk for children of sexual abuse;
- Sexual debut and pregnancy in children;
- Levels of knowledge about sex, sexual abuse and HIV;
- Media impact on awareness and knowledge of HIV.

Both the child and the caregiver questionnaires covered:

- Demographic characteristics including age, sex, race, language group, education level, school attendance, religion, orphan status and economic status;
- Knowledge, communication and sources of information about sex, sexual abuse and HIV/AIDS;

- Media impact on awareness and knowledge of HIV/AIDS;
- Experience of HIV/AIDS (having the disease or knowing someone who is living with HIV/AIDS);
- Risk environments including housing type, businesses at home or in the neighbourhood, exposure to drugs and alcohol, sleeping arrangements, levels of care, monitoring and supervision at home, risk at school, and on the way to and from school;
- Circumcision and virginity testing;
- Hospitalisation history and health status.

In common with the youth and adult questionnaires, the 12 to 14 year old child questionnaire included questions about sexual experience, sexual debut, sexual behaviour, number of partners, condom use, role of drugs and alcohol, communication with parents/caregivers about sex and sexual abuse, and attitudes to gender roles within relationships.

The measures included in the caregiver and child questionnaires are listed in Table 2.

Professional translators translated the English questionnaires into eight other South African languages: Afrikaans, isiZulu, isiXhosa, Sepedi, Sesotho, Setswana, Tshivenda and Xitsonga. In translating the questionnaires, an attempt was made to achieve colloquial forms. To ensure accuracy, independent mother-tongue speakers of these languages

Table 2: Areas of focus in the parent/caregiver and child questionnaires

Measures	Parents/caregiver of children aged 2–11 years	Children 12–14 years
1. Demographic – age, sex, race, geotype (urban/rural), province, marital status, education, language, religion, employment, source of income, adequacy of income, relationship to child, number of dependents	X	X
2. Orphan status	X	X
3. Child's home environment	X	X
4. Care and protection of child	X	X
5. Educating the child on life issues	X	
6. Sources of information on HIV/AIDS and media impact	X	X
7. Hospitalisation history and health status	X	X
8. Knowledge and communication about HIV/AIDS		X
9. Sexual experience and behaviour		X
10. Circumcision		X

Source: Nelson Mandela/HSRC Study of HIV/AIDS, 2002:22

compared the translated versions to the original English versions and adjustments were made to achieve equivalence of meaning.

2.5 Selection of specimen collection devices and HIV test kits

To increase participation rates, the SABSSM survey obtained specimens of oral transudate (contained in saliva) rather than of blood. There is currently only one oral transudate specimen collection device that is registered with the US Food and Drug Administration (US FDA), and that is the OraSure® HIV-1 Oral Specimen Collection Device. This device is licensed for use only with the Vironostika HIV Uni-Form II plus O testing kits. The sensitivity and specificity of the OraSure® device, when tested with the Vironostika ELIZA, is 99 per cent and also 99 per cent according to the manufacturers (Gallo *et al.*, 1997). All involved laboratories were prepared to use the Vironostika test kits and to do the testing according to the manufacturers guidelines. In order to standardise the testing procedures used in the study, the following Standard Operating Procedures (SOPs) were customised or specifically designed for the purposes of this study:

- SOPs for collecting, storing and transporting oral fluid using the OraSure® HIV-1 Oral Specimen Collection Device;
- SOPs for Vironostika HIV Uni-Form II plus O;
- SOPs for inter-Laboratory Quality Control for the study.

Further information on the selection of laboratories can be found in the main report (Nelson Mandela/HSRC Study of HIV/AIDS, 2002:23).

Obtaining saliva rather than blood samples was also considered the least invasive approach for testing children. There are a number of obvious advantages to collecting specimens for HIV testing by using a non-invasive specimen collection procedure, such as greater safety and increased participant compliance. A recent study that aimed to evaluate youth preferences for rapid and innovative human immunodeficiency virus antibody tests found that an oral collection device with a rapid saliva test was the most preferred test method (Peralta *et al.*, 2001).

Investigation of the reliability of saliva testing in previous studies has shown that it is sensitive and specific enough to use for surveillance purposes among adults and children. Earlier problems with low sensitivity have been corrected by using specialised collection devices that concentrate and stabilise the salivary-associated immunoglobulins (Gallo *et al.*, 1997). Modified ELISA and Western Blot assays have improved the sensitivities to between 97 and 100 per cent, and the specificities to between 98 and 100 per cent depending on the study. For example, the Oral Fluid Vironostika HIV-1 Micro Elisa System (Organon Teknika, Durham, NC) and the OraSure® HIV-1 Western Blot Kit (Epitope Inc., Beaverton, OR) have provided the correct result of triggered appropriate follow-up testing in 3 569 (>99 per cent) of 3 570 cases (Gallo *et al.*, 1997).

A study, designed to validate a method for salivary testing for HIV infection in children older than 12 months, found that specificity and sensitivity of salivary testing were both 100 per cent (from 331 specimens when compared to sera): 297 of 297 (95 per cent confidence interval 98.8 to 100 per cent) and 34 of 34 (95 per cent confidence interval 89.7 to 100 per cent) respectively (Tess *et al.*, 1996). The authors concluded that 'Salivary

testing provides an accurate and acceptable non-invasive method for assessing the HIV infection status of children born to infected mothers by using an IgG antibody capture enzyme-linked assay alone with a strategy of duplicate retesting of reactive specimens'.

2.6 Ethical considerations

The main study and the children's study followed the established principles regarding linked anonymous testing (see Centers for Disease Control website, <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr481a.1.htm>):

- The study informed participants about the purpose of the study and of giving a oral fluid sample;
- Participants had to give consent for participating in the study and for a sample to be taken;
- Referrals for 'voluntary counselling and testing' (VCT) were offered at the request of the participant.

The main report gives details of steps taken to maintain the highest ethical standards. All adults and youth who agreed to participate gave written, or if illiterate, verbal consent. Children between 2 and 11 years of age were required to assent to their participation in the study after the child's caregiver had given consent for the child's inclusion. Field workers received specific training to ensure consent procedures were correctly followed. To preserve anonymity, bar codes were used on questionnaires and oral fluid specimens, participants were not given their results preventing field workers from knowing their HIV status, and data was not analysed by smaller geographic unit. If participants wished to know their HIV status, field workers gave them a referral card to the nearest VCT site.

Research on children poses significant challenges. Age of consent and capacity to give consent, confidentiality, legal obligations to report abuse against children, and secondary trauma associated with the research are the main challenges which we encountered in this study.

Regarding age of consent, current and forthcoming legislation is contradictory. For example, a child of any age can consent to have an abortion without parental permission (Termination of Pregnancy Bill, 1996). However, in terms of the 'Child Care Act 1983', a person must be 18 years old to give consent to surgery, and 14 years old to consent to investigative procedures and non-invasive medical treatment.

The Child SABSSM research team convened a consultation with experts to consider the legal and ethical issues involved. Following the more conservative legislation and considering the well-being of children as paramount, the study adhered to the following:

- Any child 14 years and younger needed the written consent of their parent or caregiver;
- Children between the ages of 12 and 14 years were asked to give verbal consent;
- Children under age 12 were not considered capable of answering a questionnaire thus primary caregivers would answer a questionnaire on their behalf. Nonetheless, the children were required to assent to their participation;
- All children were asked for verbal consent to give an oral fluid sample.

2. METHODS

The possibility of field workers encountering cases of child abuse during their field work was also an important consideration. The issue of maintaining participant confidentiality, the impact on a child and his/her family if cases were to be reported, and mandatory reporting of child abuse in terms of the 'Child Care Act No. 74, 1983' were considered. In order to avoid mandatory reporting and consequently breaking confidentiality assurances, as well as secondary trauma to the child, the following procedures were adopted:

- There would be no questions about sexual abuse in the survey;
- Volunteered information about sexual abuse of a child would be handled on a case-by-case basis in consultation with the field work supervisors and the study's investigators;
- Details of the nearest social work offices and Child Protection Units were made available to each household if requested.

