THE AKAIS

AKWA IBOM STATE AIDS INDICATOR SURVEY REPORT

Foreword

Since 1991, the Nigeria Federal Ministry of Health (FMOH), in collaboration with its development partners, has been implementing various routine surveys, including the Antenatal Care (ANC) Seroprevalence Sentinel Surveys among pregnant women, the National HIV/AIDS and Reproductive Health Surveys (NARHS) among the general population and the Integrated Biological and Behavioural Surveillance Surveys (IBBSS) among key and vulnerable populations. These survey findings have provided useful information for monitoring and guiding program implementation. However, despite these routine surveys and program monitoring data, there are gaps in available information for program planning and donor reporting.

The AIDS Indicator Survey (AIS) was developed to provide countries with a standardized tool to obtain indicators for effective monitoring of national HIV/AIDS programs. The design of the AIS was informed by the need to provide timely information for global HIV/AIDS program reporting, including the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) and the United Nations General Assembly Special Session (UNGASS) indicators, while ensuring comparability across countries.

The Akwa Ibom AIDS Indicator Survey (AKAIS) is the first AIS to be conducted in Nigeria and to have its findings disseminated. The AKAIS has many firsts: (i) it is the first population-based survey to present HIV incidence estimates for any state in Nigeria, (ii) the first survey to provide HIV prevalence estimates for children ages 0–14 years, and (iii) the first to provide information on unmet needs for HIV services in Nigeria. The findings of the survey will provide up-to-date information to better characterize the HIV epidemic in Akwa Ibom State and inform future HIV/AIDS program planning and implementation. The survey's findings will also provide baseline data to inform future evaluations of program interventions, including PEPFAR's Sustainable Epidemic Control and Global Fund (Global Fund to Fight AIDS, Tuberculosis and Malaria), as well as progress toward the Joint United Nations Programme on HIV/AIDS (UNAIDS) 90-90-90 targets in the state. Consequently, the report of the AKAIS is recommended to program planners, implementers, and funding agencies as a resource to inform future HIV/AIDS programming in the state. Moreover, lessons learned from the AKAIS will serve as a precursor to future AIDS impact assessments in Nigeria.

Suggested Citation

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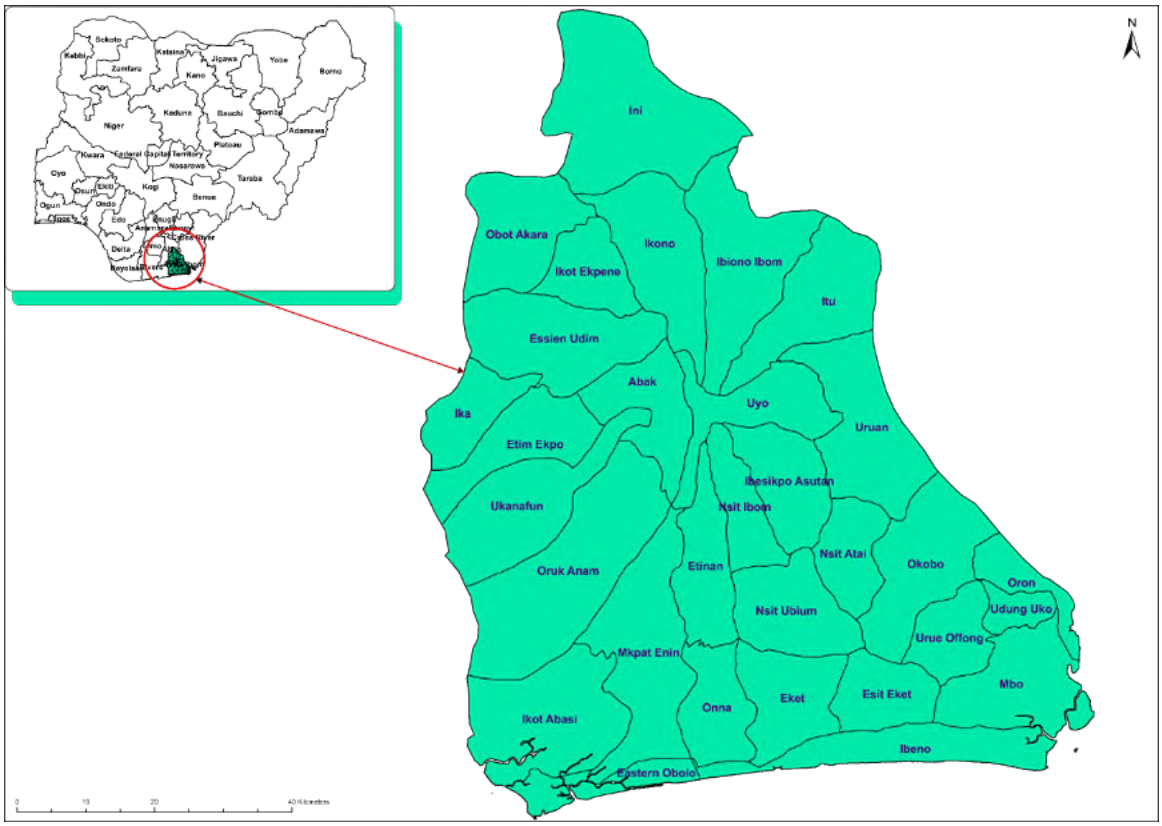

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Abbreviations

AIDS	acquired immunodeficiency syndrome
AIS	AIDS Indicator Survey
AKAIS	Akwa Ibom AIDS Indicator Survey
AKSACA	Akwa Ibom State Agency for the Control of HIV/AIDS
AKSMOH	Akwa Ibom State Ministry of Health
ANC	antenatal care
ART	antiretroviral therapy
ARV	antiretroviral
CD4	cluster of differentiation 4
CDC	U.S. Centers for Disease Control and Prevention
CDC-HQ	U.S. Centers for Disease Control and Prevention, Headquarters
CISHAN	Civil Society for HIV/AIDS in Nigeria
COB	central operational base
CSPro	Census and survey processing system
DBS	dried blood spot
DNA	deoxyribonucleic acid
DTS	dried tube specimen
EA	enumeration area
EDTA	ethylenediaminetetraacetic acid
EIA	enzyme immunoassay
EID	early infant diagnosis
ELISA	enzyme-linked immunosorbent assay
EQAPT	external quality assessment proficiency testing
FMOH	Federal Ministry of Health
FRR	false-recent rate
GPS	global positioning system
HCT	HIV counseling and testing
HIA	HIV Impact Assessment
HIV	human immunodeficiency virus
HTS	HIV testing services
HQ	Headquarters
IBBSS	Integrated Biological and Behavioural Surveillance Survey
IEC	information, education, and communication
IMEI	international mobile equipment identity
IUD	intrauterine device
LACA	Local Action Committees on AIDS
LAg-Avidity	Limiting Antigen-Avidity
LGA	local government area
MAA	multi-assay algorithm
MDRI	mean duration of recent infection
MOT	Modes of Transmission [report]
MSM	men who have sex with men
NACA	National Agency for the Control of AIDS
NARHS	National HIV/AIDS and Reproductive Health Survey
NASCP	National AIDS and STIs Control Program
NDHS	National Demographic and Health Survey
NEPWAN	Network of People with HIV/AIDS in Nigeria
NPC	National Population commission
NPHCDA	Nigeria Primary Health Care Development Agency
NYNETHA	Youth Network on HIV/AIDS in Nigeria
PCR	polymerase chain reaction
PEPFAR	U.S. President's Emergency Plan for AIDS Relief
PLHIV	people living with HIV
PMTCT	prevention of mother-to-child transmission
PT	proficiency testing
PWID	people who inject drugs

QA	quality assurance
QC	quality control
RITA	recent infection testing algorithm
RMNCH	reproductive, maternal, neonatal, and child health
RNA	ribonucleic acid
SIM	subscriber identity module
SMOH	State Ministry of Health
SOP	standard operating procedure
STI	sexually transmitted infection
TBA	traditional birth attendants
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNGASS	United Nations General Assembly Special Session
USAID	U.S. Agency for International Development
UUTH	University of Uyo Teaching Hospital
VPN	virtual private network
WHO	World Health Organization

Executive Summary

Introduction

The most recent survey providing HIV prevalence estimates for Akwa Ibom State is the 2014 Antenatal Care (ANC) Sero-prevalence Sentinel Survey among pregnant women; the observed prevalence was 10.8 percent. The National HIV/AIDS and Reproductive Health Surveys (NARHS) Plus 2012, a population-based prevalence survey in the general population, found an HIV prevalence of 6.5 percent in the age group 15–49 years. HIV program data from National AIDS and STIs Control Program (NASCP) in 2015 showed that the HIV positivity rate was 4.5 percent for Akwa Ibom, 4.1 percent for South-South, and 3.5 percent for national.
[1] The heterogeneity among the prevalence figures from these disparate sources therefore necessitated another survey to provide more accurate estimates of HIV prevalence in Akwa Ibom State.

The Akwa Ibom AIDS Indicator Survey (AKAIS) is the first HIV-focused, population-based survey to be implemented in Nigeria and to have its findings disseminated. AKAIS was designed to fill gaps in HIV data, as well as to provide evidence-based guidance to the design of future HIV control activities in the state. Some specific HIV data gaps which AKAIS was designed to fill are: (i) precision in measurement of prevalence using a representative sample at the state level; (ii) HIV incidence among people 15 years and older; (iii) viral load among HIV-infected people; (iv) access, coverage, and uptake of HIV care and treatment services; (vi) demographic, socioeconomic, and behavioral risks factors that drive the HIV epidemic; and (vi) knowledge and attitudes toward HIV.

Summary of findings

Demographics and household composition

A total of 4,313 household questionnaires were analyzed, representing the number of households in the survey. Most (90.8 percent) of the respondents who completed the household questionnaires were the head of household. A total of 16,994 people from the selected households were eligible. There were more females (52.6 percent), than males in the overall household make-up. Children 10 years and less represented the largest age group in the households, making up 32.6 percent in urban areas and 34.3 percent in rural areas.

Respondent characteristics

Respondents ages 0–9 years: Of the total of 4,828 people in this age category who were surveyed, 3,446 (69.0 percent) resided in rural areas. A total of 2,409 (49.9 percent) were male and 2,419 (50.1 percent) were female. Children ages 5–9 years numbered 2,371 (49.0 percent), while those ages 4 years and less were 2,457 (50.9 percent).

Respondents ages 10–14 years: A total of 1,818 people in this age category were surveyed, with 537 (31.7 percent) from urban areas and 1,281 (68.3 percent) from rural areas. A total of 972 (53.2 percent) were male and 846 (46.8 percent) were female.

Respondents ages 15 years and older: A total of 8,963 people in this age category were surveyed. Of those surveyed, 55 percent were female; people ages 15–19 years constituted 15.1 percent, while people ages 50 years and older constituted 24.2 percent. A total of 68 percent of this population resided in rural areas. One hundred twenty-four (1.4 percent) were students, while 96 (1.1 percent) were unemployed. With regard to education, 90.5 percent reported that they had ever attended school, and 34.9 percent reported secondary education as their highest level attained. Of the respondents, 39.2 percent reported that they had done work for which they received cash payment in the 12 months preceding the survey.

Knowledge, attitudes, disclosure of HIV status

Knowledge of HIV and AIDS among people ages 10–14 years: The majority of the adolescents (71.8 percent) had heard about HIV and AIDS, and the most common source of information was school, reported by 1,025 adolescents (79.7 percent). Knowledge of prevention methods generally aligned with known transmission methods.

Knowledge of and attitude to HIV and AIDS among people ages 15 years and older: Overall, only 29.1 percent of adults ages 15 years and older reported the five knowledge indicators correctly. Comprehensive knowledge of HIV transmission was higher among males (32.3 percent) than females (26.7 percent) and in urban areas (36.7 percent) than rural areas (25.7 percent).

Perceived risk of HIV infection among adolescents ages 12–14 years: Among 797 adolescents in this age category who had heard about HIV, 599 (74.9 percent) did not perceive themselves as likely to get infected with HIV, 33 (4.2 percent) said they were somewhat likely, 19 (2.5 percent) said they were very likely to get HIV, and 143 (18 percent) did not know their likelihood of getting HIV.

Perceived risk of HIV infection among people ages 15 years and older: In this category, 58 percent did not perceive themselves as being at risk for HIV, while 26.6 percent perceived their risk of getting infected to be small. However, 3.4 percent felt that their risk was moderate, while 1.3 percent felt their likelihood of getting infected was high.