In order to ensure that field workers adhered to these ethical guidelines, the following measures were taken and are also outlined in the main report:

- A manual for the participants accompanied the questionnaires with a short introduction for each section stating what would be covered in the section, explaining why the questions were being asked, and assuring participants of the confidentiality of their responses;
- Training was provided for field workers and ethical guidelines were included in the training manual. Field workers received additional specific training on the management of children and how to deal with crises that might arise in the field;
- Supervisors monitored field worker procedures for obtaining consent, administering the questionnaire and handling participants.

Compensation for participation was given to each participating household. Details of the rationale and procedure for doing so are given in the main report of the Nelson Mandela/HSRC Study of HIV/AIDS (2002:25).

2.7 Pilot study

A pilot study was done in 13 EAs in Gauteng and North West province. The pilot study tested the Master Sample, the collection of household demographics at each visiting point, the sampling of participants, administration of questionnaires, and management and analysis of data. The results of the pilot study made it possible to refine the questions and to shorten the questionnaire; they also indicated that in order to obtain an adequate response rate, field work had to be conducted during evenings and on weekends (Nelson Mandela/HSRC Study of HIV/AIDS, 2002).

2.8 Data collection and quality control

Researchers collected data in two phases, which are outlined in detail in the main report of the Nelson Mandela/HSRC Study of HIV/AIDS (2002).

In brief, Phase I involved the creation of a Master Sample, notification of the households involved in the study, and the obtaining of consent along with basic demographic data from selected households. The Master Sample involved aerial photography to enumerate and sample visiting points. Notification of households took 4 months and involved 15

field work teams that matched the racial and language profile of participants in order to maximise the response rate. Field workers informed the heads of households about the study and provided written documentation as well as letters from the Nelson Mandela Foundation and the Nelson Mandela Children's Fund. If participants consented, field workers recorded basic demographic information, such as number of household members, ages, gender, race and location. The latter was identified by global positioning system (GPS) equipment in order to avoid using participants' addresses and thereby reducing the chances of identifying households.

Phase II involved the field work for the main study. Three participants in each household were randomly selected by computer provided that each household contained at least one child 14 years and younger, one person between 15 and 24 years of age and a person 25 years of age or older. A total of 171 recently retired nurses were divided into 34 teams, each led by a nurse supervisor, and underwent training to visit each household and conduct the study. (See 2.6 *Ethical considerations*, for details of training for handling child participants.) Each participant was interviewed in private after the field workers had obtained verbal or written consent. The nurses followed standard operating procedures for taking the oral specimens. The head of the household was paid R50 for participation in the study. (See details under 2.6 *Ethical considerations* above and in the main report, Nelson Mandela/HSRC Study of HIV/AIDS, under 2.7 *Compensation for participation* (2002:25)). Supervisors recorded the completion of questionnaires and oral specimens were collected using tracking sheets. Oral specimens were then sent directly to designated laboratories, while the completed questionnaires were sent to the HSRC in Pretoria for sorting, coding, data capturing, analysis and storage.

Quality control procedures were applied to Phases I and II of data collection. Research supervisors checked all steps taken to identify and record visiting points in Phase I. For Phase II, supervisors checked the quality and correctness of the recorded demographic information, the quality of data capturing and the completeness of field work kits. Quality control was also performed to assess the conduct and competence of the field workers, the completeness and accuracy of the questionnaires, the collection of oral fluid samples, the bar coding and laboratory tracking forms. (Further details can be found in the main report, Nelson Mandela/HSRC Study of HIV/AIDS (2002:28–29)).

2.9 Data management and analysis

Quality control procedures were applied to the captured data (see main report for details 2002:29). Datasets were then converted to Statistical Package for the Social Sciences (SPSS) and frequency distributions were run to check that all variables contained only values in the defined range. Where necessary, reference was made to the original questionnaires to correct any errors. After the datasets were edited, routines were written to calculate weights. Unweighted data were analysed using SPSS and SAS computer software. Weighted data were analysed using computer programmes able to take into account the weighting of individual responses according to sampling design in the computation of statistical univariate tests as well as multivariate analysis (STATA and SAS; Nelson Mandela/HSRC Study of HIV/AIDS, 2002).

2.10 Strengths and limitations of the study

2.10.1 Strengths

The main report highlights the major strengths of the study, which are also applicable to the children's study:

- The overall sample size (N=9 963) and the sample size of children (N=3 988) is large enough to allow for meaningful analyses of socio-behavioural determinants, mass media information and HIV test results.
- The study for adults, youth and children is based on a sampling approach that ensures representivity of the South African population at the specified levels. The main report states that 'The study used a multi-stage, stratified, cluster sampling approach to drawing EAs, visiting points and individual participants who were randomly selected' (2002:30). This means that the results are generalisable to the nation, provinces, children, youth and adults, and also to each of the four locality types (geotypes) of census enumeration areas: urban formal, urban informal, farm and tribal areas.
- Use of a Master Sample means that the survey can be repeated in the same household or EA, allowing changes in behaviour, knowledge, exposure to information and HIV status to be tracked for all age groups. This study thus serves as a baseline for future studies both in adults and children.
- This survey is the first in South Africa to simultaneously investigate the three key elements necessary for monitoring a national response to the HIV/AIDS epidemic: prevalence, socio-cultural context and interventions in relation to sexual behaviours and HIV infection; it thus serves as a baseline for monitoring future changes.
- This is the first national survey of children in relation to HIV prevalence and risk. We now have national data available on:
 - HIV prevalence in children 2 to 18 years of age
 - Child-headed households
 - Poverty levels among children
 - Exposure to risk environments for children
 - Care and protection of children at home and at school
 - Behavioural change in response to the epidemic
 - Children's exposure to information about HIV/AIDS
 - Children's knowledge about HIV/AIDS
 - Children's sources of information about HIV/AIDS
 - Patterns of communication in families and communities about HIV/AIDS
 - Health status of children including vaccinations
- The children's study also provides current information on orphan status allowing us to make comparisons with previous surveys and to determine to what extent and how rapidly orphan status may be increasing.

2.10.2 Limitations

Limitations inherent in cross-sectional studies

The main report of Nelson Mandela/HSRC Study of HIV/AIDS (2002) points out three major limitations to cross-sectional socio-behavioural surveys. These are:

- Determining causality is difficult, because such surveys measure exposure and outcomes simultaneously;
- Determining the temporal sequence of HIV infection and behavioural change is difficult, because such surveys do not measure incidence and change over time;

- Self-reported data are not only subject to recall bias, but also to social desirability bias; for example participants may tend to provide answers they consider socially acceptable especially regarding behaviour in the private intimate sphere, such as sexual and addictive behaviours.

Limitations specific to this study

The major limitation to both the main study and the children's study was the relatively low response rate, particularly among certain population groups, making it difficult to determine HIV prevalence in some sub-populations. In the children's study, for example, the high refusal rate particularly among Indian and white South Africans prevented reliable measurements for HIV prevalence among children in these race groups. This also precluded any correlation of HIV prevalence with specific variables such as socio-economic status or levels of exposure to high-risk environments among children.

The children's study has a number of other limitations, such as:

- Children younger than 2 years of age could not be included because they may carry their mothers' antibodies to HIV while they themselves may still be HIV negative. In such cases, the ELISA HIV test will indicate a false positive. Consequently, the study excludes a significant proportion of children who have acquired HIV through vertical transmission.
- Children could not be asked directly about sexual abuse for legal and ethical reasons. This limitation makes it impossible to determine the relationship between sexual abuse and HIV prevalence in children. Because it is mandatory to report instances of sexual abuse, the reporting of such disclosures would break the confidentiality guaranteed by the research project. Reporting of abuse may also exacerbate the child's situation and that of his or her family. In addition, the research project should not provoke secondary trauma among the participants, which may happen if an abused child has to answer questions about sexual abuse. (See 2.6 *Ethical considerations* for more details.)
- Children 2 to 11 years of age could not be questioned directly for competency and ethical reasons. The survey relies on the caregiver's accurate reporting and knowledge of the child's behaviour. Accuracy is uncertain when, for example, the caregiver gives information about how much the child knows about HIV/AIDS.