Self-reported HIV status among HIV-infected people: Among the 8,933 people ages 15 years and older who responded to HIV testing questions, 4,175 (47 percent) reported that they had ever been tested for HIV. Of those who reported ever being tested for HIV, 91.8 percent said that their last test results were negative, 2.1 percent reported positive test results, and 4.3 percent did not receive their results.

Behavioral risk among adolescents ages 10–14 years

Sexual behavior among adolescents: A total of 86 (22.1 percent) reported that they had ever had sex. Vaginal sex was the most common practice, reported by 85 respondents (98.7 percent). None of the sexually active adolescents reported ever having anal sex. Only 8 (9 percent) reported using condoms at first sex. Forty-eight (57.2 percent) had their first sex with an older partner. Thirty-seven percent reported their sexual debut as occurring before the age of 12 years. Eleven (12.2 percent) reported having ever had sex in exchange for money or material goods. The majority, 72 (84.7 percent), reported having had one sexual partner in their lifetime.

A higher proportion of out-of-school adolescents, 41.9 percent, reported ever having had sex compared to in-school adolescents, at 21 percent.

Alcohol and mood-altering drug use among adolescents ages 10–14 years: Among the adolescents surveyed, 732 (40.8 percent) reported ever drinking alcohol, while 25 (1.4 percent) reported ever taking mood-enhancing drugs/substances.

Behavioral risk among people ages 15 years and older

Sexual exposure among people ages 15 years and older: Overall, 90.6 percent of adults ages 15 years and older had ever had sex. The proportion of adults ages 15 years and older who had ever had sex was high across all age categories except for adults ages 15–19 years. The proportion of adults ages 15 years and older who had ever had sex was higher among females (91.9 percent) than males (89.0 percent). A total of 8,073 (98.9 percent) said that they had ever had vaginal sex, and 146 (1.8 percent) said that they had ever had anal sex. The mean age of sexual debut was 18.95 (±4.95) years for vaginal sex and 21.1 (±6.10) years for anal sex.

Condom use during first sex among people ages 15 years and older: Of the 8,073 people who said they ever had vaginal sex, 7,989 responded to the question on condom use. Out of the 7,989 people ages 15 years and older who had ever had vaginal sex, 1,284 (16.2 percent) reported condom use at first vaginal sex. Of the 146 people ages 15 years and older who said that they had ever had anal sex, 34 (22.9 percent) reported condom use at first anal sex.

Number of lifetime sexual partners: Number of lifetime sexual partners ranged from 1 to 100, with an average of 1 (mode of 1). Among 7,869 people ages 15 years and older who reported their number of lifetime sex partners, 4,998 (63.7 percent) had had one lifetime sex partner, while 2,871 (36.3 percent) reported more than one lifetime partner.

Alcohol consumption and mood-altering drug use: A total of 5,268 (58.8 percent) people surveyed said that they had ever consumed alcohol. Use of various mood-enhancing drugs was reported by 787 (8.8 percent) of people ages 15 years and older. The most common one reported was Indian hemp at 414 (52.8 percent), followed by tobacco at 361 (46.0 percent). With respect to injection drug use for pleasure, 38 (0.4 percent) of those surveyed reported ever injecting drugs for pleasure, of whom nine (23.7 percent) had injected drugs in the three months preceding the survey. Of the nine respondents who had injected drugs for pleasure in the previous three months, two had shared syringes or needles

with other people, and one did not know the status of the person(s) with whom the needles were shared.

Prevalence of HIV

The overall prevalence of HIV observed in Akwa Ibom State was 2.8 percent. The point prevalence in children 0–14 years was 0.4 percent, and 4.8 percent for adults ages15 years and older. A total of 2,457 children ages 0–4 years, 2,371 ages 5–9 years, and 1,765 adolescents ages 10–14 years were tested for HIV in Akwa Ibom State.

Prevalence of HIV by demographic characteristics: Prevalence of HIV was 0.4 percent in children ages 0–4 years, 0.3 percent in children ages 5–9 years, and 0.6 percent in adolescents ages 10–14 years. HIV prevalence is higher in rural areas than in urban areas for age groups 0-9 and 10-14 years. No HIV-positive children ages 0–9 years were found in 17 local government areas (LGAs).

Prevalence of HIV among people ages 15 years and older and by selected demographic characteristics: The highest prevalence rates were observed in adults ages 35–39 years, followed by ages 30–34 years. HIV prevalence by five-year age category shows rates of 1.5 percent among people ages 15–19 years, 4.7 percent for those 20–24 years, 5.3 percent among those 25–29 years, 7.3 percent in adults 30–34 years, 7.6 percent among adults 35–39 years, 6.3 percent in adults ages 40–49 years, and 3.3 percent among respondents ages 50 years and older. HIV prevalence was highest among people previously married. HIV prevalence values were 4.8 percent among married people and 3.4 percent among cohabitating partners.

HIV prevalence was higher among those who had had any schooling, at 4.6 percent, compared to those who had no schooling, at 3.9 percent. The prevalence of HIV was 3.8 percent among those who had no education, 6.3 percent among those who had had primary education only, 4.2 percent among respondents with a secondary education, and 2.5 percent among those with tertiary education.

HIV Incidence

A total of 8,306 men and women ages 15 years and older were initially tested in the household. Of these, 393 were HIV-1 seropositive following HIV confirmatory testing in the laboratory. Ninety-four percent of HIV-1 seropositive individuals were further tested for recent infection using Limiting Antigen (LAg)-Avidity enzyme immunoassay (EIA) combined with viral load test. Reactive LAg-Avidity assay and viral load >1000 copies/ml were considered recent infections. HIV incidence was calculated using the CDC Incidence calculator. The unweighted and unadjusted HIV-1 incidence estimates by the LAg-Avidity EIA was 0.72/100 PY. The adjusted HIV-1 incidence was 0.41/100 PY.

Incidence of HIV in people ages 15 years and older: The results show that there was 0.41 percent annual HIV incidence among adults ages 15 years and older. This translates to 13,000 new cases of HIV infections annually in persons 15 years and older in Akwa Ibom. The HIV incidence rates were similar in females and in males (0.41 percent among females and 0.42 percent among males). The HIV incidence in people ages 15–19 was 0.84 percent, translating to 5,000 estimated new infections in this age group; this accounts for nearly half of the new infections occurring in age groups 15 years and

older. Incidence in this age group (15–19 years) is higher in males (1.46 percent) than in females (0.96 percent).

HIV program participation among respondents

Previous HIV counseling and testing coverage among respondents: HIV testing among people ages 0–14 years: Overall, 675 (14.2 percent) of children ages 0 months–14 years were reported to have ever been tested for HIV. Disaggregation of HIV testing by age category shows a reduction in the proportion of people who had ever been tested for HIV with increasing age.

HIV testing among people ages 15 years and older: Among the 8,933 people ages 15 years and older who responded to the questions on HIV testing, 4,175 (47 percent) reported that they had ever been tested for HIV, with 34.5 percent reporting being last tested in the one to two years preceding the survey. Those who reported being tested less than three months and three to five months preceding the survey were both 13.3 percent. The majority reported that their last HIV test was done in a health clinic (42.7 percent), followed by mobile HIV testing service (HTS) units (22.6 percent), hospital outpatient clinics (10.4 percent), and at home (10.2 percent). The testing rate was higher among females (48.4 percent) than males (45.4 percent). The HIV testing rate varied by age category. It was highest among adults ages 30–34 years (64.7 percent) and lowest in the age category 15–19 years (27.3 percent).

HIV care and treatment program coverage

HIV care and treatment coverage of HIV-infected people ages 15 years and older: A total of 70 (78.1 percent) of adults and adolescents 15 years and older who self-reported a positive HIV test result said that they had ever received care from a health care provider. These comprised 68.8 percent of males and 81.3 percent of females. About 90.9 percent of self-reported HIV-positive people in urban areas had access to medical care from a health care provider compared to 67 percent of people in rural areas.

Of the 70 people who reported ever receiving care for HIV care from a health worker, 67 (95.3 percent) reported ever receiving antiretrovirals (ARVs), of whom 54 (77.1 percent) were currently taking ARVs. Seventy-four percent of males and 83.1 percent of females had access to ARVs (i.e., were currently on ART).

Furthermore, 32 (45.9 percent) of this age group had ever had viral load testing. Twenty (62.8 percent) of them were told the result of the viral load test.

Travel time and transport cost to health facilities among HIV-infected persons 15 years and older: Of the 70 people ages 15 years and older who reported that they were HIV positive and had ever received HIV medical care, 46 (66.3 percent) reported less than an hour of travel time and 16 (22.9 percent) had one to two hours of travel time to the health facility. The transport cost ranged from N0.00 to N3,000.00, with an unweighted mean of N431.14, median of N225.00 and mode of N200.00.

Reproductive health and prevention of mother-to-child transmission (PMTCT)

HIV counseling and testing in pregnancy: Antenatal attendance was 74 percent among women ages 15 years and older who reported live births in the three years preceding the survey. HIV testing for PMTCT was reported as being conducted prior to pregnancy in 48 percent of respondents. Among those who attended ANC, 80.1 percent of women were offered HIV testing, of whom 96.4 percent were tested. Among women who delivered in health facilities, 23.9 percent were offered HIV testing during labor, and 84.2 percent of the women who were offered HIV testing actually tested for HIV.

ARV use before, during, and after pregnancy among self-reported HIV-infected women: For women who reported being pregnant in the three years preceding the survey, access to ARVs was 37 percent before pregnancy and 43.8 percent while breastfeeding. Seventeen out of 19 women who tested HIV positive during pregnancy received ARVs, while only one woman who reported testing HIV positive during labor received ARVs.

ARV prophylaxis among HIV-exposed infants: Among the 27 women who had tested positive for HIV prior to pregnancy, 11 (40.7 percent) reported that their babies had received ARVs for PMTCT. Among the 19 women who had tested positive for HIV during pregnancy, 13 reported that their babies had received ARVs for PMTCT. The only woman who reported testing positive to HIV during labor reported that her baby did not receive ARVs for PMTCT.

Family planning and fertility desires of HIV-infected pregnant women: The contraceptive prevalence rate reported by married or cohabitating women ages 15 years and older was 22.4 percent. The methods of family planning reported to be used include: male condoms (n=59 or 20.6 percent), injections (n=92 or 31.3 percent), oral contraceptives (n=64 or 21.2 percent), withdrawal (n=40 or 13.6 percent), implant (n=28 or 9.8 percent), rhythm/natural method (n=28 or 9.4 percent), female sterilization (n=8 or 2.7 percent), female condoms (n=2 or 0.5 percent), and intrauterine devices (IUDs) (n=8 or 2.7 percent).

Blood and injection safety among people ages 15 years and older: Among the 8,932 adult respondents, blood transfusion and donation rates were low, at 4.3 percent and 4.8 percent, respectively. Most blood donations were made in public hospitals on request and voluntarily. In the 12 months preceding the survey, 35.5 percent of survey participants ages 15 years and older reported that they received medical injections and that the majority (90.4 percent) of these injections were administered by health care workers. In 11.3 percent of respondents, injections were given by traditional practitioners. Among those who received medical injections from a health care worker, 93.4 percent reported that new, unopened syringe was used.

Conclusion and recommendations

The study provides the first overall assessment of HIV prevalence and incidence for all age groups in Akwa Ibom State. The point prevalence among people ages 15 years and above was 4.8 percent. This age group represents the sexually active age group responsible for heterogeneous transmission of HIV. The burden of the disease is continually increasing in the state on a yearly basis, with at least 13,000 new cases of HIV occurring annually in people 15 years and older. Again, young people ages 15–19 years have the highest new infection rates in the state. We conclude that HIV remains a health problem in Akwa Ibom State and affects people in their most productive phase of life. The risk factors associated with HIV infection and the burden of the disease in the state are now better understood and should be used for improved programming and budgeting for HIV control in Akwa Ibom State.