The use of three different questionnaires, one each for caregivers, children and youth, presented difficulties in obtaining comparable information on all variables across the full age range of 2 to 18 years. However, this approach was agreed upon at the beginning of the study to ensure that the questions could be adjusted within each age group to facilitate understanding.

3. RESULTS



A full report on the approaches used for testing the reliability and validity of the data, including the generalisability of the results, response bias, testing of reliability using re-interviews of a sub-sample, validity of prevalence estimations, and reliability of laboratory test results is presented in the main study (Nelson Mandela/HSRC Study of HIV/AIDS, 2002:33–45).

The reader should note that the results are presented with actual N's while percentages are weighted data.

3.1 HIV prevalence among children 2 to 18 years

The HIV prevalence by age and sex of the children, who agreed to be tested, is presented in Table 3. The results show that the HIV prevalence among children aged 2 to 18 years is between 5.4 per cent. The overall HIV prevalence is examined separately in the three age groups to determine the possible routes of transmission: sexual or vertical. The prevalence is found to be highest in the 2 to 9 year old group of children, some of which could be accounted for by vertical transmission. The confidence intervals of the three age groups overlap, which means that the differences between them are not statistically significant.

As Table 3 shows, girls aged 2 to 18 seem to have a slightly higher HIV prevalence than boys of the same age, however this difference is not statistically significant.

Note: Caution is warranted in interpreting these findings, because the sample sizes of these groups are small and the resultant confidence intervals large.

Boys aged 2 to 9 years seem to have a higher HIV prevalence than girls, but again the differences are small and not statistically significant. A lower prevalence was recorded for boys aged 10 to 14 years than for boys aged 2 to 9 and 15 to 18 years, although the

Table 3: HIV prevalence by age and sex of children, South Africa, 2002

	2–18 years old	2–9 years old	10–14 years old	15–18 years old
Total N	3 295	1 377	973	945
Prevalence (%)	5.4	6.2	4.7	5.0
CI (95)*	[4.1,7.1]	[4.2,9.0]	[2.5,8.7]	[3.2,7.6]
Sex				
Male N	1 650	714	474	462
Prevalence (%)	5.1	6.5	3.5	4.7
CI (95)	[3.6,7.1]	[3.9,10.6]	[1.9,6.4]	[2.4,9.0]
Female N	1 645	663	499	483
Prevalence (%)	5.7	5.8	5.9	5.3
CI (95)	[3.7,8.6]	[3.2,10.4]	[2.3,14.2]	[3.0,9.1]

*CI (95)= Confidence Intervals at 95 per cent levels
None of the differences are statistically significant

confidence intervals overlap to a large extent. For girls, a different pattern is observed with the HIV prevalence being similar across the three age groups. This finding will be discussed further below.

The numbers tested were insufficient to provide prevalence by race group. Tables 4 and 5 show figures for HIV prevalence by settlement type and perceived household situation.

Table 4: HIV prevalence among children, aged 2 to 18 years, by settlement type, South Africa, 2002

Settlement type	SE	N	Prevalence (%)
Urban formal	1.3	1 941	5.5
	CI (95)*		[3.444,8.593]
Urban informal	1.7	290	6.4
	CI (95)*		[3.688,10.73]
Tribal authority area	1.1	876	5.3
	CI (95)*		[3.491,8.019]
Rural formal	1.8	188	4.6
	CI (95)*		[2.112,9.563]
Total	0.8	3 295	5.4
	CI (95)*		[4.109,7.082]

*Confidence intervals at 95 per cent levels

Table 5: HIV prevalence among children, aged 2 to 18 years, by household situation, South Africa, 2002

Household situation	N	Prevalence (%)	CI (95)
Not enough money for basics, such as food and clothes	1 299	5.0	[3.427,7.368]
Enough money for food and clothes, but not for many other things	1 108	6.8	[4.176,10.78]
Enough money for most things, including luxuries	667	4.7	[2.716,8.013]
'Don't know'	221	2.1	[.8446,5.115]
Total	3 295	5.4	[4.109,7.082]

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3.1.1 Discussion on HIV prevalence among children

There has been some debate about the correct interpretation of the observed HIV prevalence ratio among children reported in the Nelson Mandela/HSRC Study of HIV/AIDS (2002). HIV prevalence turned out to be higher than expected and prevalence was nearly constant across the age range of children tested, with no significant differences between age groups. Assuming that HIV/AIDS progresses rapidly (from infection to death) in about half of the children infected through mother to child transmission (approximately 50 per cent are expected to die within 2 years) but more slowly in the other half, one can expect the prevalence curve to be U-shaped with infections increasing as children grow older and are exposed to sexual abuse and premature sexual activity. The results of this study do suggest a U-shaped curve, although not significant, in HIV infection for boys (see Table 3), the prevalence being 6.5 per cent for ages 2 to 9 years, 3.5 per cent for ages 10 to 14 years and 4.7 per cent for the 15 to 18 year age group. However, a U-shaped curve is not seen in girls, where prevalence is roughly the same in all three age groups. It is, however, difficult to draw firm conclusions from these results, because after division into sex and age groups, the numbers become small and the resultant confidence intervals large.

With no comparable data existing for South Africa, it is difficult to interpret or verify these prevalence data. Further studies are therefore necessary to confirm levels of HIV prevalence in children. Although some validation of oral fluid for testing serostatus in children has occurred (Tess *et al.*, 1996), further validation is necessary to confirm its reliability. If the prevalence levels reported in the HSRC study are correct, additional research is necessary to explain these findings. In particular, research will need to focus on the role of sexual abuse, on the incubation period for children and on nosocomial infections (health services acquired infections). A WHO model estimates that at least 5 per cent of all HIV infections may be due to unsterile needles. Gisselquist *et al.*, (2002) also argues that nosocomial infections are a significant factor in HIV transmission in Africa.

3.2 Orphans

The UNAIDS estimated that about 660 000 children in South Africa have become orphans due to AIDS (UNAIDS, 2002). UNAIDS defines an AIDS orphan as a child, aged 0 to 14 years, who has lost one or both parents to AIDS. This study could not estimate the exact percentage of orphans who have lost parents to AIDS, because no information on the cause of death of parents was collected. It is unlikely, however, that such information would have been accurately reported, because of the potential stigma involved for children whose parents died from an HIV/AIDS related illness.

In the present survey, we asked children aged 12 to 18 years and the guardians of children aged 2 to 11 years, whether their mother and father were still alive. Our findings in terms of orphanhood as well as the demographic characteristics of orphans in South Africa are presented in Table 6.