Chapter 1:

Introduction

1.1 Background

1.1.1 Status of HIV/AIDS globally and in Nigeria

Globally, an estimated 36.7 million (30.8 million–42.9 million) people were living with HIV in 2016.[2] Sub-Saharan Africa is the region most affected by HIV/AIDS, accounting for nearly 80 percent of all people living with HIV (PLHIV), 64 percent of all new infections, 72 percent of all AIDS-related deaths, and 86 percent of all pediatric PLHIV in 2016. In the same year, an estimated 3.2 million PLHIV were in Nigeria, comprising the second largest population of PLHIV in the world after South Africa.[2] Nigeria also had the highest number of new infections among children globally (37,000 [22,000–56,000]) in 2016.[2]

1.1.2 Trends of HIV prevalence in Nigeria

Three decades after the first case of AIDS was reported in Nigeria, progress has been made in monitoring HIV prevalence estimates using sentinel surveillance and population-based surveys. The use of the National HIV Sentinel Survey among pregnant women attending antenatal clinics or assessing the epidemic was adopted by the Nigerian government in reporting HIV prevalence in line with World Health Organization (WHO) guidelines.[3] In 1991, the Federal Ministry of Health (FMOH) conducted the first HIV sentinel surveillance survey, which estimated the national HIV prevalence to be 1.8 percent. As shown in Figure 1-1, additional surveys showed an increasing trend to a peak of 5.8 percent in 2001. In 2003, Nigeria saw its first decline in HIV prevalence, from 5.8 percent to 5.0 percent. The prevalence has now declined to 3.0 percent in 2014.[4] The 2014 ANC Sentinel Survey reported the highest prevalence in Benue State (15.4 percent) and the lowest in Zamfara (0.9 percent). In that survey, Akwa Ibom had the second highest prevalence rate of 10.8 percent in the country after Benue State.[4]

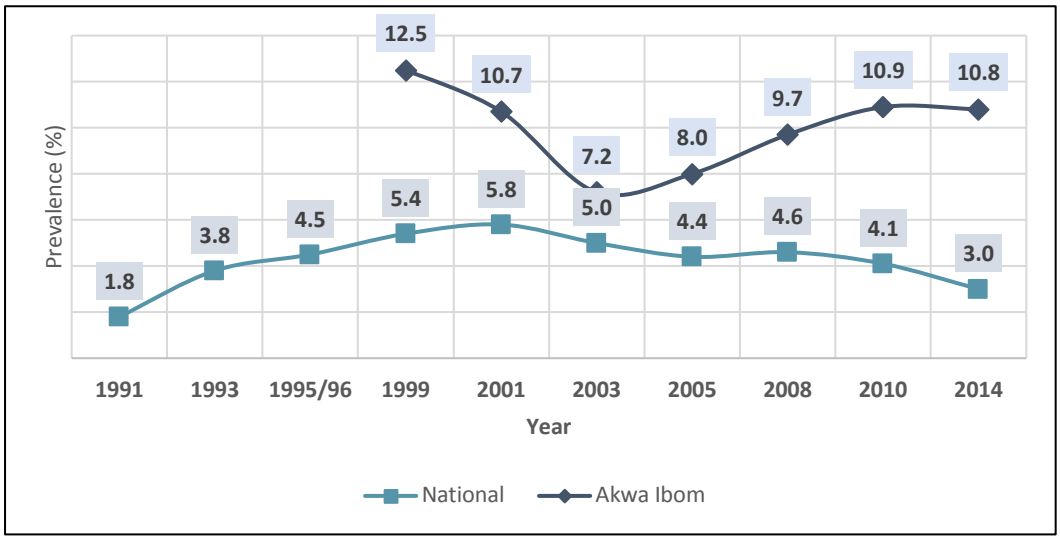


Figure 1-1. HIV prevalence trend from ANC Surveys (national and Akwa Ibom State)

The National HIV/AIDS and Reproductive Health Survey (NARHS) conducted among the adult general population (females 15–49 years and males 15–64 years) reported a slight decline in HIV prevalence in Nigeria from 3.6 percent in 2007 to 3.4 percent in 2012.[5 6] The prevalence in 2012 was slightly higher in rural (3.6 percent) than urban (3.2 percent) areas.[6] The highest prevalence according to the NARHS 2012 was reported in Rivers State (15.2 percent) and the lowest in Ekiti State (0.2 percent); Akwa Ibom State had the sixth highest prevalence (6.5 percent).[6]

The Integrated Biological and Behavioural Sentinel Survey (IBBSS) is typically conducted among subpopulations considered to be at higher risk of sexually transmitted infections (STIs). Females who sell sex — both brothel- and non-brothel-based — men who have sex with men (MSM), people who inject drugs (PWID), transport workers, members of the armed forces, and the police. Key populations contribute disproportionately to the HIV epidemic in Nigeria; findings from the 2014 IBBSS showed that the overall prevalence among key and vulnerable populations was 9.5 percent.[7] Prevalence among brothel-based females who sell sex in 2014 was 19.4 percent, representing a decline from 27.4 percent in 2010; non-brothel-based females who sell sex had an estimated prevalence of 8.6 percent, showing a marked decline from 21.7 percent in 2010.[7 8] The 2014 prevalence among PWID was 3.4 percent declining from 4.2 percent in 2010; the prevalence among MSM, however, increased from 17.2 percent in 2010 to 22.9 percent in 2014.[7 8] The prevalence rates for all these groups showed a decline from 2010 estimates except for MSM. In addition to reflecting a markedly higher prevalence than the general population, linkages between key populations and the general population are drivers of new HIV infections in Nigeria.

The HIV program has also continued to reach more people. Putting these survey findings and program data together into Spectrum®, the Joint United Nations Programme on HIV/AIDS (UNAIDS) reported that since 2010 in Nigeria, new HIV infections have decreased by 21 percent, and AIDS-related deaths have decreased by 6 percent.[9]

1.1.3 Current epidemic in Akwa Ibom State

Akwa Ibom State is located in the South-South region of Nigeria (Figure 1-2) with a 2016 projected population of 5,482,177 million derived from the 2006 census population census.[10] Akwa Ibom State occupies a landmass of 8,412 square kilometers and is bounded in the north by Abia State, in the east by Rivers State, in the west by Cross River State, and in the south by the Atlantic Ocean, and it has the longest coastline in Nigeria.[10] Akwa Ibom State consists of 31 local government areas (LGAs) which are further divided into 329 political wards. The major ethnic groups present are Ibibio, Annang, and Oron.[10] The state is one of the largest producers of crude oil in Nigeria and is of major economic importance in the country.[11]

Figure 1-2. Map of Akwa Ibom State showing the senatorial districts and local governments