The results of the study show that the overall maternal orphan rate (including children who may have lost a father) is 3.3 per cent for children 2 to 18 years of age. The rate is high in the 15 to 18 year age group, followed closely by the 2 to 9 year olds. Free State has the highest maternal orphaned rate. The figures for children 2 to 14 years old, who

Table 6: Demographic characteristics of orphans in South Africa, 2002

	N	Mother and father died	Maternal orphans	Paternal orphans	Both parents alive (or don't know)	P value
Total	3 988	59	114	343	3 472	
Percentage		2.2	3.3	10.1	84.4	
Gender						P=0.83
Male	1 992	2.3	3.0	9.5	85.2	
Female	1 997	2.2	3.5	10.8	83.6	
Age of respondents						P<0.001
2–9 years old	1 721	0.5	3.6	6.5	89.4	
10–14 years old	1 157	3.5	2.2	10.8	83.6	
15–18 years old	1 110	3.9	4.0	16.1	76.0	
Province						P=0.003
WC	527	1.7	3.1	7.4	87.7	
EC	621	1.0	4.9	13.8	80.3	
NC	283	0.7	4.9	5.2	89.3	
FS	225	1.7	6.2	9.8	82.3	
KZN	818	5.2	3.3	13.2	78.3	
NW	282	0.3	1.3	10.3	88.1	
G	548	1.6	1.3	5.6	91.5	
M	265	1.7	2.7	6.0	89.6	
L	419	1.8	2.9	9.5	85.8	
Locality type						P=0.027
Urban formal	2 347	1.4	2.5	8.4	87.7	
Urban informal	343	4.7	4.3	9.2	81.8	
Tribal	1 067	2.7	3.6	12.2	81.4	
Rural formal	231	0.7	3.9	5.0	90.4	
Race groups						P=0.008
Africans	2 416	2.6	3.4	11.0	83.0	
White	278	0.2	2.2	4.9	92.7	
Coloured	851	1.0	3.3	5.6	90.1	
Indians	443	0.0	1.0	5.7	93.4	



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	N	Mother and father died	Maternal orphans	Paternal orphans	Both parents alive (or don't know)	P value
Household situation						P=0.009
Not enough money for basics, such as food & clothes	1 536	2.9	4.2	12.9	80.1	
Enough money for food & clothes, but not for many things	1 348	2.6	2.5	7.6	87.3	
Enough money for most things, including luxuries	1 104	0.3	2.4	8.4	88.9	

have lost a mother or father, are similar to those who lost their mother (1.9 per cent and 2.8 per cent of children) and/or father (9.5 per cent to 12.5 per cent) calculated from the 1995 October household survey conducted by Stats SA (Anderson, *et al.*, 2002). Comparing the rate of orphanhood in 1995 with the results of this study shows that the rate of orphanhood has not substantially increased, at least in the 2 to 14 year old age group.

The rate in orphanhood also did not vary by sex of the child. However, as expected, the likelihood of becoming an orphan increases with the age of the children. Table 7 shows that one tenth of children have lost a parent by the time they reached the age of 9 years, over 15 per cent have lost a parent by the age of 14, and in the 15 to 18 year age group, almost a quarter of all children have lost at least one parent.

When orphanhood was examined by province, the results show KwaZulu-Natal to have the highest proportion of children who have lost both parents. However, the numbers in this category (N=59) are small, hence they need to be treated with caution. The Free State has more maternal orphans than all other provinces, followed by the Northern Cape and Eastern Cape, while the numbers of paternal orphans are highest in the Eastern Cape and in KwaZulu-Natal (see Table 6).

Differences were also observed in orphanhood status by place of residence. Children living in urban informal settlements appeared more likely to have lost both parents or to be maternal orphans than children who live in rural or formal urban areas. Rates of paternal orphans were higher in tribal authority areas (see Table 6).

Table 7: Orphan status by three age cohorts, South Africa, 2002 (categories are not mutually exclusive)

Age	N	Both dead (%)	Mother dead, father alive (%)	Father dead (%)	At least one parent dead (%)	Both alive (%)
2-9	1 721	0.5	3.6	6.5	10.6	89.4
10-14	1 157	3.5	2.2	10.8	16.4	83.6
15-18	1 110	3.9	4.0	16.1	24.0	76.0

Note: Categories are not mutually exclusive

Table 6 also shows that African children were found to be more likely, than children of other races, to have been orphaned due to the death of both parents. They were also more likely to have lost their fathers than their mothers. Children living in poor households were more likely to have lost both parents than those from well-to-do households.

3.2.1 HIV prevalence by orphan status

Due to the small sample size of orphans, it was not possible to analyse the data by age cohort as was done for HIV prevalence in all children. Table 8 presents the findings on HIV prevalence by orphan status.

Table 8: HIV prevalence among children by orphan status, aged 2 to 18 years (HIV tested population), South Africa, 2002

	N	HIV prevalence (%)	P values
Total	3 295	5.4	
	CI (95)	[4.1,7.1]	
Orphanhood			P=0.276
Mother and father dead	50	12.7	
	CI (95)	[4.8,29.7]	
Mother dead	105	6.3	
	CI (95)	[2.5,15.4]	
Father dead	294	4.5	
	CI (95)	[2.1,9.2]	
Both parents alive (or 'don't know')	2 846	5.3	
	CI (95)	[3.8,7.2]	
Orphanhood			P=0.644
One parent dead (mother or father)	449	6.1	
	CI (95)	[3.8, 7.2]	
Both parents alive (or dont know)	2 846	5.3	
	CI (95)	[3.8,7.2]	

The results show that the prevalence of HIV among orphans who have lost both parents is highest, followed by maternal orphans, non-orphans and paternal orphans. Compared to all other children, those who lost both parents had the highest observed HIV prevalence, although the difference was not statistically significant.

3.2.2 Discussion

The finding that orphanhood has not substantially increased since 1995 suggests that South Africa has not yet felt the full impact of AIDS on orphanhood. Given the data

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demonstrating that African children, children in poor households, children living in informal settlements and older children are most affected, relevant institutions should focus on these groups and explore the most constructive ways of dealing with orphanhood. Developing community-based support for orphans within the communities should be the main focus given the known negative impact of institutionalisation on children (Frank *et al.*, 1996).

Data on children not living with a biological parent also need to be investigated. Anderson *et al.* (2002) show that between 1995 and 1998 fosterage increased from 6.7 per cent (OHS Survey) to 15 per cent (SADHS Survey). The reasons for this increase are not clear. Child migration between families and localities, other adaptations in coping with economic constraints on childcare, and the burden of orphanhood must be further investigated. Future measuring methods must be developed to determine what proportion of orphanhood can be attributed to AIDS. These methods should be designed to avoid stigmatisation of the children.

3.3 Child-headed households

Children, aged 12 to 18 years, were asked who the head of their household. Three per cent of these children responded that they themselves were heads of their household. In further analysing the data we suggest that this figure is not a percentage of all households, because not all households have children of this age group. Also, some of the children sampled were from the same household. After correcting for these factors, the response to this question suggests that about 1.5 per cent of all households are headed by children aged 12 to 18 years. The visiting point questionnaire also contained a question relating to household headship. In response to this question, 0.5 per cent of households responded that they were headed by a child between the age of 14 and 18 years. This discrepancy suggests that some of the children, who lived with adults, considered themselves to be the head of the household when they were asked in private. While further examination of these data is required, less than 1 per cent of households appear to have a child head. However, this result is still higher than the results from the 1999 October Household Survey, which yields an estimate of 0.25 per cent of households being headed by children.

3.3.1 Discussion

As with orphan status, South Africa is not yet experiencing the full impact of AIDS on the number of households headed by children. Thus, there is still some time to anticipate and prepare for a substantial increase. Further research on causes for child-headed households, particularly the proportion of child-headed households due to AIDS, is needed.

3.4 Sexual debut and sexual experience

Children under 12 years of age were not asked about their age of sexual debut and sexual experience. Very few children in the 12 to 14 year age group reported that they had engaged in sex. Information about the sexual debut and experience of youth, aged 15 to 24 years, can be found in the main report (Nelson Mandela/HSRC Study of HIV/AIDS, 2002).

3.5 Risk factors and risk environments for children

Children are at risk of contracting HIV/AIDS through a number of sources. Besides vertical transmission from mother to child in pregnancy and early infancy, many South African children face the risk of sexual abuse within homes, schools and communities. Without appropriate education on sexual matters including STI's, early sexual experience, whether coerced or not, increases the risk of children for contracting HIV. Also, the role of children in caring for parents with HIV/AIDS-related diseases requires investigation, because few universal precautions against infections may be taken within the home setting. If this is the case, HIV infection in children may increase.

The present study identified three components of child vulnerability to HIV infection:

- Risk environments;
- Care and protection of children; and
- Knowledge and communication about sex and HIV/AIDS.

For ethical and legal reasons as well as to avoid the risk of secondary trauma to children, the questionnaires to caregivers of children, aged 2 to 11, and to children, aged 12 to 14 years, did not ask directly about sexual abuse (see 2.6 *Ethical considerations*). The numbers were also insufficient to reliably measure child HIV prevalence against risk environments, care/protection and knowledge/communication. However, we are able to provide a picture of the proportion of children at risk in different environments and gain some insight about their knowledge and communication about sex and HIV/AIDS.

3.5.1 Risk environments

Poverty, certain settlement types, such as informal settlements, businesses run from home and exposure to alcohol and/or drugs all constitute increased risk for children because of decreased protection and increased exposure to potential abuse. Table 9 shows the self-reported household situation levels for children 2 to 18 years of age.

Forty-five per cent of all children in the survey live in homes where there is not enough money for basics such as food and clothes. When comparing African children with children of other race groups, we see that African children are the most vulnerable in terms of poverty, with half of them lacking basic resources. However, the percentages for race groups other than African should be treated with caution because the numbers are small.

Table 9: Household situation by race among children, aged 2 to 18 years, South Africa, 2002

Race	N	Not enough money for basics (%)	Enough money for basics, but not for many other things (%)	Enough money for most things, including luxuries (%)	Don't know (%)
African	2 416	50.3	35.7	8.0	6.0
White	278	6.4	15.4	71.0	7.2
Coloured	851	27.6	40.8	22.7	8.9
Indian	443	10.1	28.0	57.4	4.6
Total	3 988	45.1	34.7	13.9	6.3

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From the main report of the Nelson Mandela/HSRC Study of HIV/AIDS (2002), HIV prevalence is highest among adults in urban informal areas. These areas are also prone to numerous social problems including violence and sexual abuse. Children in these areas may therefore be more vulnerable. Table 10 shows the proportion of children living in different settlement types by household situation. The largest proportion of children, who do not have enough resources for basics, live in informal settlements.

Table 10: Household situation by settlement type of children, aged 2 to 18 years, South Africa, 2002

Settlement type	N	Not enough money for basics (%)	Enough money for basics, but not for many other things (%)	Enough money for most things, including luxuries (%)	Don't know (%)
Urban formal	2 347	32.5	35.6	26.4	5.5
Urban informal	343	63.4	26.9	2.5	7.2
Tribal authority areas	1 067	52.0	35.1	6.4	6.6
Rural formal	231	47.4	35.4	9.3	7.9
Total	3 988	45.1	34.7	13.9	6.3

The environment within and around the home can also be a risk to children. Of the households surveyed, with at least one child aged 2 to 14 years, 12.7 per cent run businesses from home, the majority of these being informal spaza shops and taverns.

Children and caregivers were also asked about exposure of children to drug and alcohol abuse in homes and in neighbourhoods. A small proportion of children (4.1 per cent) 2 to 14 years of age are exposed to someone within their home or neighbourhood who uses drugs at least once a month. A much larger percentage of children (31.9 per cent) are exposed to someone in their home or neighbourhood who gets drunk at least once a month. Among caregivers of children 2 to 11 years of age, 15.8 per cent reported to ever using alcohol and 0.3 per cent to ever using drugs. Among children 12 to 18 years of age, 6.3 per cent reported to ever using alcohol and 0.8 per cent reported to ever having used drugs.

3.5.2 Care and protection

Care and protection of children both at home and at school are key to preventing sexual abuse and HIV transmission. Several focused studies by the HSRC and other organisations show that protection within schools and communities is not adequate (Brookes & Richter, 2001, Higson-Smith, Richter & Bedell, 2002, Human Rights Watch, 2001). The present study is the first national study that measured levels of care and protection in homes,

schools and communities. Again, the numbers were insufficient to be able to measure HIV prevalence under varying conditions of care and protection. However, we are able to report the extent to which children are being protected at home and at school.

Caregivers are key to children's care and protection. Depending on the person taking care of a child and how the care is provided, some level of protection is ensured. In this study, the vast majority of children have a biological parent as their primary caregiver, followed by a grandparent. Table 11 shows that 4.6 per cent of children have a primary caregiver that is a non-family member.

Table 11: Primary caregivers of children, aged 2 to 14 years, South Africa, 2002

Caregiver	(N = 2 878)	Primary caregiver (%)
Biological parent	1 829	65.3
Grandparent	580	20.3
Sibling	138	4.2
Other family member	170	5.4
Non-family member	156	4.6
Nobody	5	0.2

The age of the caregiver may also be an important factor in the protection of children. Table 12 shows the percentage of children in the care of a caregiver aged 18 years and under as well as of caregivers aged 60 years and over.

Table 12: Age of caregivers of children, aged 2 to 11 and 12 to 14 years, South Africa, 2002

Age of caregiver	Age of child	
	2–11 (N=2 138)	12–14 (N=740)*
≤ 18	1.3 (%)	4.2 (%)
19–60	79.9 (%)	82.7 (%)
< 60	18.8 (%)	13.0 (%)

** Numbers do not add up to 100 per cent because of rounding errors.*

Tables 13 and 14 show data on monitoring of children by primary caregivers for children, aged 2 to 11 and 12 to 14 years respectively. While the vast majority appears to be well protected at home, we see that at least 5 per cent of children aged 2 to 11 years and over 10 per cent of children between ages 12 and 14 years are not receiving adequate monitoring.

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Table 13: Monitoring by primary caregiver of children, aged 2 to 11 years (N=2 138), South Africa, 2002

When looking after the child	Sometimes/ hardly ever (%)	Most of the time (%)	Always (%)
Are you present at home?	6.3	23.3	70.4
Are you near enough to call?	5.5	22.4	72.1
Do you require the child to tell you where he/she is going?	5.1	10.4	84.5

Table 14: Monitoring by primary caregiver of children, aged 12 to 14 years (N=740), South Africa, 2002

	Sometimes/ hardly ever (%)	Most of the time (%)	Always (%)
In the morning			
Present at home	13.8	26.2	60.0
Near enough to call	13.3	23.2	63.5
Require child to tell you where he/she is going	8.7	9.2	82.2
In the afternoon			
Present at home	13.3	24.7	62.0
Near enough to call	13.7	25.8	60.4
Require child to tell you where he/she is going	10.6	8.4	81.0
At night			
Present at home	6.8	12.6	80.6
Near enough to call	6.1	13.8	80.1
Require child to tell you where he/she is going	6.9	6.3	86.8
On the week-end			
Present at home	11.1	24.2	64.7
Near enough to call	12.2	22.1	65.7
Require child to tell you where he/she is going	10.2	11.2	78.6
N=740	66	91	583

Tables 15 and 16 show high-risk practices that make children vulnerable to sexual abuse. Caregivers of children aged 2 to 11 and children aged 12 to 14 years were asked about the frequency of these high-risk practices in the past week prior to questioning.

Table 15: Proportion of children, aged 2 to 11 years, involved in high risk practices (N=2 138), South Africa, 2002

		Often (%)	Sometimes (%)	Never (%)
Sent out of the home yard on an errand alone?	Total	9.2	34.5	56.3
	Female	10.5	33.5	56.0
	Male	7.8	35.5	56.7
Left at home alone?	Total	3.1	12.4	84.4
	Female	3.7	9.1	87.2
	Male	2.6	15.8	81.6
Left at home in the care of a person 15 or younger?	Total	4.2	23.6	72.2
	Female	2.5	23.9	73.6
	Male	6.0	23.2	70.7
Left in the care of a male family member?	Total	7.0	26.7	66.3
	Female	5.4	23.5	71.1
	Male	8.5	30.1	61.4
Left in the care of a male non-family member?	Total	0.8	2.9	96.3
	Female	0.5	2.6	96.9
	Male	1.1	3.3	95.6
Left in the care of a female non-family member?	Total	3.8	12.2	84.0
	Female	3.5	14.3	82.2
	Male	4.2	10.0	85.8
Out of the home yard without adult supervision?	Total	6.1	25.8	68.1
	Female	6.4	25.7	67.9
	Male	5.9	25.8	68.3