1.1.4 HIV and AIDS response in Akwa Ibom State

Akwa Ibom State Agency for the Control of AIDS (AKSACA) is responsible for the effective coordination of HIV and AIDS services in Akwa Ibom State. AKSACA was created from an HIV and AIDS committee in 2012 to use a multi-sectoral approach to organize an effective and coordinated response to HIV and AIDS, integrating both health and non-health-sector stakeholders.[12] AKSACA coordinates all HIV and AIDS activities at the state level while the Local Action Committees on AIDS (LACA) does the same at the local government level. AKSACA also works with implementing partners, LACA, technical working groups, support groups, and volunteers to ensure effective HIV and AIDS program coordination in the state.[12]

The State Ministry of Health through the State HIV/AIDS and Sexually Transmitted Diseases Control Programme coordinates the health-sector component and other line ministries, and civil society organizations (CSOs) drive the non-health-sector components within the state.
AKSACA has driven HIV interventions at the rural level by strengthening the capacity of LACA to coordinate HIV services effectively. The agency's monitoring and coordination activities have been constrained by a lack of funds, as the state-level HIV response is highly donor driven.

HIV services are provided within primary, secondary, and tertiary health care facilities ranging from government-owned, to private, to faith-based, spread across the 31 LGAs of the state. Provider-initiated testing services for HIV and AIDS are provided by these facilities, but some hard-to-reach areas are not effectively served with HIV and AIDS services due to barriers relating to physical access to these areas. By the end of 2016, there were 413 HTS facilities, 423 PMTCT facilities, and 78 antiretroviral therapy (ART) facilities offering HIV and AIDS services in the state.[12]

1.1.5 HIV prevalence in Akwa Ibom State

The HIV prevalence in Akwa Ibom State as shown in Figure 1-1 declined steadily from 12.5 percent in 1999 to 7.2 percent in 2003. This was followed by a steep rise to 10.9 percent in 2010, stabilizing at 10.8 percent in 2014.[13]

ANC survey data for 2010 and 2014 showed that Akwa Ibom State was among seven and eight states, respectively, in Nigeria with a higher HIV prevalence in rural than urban sentinel sites.[13 14] The mean urban HIV prevalence in 2014 was 9.8 percent and the mean rural prevalence was 12.8 percent; these were the highest rural and urban prevalence rates for sentinel sites in the South-South zone of Nigeria.[13] Specifically, the highest rural and urban HIV prevalence in South-South were found in sentinel sites in Iquita-Oron (18.4 percent) and Essien Udim (10.7 percent), respectively, both of which are located in Akwa Ibom State.[13] The sentinel site in Oron recorded the highest rural prevalence in Nigeria in 2005 (Figure 1-3), and the rates have been consistently high.[13] Contextual or demographic drivers of HIV specific to this site may account for the higher prevalence.

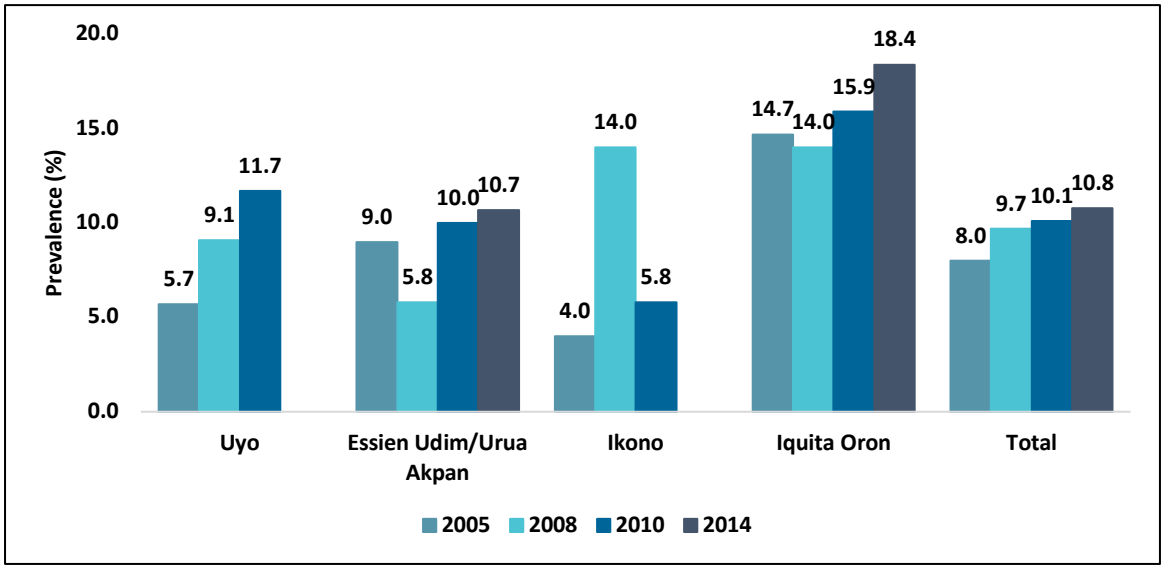


Figure 1-3. HIV prevalence at rural/urban sentinel sites in Akwa Ibom State (ANC Surveys 2005–2014)

ANC survey data for 2008 showed that Akwa Ibom had the highest rural prevalence in Nigeria among women ages 15–24 years (13.8 percent) and was the only state with higher rural than urban prevalence in the South-South region for the same age group.[15]

1.1.6 HIV program positivity rates

There are no recent surveys to provide an indication of current HIV prevalence in Akwa Ibom State. Facility-based HIV counseling and testing (HCT) data provide insight on the uptake of HIV testing at the facility level and the positivity rates. NASCP 2015 data showed that the HIV positivity rate was 4.5 percent for Akwa Ibom, 4.1 percent for South-South, and 3.5 percent for National.[1]

HIV positivity rates disaggregated by age from NASCP 2016 showed that the highest proportion of the population that tested positive for HIV across all HCT facilities in the state were females ages 25–49 with a positivity rate of 4.9 percent. Facility-level HCT data for 2016 show the positivity rate as 2.1 percent for males, 3.5 percent for females Figure 1-4), and 2.8 percent for total tested.[1] The number of people who had HCT in Akwa Ibom increased from 532,602 in 2015 to 1,337,614 in 2016.[16]

Program data from SIDHAS-supported facilities from April 2007 to March 2017 show that 4 percent of males and 6 percent of females tested positive for HIV. A total of 1,362,303 people were screened for HIV, and females who tested for HIV numbered twice as many as the males. Although this does not provide the full spectrum with respect to facility-based testing, it is indicative of the facility-based positivity rate.