The results in Tables 15 and 16 show high exposure to risk for many children. Almost half of children between 2 and 11 years are often or sometimes sent out on errands alone, while the corresponding per cent is 74.2 for children aged 12 to 14 years. There is little difference between male and female children. At least a third of children

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Table 16: Proportion of children, aged 12 to 14 years, involved in high risk practices (N=740), South Africa, 2002

		Often (%)	Sometimes (%)	Never (%)
Sent out of the home yard on an errand alone?	Total	28.1	45.1	26.8
	Female	21.4	51.7	27.0
	Male	34.6	38.7	26.7
Left at home alone?	Total	12.3	35.9	51.8
	Female	7.6	36.9	55.6
	Male	16.7	35.0	48.3
Left at home in the care of a person 15 or younger?	Total	10.2	22.1	67.8
	Female	7.9	25.3	66.8
	Male	12.4	18.9	68.7
Left in the care of a male family member?	Total	12.1	30.4	57.5
	Female	9.9	26.3	63.8
	Male	14.3	34.3	51.4
Left in the care of a male non-family member?	Total	1.3	4.2	94.6
	Female	0.4	3.9	95.7
	Male	2.1	4.4	93.5
Left in the care of a female non-family member?	Total	3.9	9.8	86.3
	Female	2.8	12.5	84.7
	Male	4.9	7.2	87.9
Out of the home yard without adult supervision?	Total	12.3	54.4	33.3
	Female	8.9	58.3	32.8
	Male	15.6	50.7	33.7

aged 2 to 11 years are allowed outside the home yard without adult supervision. Two thirds of children between the ages of 12 and 14 years are allowed to do so. Again, the difference in the treatment of male and female children is small.

A considerable number of children are also left alone at home. The percentage increases with age, from 15 per cent of children aged 2 to 11 years to almost half of the children aged 12 to 14 years. The results show that males are more likely to be left alone at home, and that this increases with age. Almost a third of children aged 2 to 14 years are left in the care of a person 15 or younger. Among children aged 2 to 11 years, almost 30 per cent of girls and almost 40 per cent of boys are left in the care of a male family member.

Over a third of female children and almost half of male children, aged 12 to 14 years, are left in the care of a male family member.

Leaving children in the care of a non-family member, particularly male non-family members, is generally avoided. Nevertheless, the survey still shows that 3 per cent of children aged 2 to 11 years of age and 5 per cent of children aged 12 to 14 years are left in the care of a male non-family member. In general, male children were observed to be more likely to be left with a male non-family member than female children. It was found that female non-family members are more likely to be asked to care for children, particularly for female children.

Another key risk area for children is travelling to and from school. Between ages 6 and 14 years, 7 per cent of all children (9.7 per cent male and 4.2 per cent female) do not attend school. Of children between 2 and 11 years of age who attend some form of schooling (either a crèche, pre-primary or primary school), 18.7 per cent of children go to, and 19.8 per cent come home from, school unaccompanied. Thirty-one per cent of children in this age category are accompanied by an adult to school and 26 per cent of them are accompanied back home, while 44 per cent of the children go to school and 47.6 per cent return with someone of their own age. Between the age of 12 and 14 years, 34.2 per cent of children go to school and 29.3 per cent return home unaccompanied, 10.1 per cent of children are accompanied by an adult to school and 5.7 per cent from school, while 47.3 per cent are accompanied by someone of a similar age to school and 37.0 per cent from school.

Tables 17 and 18 show modes of transport used by children going to and from school. However, the vast majority travel to and from school on foot.

Research increasingly suggests that schools are unsafe environments for children (Brookes & Richter, 2001, Human Rights Watch, 2001). The safety and protection of children at school has become a national concern. Caregivers of children aged 2 to 11 may not be able to report accurately on the conditions at their children's schools, however we did

Table 17: Modes of transport to and from school used by children, aged 2 to 11 years (N=2 138), South Africa, 2002

Mode of transport	Home to school (%)	School to home (%)
On foot	75.7	75.4
Privately arranged	4.9	4.7
Private car	11.3	10.4
Local taxi	2.7	2.7
Minibus taxi	0.9	0.8
School bus	1.2	1.4
Public bus	0.5	0.8
Train	0.0	0.0
Other	0.8	0.8

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Table 18: Modes of transport to and from school used by children, aged 12 to 14 years (N=740), South Africa, 2002

Mode of transport	Home to school (%)	School to home (%)
On foot	80.8	81.4
Privately arranged	2.4	2.0
Private car	8.4	6.3
Local taxi	2.1	2.1
Minibus taxi	0.4	0.4
School bus	2.8	3.0
Public bus	0.3	0.7
Train	0.2	0.2
Other	0.9	0.9

ask children aged 12 to 14 years to rate their schools on various aspects of safety. Table 19 shows the key issues the children were asked about. The data shows that four fifths of children say that their educators always attend classes, while 10 per cent of children say that they often do so. Only 46 per cent of children report that the educators always watch the children arrive and only 35 per cent report that the educators always watch the children leave school. A little over a third of children report that educators always watch children during breaks and almost a third say that educators monitor toilets, an area which qualitative studies show to be particularly unsafe (Brookes & Richter, 2001). Two thirds of children report that educators ensure that no unauthorised person enters the school property. These figures clearly indicate that not enough is being done to protect children at school.

Table 19: Safety of children at school, aged 12 to 14 years, (N=740), South Africa, 2002

Monitoring practices	Always (%)	Often (%)	Sometimes (%)	Never (%)	No information obtained (%)
Educators attend classes	79.7	9.4	6.7	0.7	3.5
Educators watch children coming to school	46.4	17.2	17.9	14.9	3.7
Educators watch children at break time	35.6	14.8	27.2	19.1	3.4
Educators watch children leaving school	35.6	14.8	27.2	19.1	3.4
Educators monitor the toilets	30.6	18.0	24.0	22.9	4.5
Educators ensure that no unauthorised person enters the school	63.8	10.5	11.6	10.4	3.6

Table 20 shows that sexual harassment at schools is a serious problem. Two fifths of children surveyed report that boys sexually harass girls and 15 per cent of children report that male educators propose relationships with girl pupils. Reporting by gender showed little difference in perceptions about sexual harassment of girls, although girls were more likely to report on sexual harassment of girls by boys.

Table 20: Sexual harassment of female children at school, aged 12 to 14 years, (N=740), South Africa, 2002

Sexual harassment	N	Always/Often/ Sometimes (%)	Never (%)	No information given (%)
Boys sexually harass girls by touching, threatening, or making rude remarks				
Total = 740		40.3	55.2	4.5
Female = 381		44.4	53.3	2.3
Male = 359		36.5	57.0	6.5
Male educators propose relationships with girls				
Total = 740		15.5	77.7	6.8
Female = 381		16.4	77.6	6.0
Male = 359		14.6	77.9	7.5

3.5.3 Knowledge and communication about HIV/AIDS

3.5.3.1 Communication about sex, sexual abuse and HIV/AIDS in homes

Communication is an important weapon in the battle against HIV transmission. In the present study, we asked caregivers of children 2 to 11 years of age and children 12 to 18 years of age about communication about sex, sexual abuse and HIV/AIDS. Tables 21 and 23 show the responses of caregivers of children aged 2 to 11 and children aged 12 to 14 years to questions about communication in these three areas.

Table 21 shows that caregivers are more likely to discuss sexual abuse with girls. They are also more likely to communicate about sex, sexual abuse and HIV/AIDS with girls than with boys. Table 22 shows that two thirds of caregivers of children aged 2 to 11 years claim to be comfortable talking about sex and related matters such as HIV/AIDS with the children, while 15.8 per cent are not.

Although two thirds of caregivers of children, aged 2 to 11 years, say they are comfortable talking about sex and related matters to the children, little more than two fifths of children among 12 to 14 year olds say their parents have actually talked to them about these issues, with sexual abuse being slightly more talked about than sex and HIV/AIDS. Parents of females are significantly more likely to have talked to them about all three topics, particularly about sexual abuse. When asked whether it was good for a parent to talk about these topics with their children, 82.3 per cent of 12 to 14 year olds agreed or strongly agreed while only 5.9 per cent disagreed or strongly disagreed.