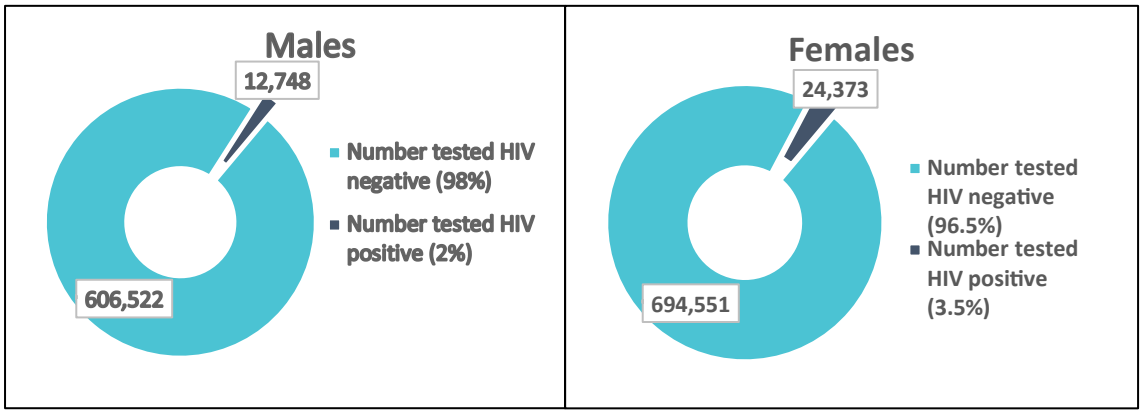


Figure 1-4. HIV positivity rate by gender in Akwa Ibom State (NASCP 2016)

Trends in the HIV positivity rate from routine HTS data in Akwa Ibom State from 2013 to 2016 show an increase in the number of people who had HCT from 64,777 to 1,337,614 and a decrease in the positivity rate from 12.3 to 2.8 as shown in Figure 1-5.

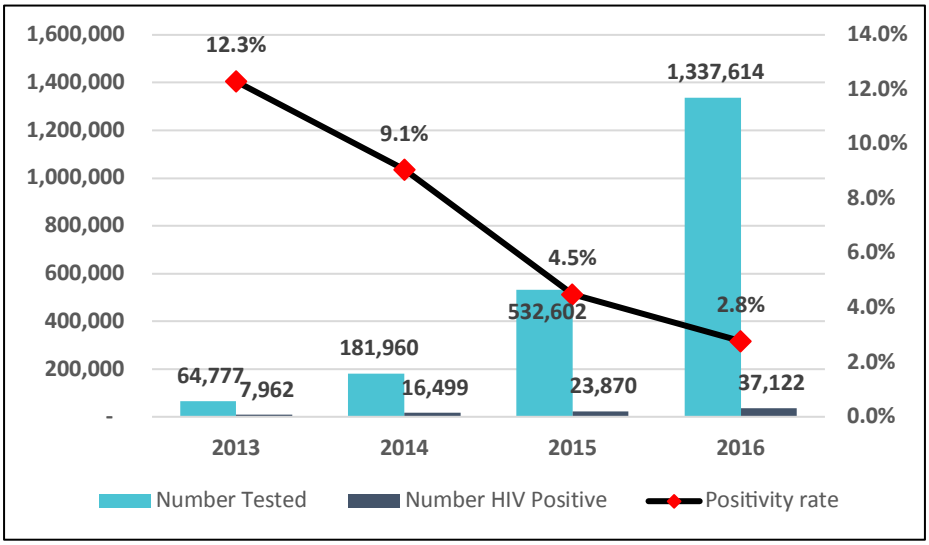


Figure 1-5. Trends in HIV positivity rate in Akwa Ibom State 2013–2016

1.1.7 HIV prevalence among key/vulnerable populations in Akwa Ibom State

There are also limited data on the HIV prevalence of key populations in Akwa Ibom State. The 2010 Modes of HIV Transmission (MOT) survey reported that sex workers contributed 3.8 percent of new infections in Akwa Ibom State, MSM 3.6 percent, and PWID 1.7 percent.[17] Akwa Ibom State did not participate in the IBBSS, but data from Cross River, a contiguous state with similar culture, show that in 2014, HIV prevalence was 13.5 percent among brothel-based females who sell sex, 9.5 percent among non-brothel-based females who sell sex, 11.3 percent among MSM, 5.8 percent among PWID, 3.8 percent among police, 0.7 percent among the armed forces, and 3.3 percent among transport workers.

According to the Nigeria Demographic and Health Surveys (NDHS) 2013 report, Akwa Ibom also had the highest proportion of children orphaned by and/or vulnerable to HIV (23.3 percent) in Nigeria. The South-South region's average was 13.6 percent, and the national average was 8.5 percent.[17] Whereas the proportion of orphans and vulnerable children declined slightly in the South-South region from 13.7 percent in 2008 to 12.7 percent in 2013, there was a near two-fold increase in Akwa Ibom State from 13.6 percent in 2008 to 23.3 percent in 2013, a reflection that the State is the major driver of orphans and vulnerable children in the region.[17 18] The survey did not capture orphans and vulnerable children that were institutionalized or living on the streets, implying that the true situation may be higher. The increase in orphaned or vulnerable children may reflect a growing impact of the HIV epidemic in the state.

1.1.8 Key social and behavioral drivers of HIV epidemic in Akwa Ibom State

The various social and behavioral factors that drive HIV transmission need to be holistically identified and incorporated into HIV prevention goals to effectively address population needs.