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Table 21: Communication between parents/caregivers and children, aged 2 to 11 years, about sex, sexual abuse and HIV/AIDS, South Africa, 2002

	N	Yes (%)	P Values
Have you ever discussed sex with this child?	2 138	10.2	
Gender			P<0.001
Male	1 092	5.7	
Female	1 047	16.0	
Have you ever discussed sexual abuse with this child?	2 138	28.8	
Gender			P<0.001
Male	1 092	21.3	
Female	1 047	38.7	
Have you ever discussed with this child how HIV/AIDS is transmitted?	2 138	11.9	
Gender			P=0.178
Male	1 092	10.3	
Female	1 047	13.5	
Have you ever discussed with this child how to prevent HIV/AIDS?	2 138	11.8	
Gender			P=0.068
Male	1 092	9.6	
Female	1 047	14.1	

Table 22: Attitudes of caregivers towards communication about sex and HIV/AIDS with children, aged 2 to 11 years (N=2 138), South Africa, 2002

	Strongly agree/ agree (%)	Neutral (%)	Disagree/Strongly disagree (%)	Not applicable (%)
I am comfortable talking with the children in my care about sex and related matters such as HIV/AIDS	67.0	9.0	15.8	8.2

Table 24 shows that of children between 12 to 14 and 12 to 18 years of age, a little over two thirds agreed that they were comfortable talking with a family member about HIV/AIDS. Again, females were significantly more likely to agree with this statement than males in the 12 to 14 and 12 to 18 year age groups.

Table 23: Communication between parents/caregivers and children, aged 12 to 14 years, about sex, sexual abuse and HIV/AIDS, South Africa, 2002

	N	Yes (%)	P values
Has a parent/caregiver:			
Ever talked to you about sex?	740	41.7	
Gender			P=0.001
Male		31.5	
Female		52.5	
Ever talked to you about sexual abuse?	740	50.4	
Gender			P=0.001
Male		38.2	
Female		63.2	
Ever talked to you about how HIV/AIDS is transmitted/prevented?	740	42.4	
Gender			P=0.004
Male		33.6	
Female		51.6	

Table 24: Proportion of children, aged 12 to 14 and 12 to 18 years, who feel comfortable talking to at least one family member about sex and related matters such as HIV/AIDS, South Africa, 2002

Comfortable	N	Strongly agree/ agree (%)	Neutral (%)	Disagree/strongly disagree (%)	P values
12–14	740	69.1	15.1	15.8	
Gender					P=0.005
Male	359	61.2	20.3	18.5	
Female	381	77.5	9.7	12.8	
12–18	1 850	71.5	11.4	17.1	
Gender					P<0.001
Male	919	65.0	15.8	19.2	
Female	931	77.9	7.1	15.0	

3.5.3.2 Sources of information about sex, sexual abuse and HIV/AIDS

The 12 to 14 year old children listed schools as the most important source of HIV/AIDS information (85.9%), followed by parents/caregivers (39.9%), and faith-based organisations (25.5%).

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Table 25 shows that schools and teachers are the most important sources of information for children, aged 12 to 14 years, about sex and sexual abuse. Families are the next most important source of information, with the mother being more likely than any other family member to be the child's source of information. Of the child respondents, 19.3 per cent say that they have learned about sex and 30.3 per cent say that they have learned about sexual abuse from their mothers. These figures contrast strongly to those showing fathers to be a source of information on these issues: in the 12 to 14 year age group, only 1.5 per cent of children have learned about sex and 1.2 per cent of children have learned about sexual abuse from their fathers. Peer groups are the next most important source of information about sex. However, the media appears to be more informative than peer groups or acquaintances on sexual abuse.

Table 25 shows where information was actually obtained from.

Table 25: Most important sources of information about sex and sexual abuse for children, aged 12 to 14 years (N=740), South Africa, 2002

Source	Sex (%)	Sexual abuse (%)
School/teacher	53.6	47.2
Family/relative	22.4	34.2
Peer group/acquaintance	11.2	4.9
Nobody/self	4.7	2.1
Media	3.3	6.4
Other	3.3	3.3
No response	1.5	1.9

3.5.3.3 Knowledge about HIV/AIDS

Knowledge, among children aged 12 to 14 years, about how HIV/AIDS is transmitted and how it can be prevented is shown in Tables 26, 27, 28 and 29. Only half of all respondents agreed that HIV could be transmitted through unprotected vaginal sex. Knowledge of whether HIV could be transmitted by unprotected vaginal sex was higher among those children whose parents had spoken to them about sex and HIV/AIDS. Just over two thirds of children thought condoms could protect them from getting HIV, while only one fifth felt that avoiding penetrative sex would protect them. Females agreed more frequently than males that condoms would protect a person against HIV/AIDS. Again, knowledge of condoms as a means of prevention was greater among children whose parents had spoken to them about sex and HIV/AIDS.

Table 26: Knowledge of HIV transmission among children, aged 12 to 14 years (N=740), South Africa, 2002

12–14 years	
HIV is transmitted by:	Agree (%)
Unprotected vaginal sex	49.7
Sharing needles	30.1
Exchange of body fluids	12.1
Contaminated blood	25.4
Kissing	4.3
Drinking from the same cup	1.3
Sharing a cigarette	1.6

Table 27: Knowledge of 12 to 14 year olds about HIV transmission through unprotected vaginal sex by gender, living area, socio-economic status, education level and communication with a parent/caregiver about sex and HIV/AIDS, South Africa, 2002

How HIV is transmitted: unprotected vaginal sex	N	Yes (%)	No (%)	
Total	740	49.7	50.3	
Gender				P=0.10
Male	359	41.8	58.2	
Female	381	58.1	41.9	
Living area				P=0.281
Urban	509	53.4	46.6	
Rural	231	46.7	53.3	
Household situation				P=0.014
Not enough money for basics, such as food & clothes	284	45.6	54.4	
Enough money for food & clothes, but not for many other things	280	45.6	54.4	
Enough money for most things, including luxuries	176	68.8	31.2	
Education level				P=0.068
Up to end of primary school	526	47.1	52.9	
High school	214	59.5	40.5	
Has a parent/caregiver ever talked to you about HIV/AIDS?				P<0.001
Yes	386	65.3	34.7	
No	354	38.3	61.7	
Has a parent/caregiver ever talked to you about sex?				P<0.001
Yes	354	69.1	30.9	
No	386	35.9	64.1	

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Table 28: Knowledge of protection against HIV among children, aged 12 to 14 years, South Africa, 2002

12–14 years		
What should you do to protect yourself from getting HIV?	Agree	P Values
Use a condom (N=740)	69.4	
Gender		(P=0.024)
Male (N=359)	63.3	
Female (N=381)	75.7	
Do not have penetrative sex	21.0	
Gender		(P=0.074)
Male	16.9	
Female	25.6	
Do not share needles	15.6	
Gender		(P=0.188)
Male	12.3	
Female	19.0	

Table 29: Knowledge of condom use as a form of protection against HIV/AIDS by gender, living area, socio-economic status, education level and communication with a parent/caregiver about sex and HIV/AIDS among children, aged 12 to 14 years, South Africa, 2002

Protection from HIV: use a condom	N	Yes (%)	No (%)
Total	740	69.4	30.6
Gender			P=0.024
Male	359	63.3	36.7
Female	381	75.7	24.3
Living area			P=0.540
Urban	509	67.5	32.5
Rural	231	70.9	29.1
Household situation			P=0.779
Not enough money for basics like food & clothes	284	67.7	32.3
Money for food & clothes, but not for many other things	280	69.3	30.7
Enough money for most things, including luxuries	176	73.3	26.7



→ Protection from HIV: use a condom	N	Yes (%)	No (%)	
Education level				P=0.162
Up to end of primary school	526	67.6	32.4	
High school	214	75.9	24.1	
Has a parent/caregiver ever talked to you about HIV/AIDS?				P=0.020
Yes	386	77.2	22.8	
No	354	63.6	36.4	
Has a parent/caregiver ever talked to you about sex?				P=0.038
Yes	354	76.5	23.5	
No	386	64.2	35.8	

3.5.4 Discussion

One of the main limitations of this study was that, for ethical reasons, types and levels of child abuse could not be measured. This prevented determining the extent to which it contributed to the transmission of HIV, particularly in relation to vertical and nosocomial transmission. Further research on how to access and measure this kind of information in relation to the spread of HIV and the levels of infection in children is urgently needed. Furthermore, due to insufficient numbers of children recruited for the survey, we are unable to correlate child HIV prevalence with risk factors for children. In subsequent analysis we intend to examine the contribution of different risk factors to the probability of a child being infected. Preliminary analysis, however, enables us to show the proportion of children who are at risk in terms of their:

- Environment;
- Care and protection; and
- Knowledge of HIV/AIDS.

In terms of environment, at least 45 per cent of children report that they do not have enough resources for basic necessities such as food and clothes. We hypothesise that poor environments present a greater risk for HIV infection in children, because resources, both materially and in terms of personal care, are too low to ensure adequate protection. This hypothesis will be tested in further analysis. The majority of children without enough resources for basic needs live in urban informal settlements. This environment may increase the risk for HIV infection in children through sexual abuse, and data from this study does indicate a higher prevalence among children in these areas. Moreover, almost a third of children are exposed to someone in their home or neighbourhood who gets drunk at least once a month. Alcohol abuse may also be a factor in sexual abuse and HIV transmission.

The majority of children receive adequate monitoring at home. However at least 5 per cent of children aged 2 to 11 years and 10 per cent of children aged 12 to 14 years are not adequately monitored. Even more worrying is the proportion of children, who are involved in what we have called high risk practices, such as being sent alone on an errand. The awareness of parents and communities about these issues must be increased.

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Going to and coming home from school also presents considerable risk for children, and clearly many children are not protected. Interventions are required to bring schools and communities together to help provide more adequate protection for children. In addition, existing levels of protection at schools need to be improved. Sexual abuse by educators and co-students remains a serious problem that must be addressed.

Adequate knowledge and communication about HIV/AIDS and related matters are an important resource for protecting children from contracting HIV. Although almost half of the children, aged 12 to 14 years, report that parents or guardians have discussed sex, sexual abuse, HIV/AIDS transmission and prevention with them, parent-child communication on these issues must clearly be improved. This is even more true for children aged 2 to 11 years. The results show that parental communication on these matters with children, aged 12 to 14 years, correlated significantly with a child's knowledge about how HIV is transmitted and (to a lesser extent) prevented. Overall parent-child communication is more frequent with female children, particularly by mothers. Fathers should be encouraged to communicate more with their children. More communication must be directed toward male children. Schools and educators are by far the major source of information for children on HIV/AIDS, although we cannot establish how effective this communication is in terms of knowledge and behavioural responses such as prevention. Nevertheless, schools and educators as well as mothers are clearly far more important pathways than the media in educating and protecting children. Thus, intervention programmes may be more effective if directed to these groups than through generalised media campaigns. Although levels of communication are considered reasonably good, knowledge of how HIV is transmitted is still deficient, particularly in the 12 to 14 year age group. In this group, only half of the children agree that HIV is transmitted through unprotected vaginal sex and only 21 per cent agree that abstinence is a form of protection. Since many children may not regard abstinence as a viable option, more research into how children understand the various aspects of transmission and protection is needed so that interventions can better improve existing levels of knowledge.

4. CONCLUSIONS AND RECOMMENDATIONS



HIV prevalence

HIV prevalence was found to be high at 5.4 per cent for children aged 2 to 18 years of age. With no comparable data available for South Africa, it is difficult to interpret or verify these prevalence data. Further studies are underway to confirm the levels of HIV prevalence in children. Studies are also being conducted to validate testing serostatus using oral fluid from children.

Additional research is necessary to further examine the findings of this study. In particular, research will need to focus on the impact of sexual abuse, and on the extent of health service acquired infections. Sexual abuse is a critical issue since the findings in this study indicate that a large proportion of South African children is exposed to high-risk environments. Researchers will need to address both the difficulties and the ethical problems of research on sexual abuse, so that its contribution to HIV transmission can be accurately assessed and dealt with.

Orphanhood

Orphanhood, here defined as maternal orphans, was 3.3 per cent. This finding suggests that South Africa has not yet felt the full impact of AIDS on orphanhood and that there is still time to prepare for the full impact. Given the data demonstrating that African children, children in poor households, children living in informal settlements and older children are most affected, relevant institutions should focus on these groups and explore the most constructive ways of helping them. Developing community-based support for orphans should be the main focus given the negative impact of institutionalisation on children.

This study still needs to investigate data on children not living with a biological parent. Anderson *et al.*, (2002) show that fosterage increased from 6.7 per cent (OHS survey) to 15 per cent (SADHS survey) from 1995 to 1998. However, the reasons for this increase are not fully understood. More research needs to be done on child migration between families and other localities, on other adaptations to economic constraints on proper childcare, and on the burden of orphanhood. Further studies need to find ways of assessing orphanhood due to AIDS. Methods to ensure accurate reporting of parental deaths due to AIDS, without increasing the associated stigma for children, must be developed.

Child-headed households

Data on child-headed households suggests that additional research in this area is required. As with orphan status, South Africa may not yet have experienced the full impact of AIDS on the degree of child-headed households. There is still some time to anticipate and prepare for a substantial increase in the near future. Further research on reasons for child-headed households is required, particularly on the proportion attributable to AIDS.

Sexual debut and experience

In this study, children 11 years and younger were not asked about sexual debut and experience, and very few children aged 12 to 14 years reported having had sexual

experience. Improved methods in assessing sexual behaviour in children need to be developed because of the significant role it may play in HIV transmission in children.

Risk factors and risk environments for children

The present study identified three components of child vulnerability to HIV infection:

- Risk environments;
- Care and protection of children; and
- Knowledge and communication about sex and HIV/AIDS.

However, the numbers were too low to reliably measure child HIV prevalence against these three factors. More research is needed to establish the impact of risk, protection as well as knowledge on HIV transmission.

In terms of risk environments, this study shows that levels of poverty and exposure to alcohol and drugs are high for South African children. It also shows that care and protection of children in both homes and schools are not adequate, and that children are at risk for sexual abuse and possible HIV transmission in both situations. Interventions should focus on increasing both care and protection for children at home and at school and on making communities safer.

Correct knowledge about HIV/AIDS transmission and prevention is still deficient, and communication about sex, sexual abuse and HIV/AIDS between caregivers/parents and children is not adequate. Schools and families are shown to be the most important sources of information for children and correct knowledge about HIV/AIDS transmission and prevention correlates with good parent-child communication. Unfortunately, parental communication with boys is significantly lower than with girls on sex, sexual abuse and HIV/AIDS. Thus, specific interventions must focus on parental communication on these issues with boys. The role of schools and educators as sources of information on HIV/AIDS and their impact on behavioural responses must be examined in more detail. Particularly younger children need to be better informed. More support is needed for schools, educators and mothers as dominant sources for educating children about sex and related matters. More research is required to assess how children get their information and how they understand aspects of HIV/AIDS transmission and protection. Interventions can then better address the current low levels of correct information in these areas.

Significance and future research

This study has provided pioneering contributions to the study of HIV/AIDS in children. The researchers faced considerable challenges in studying children and valuable lessons have been learned. However, many challenges and questions still remain and more research, particularly on prevalence and the factors that contribute to transmission of HIV to children, is urgently required. We are in the process of further elucidating the data of this study. We hope that the lessons learned from this study will contribute to furthering research in the field of HIV/AIDS and children.

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