Behavioral factors

Multiple sexual partnerships carry significant risk for HIV transmission.[19] Findings from the NARHS 2012 show that the proportion of sexually active females in Akwa Ibom State who ever had multiple sexual partners was 23.1 percent compared with 14.3 percent in South-South and the national average of 8.7 percent.[19] About 95 percent of these females with multiple sexual partners had sex in the preceding 12 months.[19] The mean number of lifetime sexual partners reported by females in Akwa Ibom State was 2.1 in South-South and 1.5 in Nigeria.[17] The mean number of lifetime sexual partners for males in Akwa Ibom was 4.4 compared with the regional average of 6.9 and the national average of 4.1.[17] The number of sexual partners reported in the NDHS 2013 increased with increasing education and wealth index.[17]

The risks in multiple sexual partnerships are increased by the fact that they tend to occur with non-marital, non-cohabitating partners. Seventy five percent of women ages 15–24 years had ever had sex in Akwa Ibom State compared to 51 percent in South-South and 46.6 percent in Nigeria, according to results of the Multiple Indicator Cluster Survey (MICS) 2011.[20] Over 70 percent of those who had ever had sex in Akwa Ibom did so with a non-marital, non-cohabitating partner, and less than half had used condoms at the last sex. The findings in Akwa Ibom State were higher than regional and national averages.[20] Research on HIV transmission in Nigeria suggests that the highest proportion of infections occur within spousal/cohabitating sexual relationships.[21] Although these relationships are generally considered low risk, over 40 percent of HIV transmission occurs among this population because multiple concurrent sexual partners by a spouse/cohabitating partner, as well as low condom use, significantly increase risk.[21]

The exchange of money or gifts for sex is bidirectional, occurring from males to females as well as the reverse.[19] The HIV prevalence reported in the NARHS 2012 among people who had exchanged sex for money or gifts was highest in the South-South region for males (7.7 percent) and females (7.1 percent) compared to the national average for males (5.1 percent) and females (4.9 percent).[19]

The median age at first intercourse is a better indicator for sexual and reproductive risk exposure than age at first marriage because it accounts for those who become exposed through sexual contact before marriage.[17] In Akwa Ibom State, the median age at first sex (females 15, males 16) was lower than South-South (17 years for males and females) and national averages (17 for both males and females).[19] The proportion of female youth ages 15–24 who had sex before the age of 15 as per the NDHS in Akwa Ibom State was 21.7 percent compared to 12 percent for South-South and 15.7 percent nationally in 2008. This declined in 2013 to 16.3 percent for Akwa Ibom and 10.8 percent for South-South and slightly increased to 17 percent nationally. Up to half of female youth ages 18–24 had had sex before the age of 18 years in 2008, the highest being Akwa Ibom (57 percent); this slightly declined to 53.6 percent in 2013. These values were lower for males.

Research has documented strong and consistent linkages between hazardous alcohol use and increased sexual risk for HIV transmission in Africa.[22] [23] Everyday use of alcohol in Akwa Ibom reported in the NARHS 2012 was 12.3 percent compared to 6.2 percent for South-South and 3.6 percent nationally.[19] Use of alcohol at least once in the previous four weeks was higher in Akwa Ibom (29.1 percent) than South-South (20.8 percent) and in Nigeria (10.9 percent).[19]

Risk perception is an important driver of willingness to actively participate in personal protection against HIV. Findings from the MOT survey from 2011 showed that over half of new infections in Akwa Ibom were from low-risk heterosexual sex, and one-third were from casual heterosexual sex.[24] This was higher than the national average of 42.3 percent and 9.1 percent, respectively.[24] About two-thirds of respondents in the NARHS 2012 perceived that they had a low chance of contracting HIV.[19] Figure 1-6 shows the distribution of new HIV infections by modes of exposure in Akwa Ibom State.

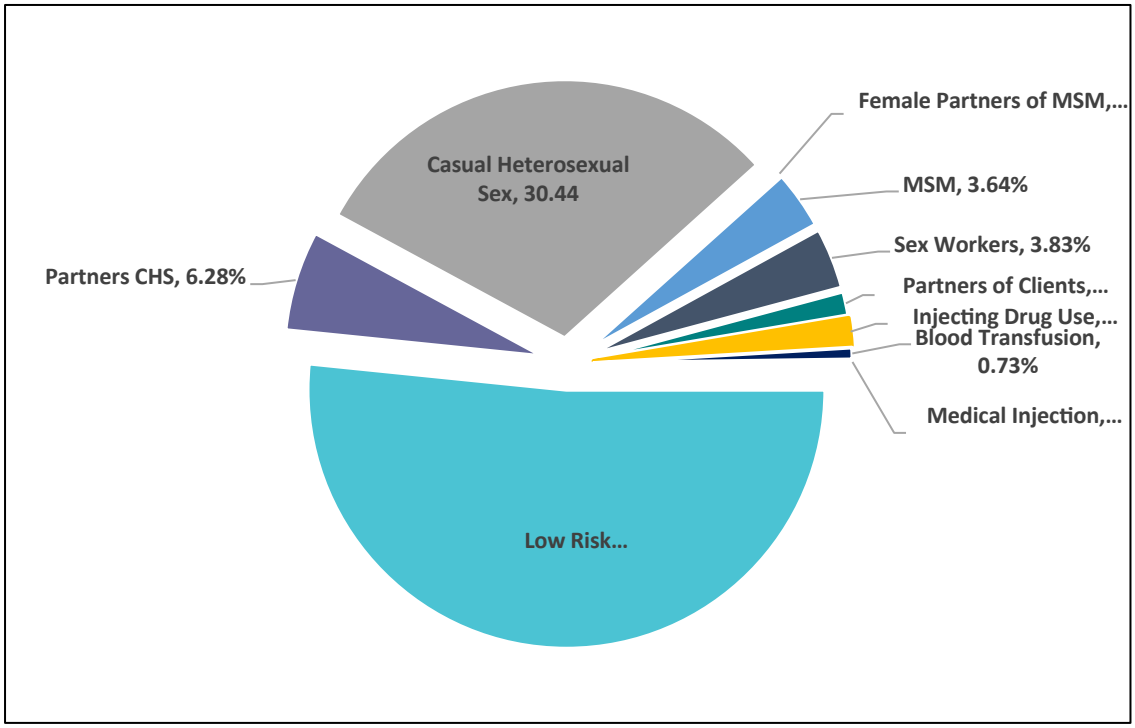


Figure 1-6. Distribution of new infections by modes of exposure in Akwa Ibom State

Sociocultural factors

A wide range of sociocultural factors contribute to HIV risk in Akwa Ibom.[18 19 20] Formal surveys and assessments such as MICS and a Gender Assessment by FHI 360 describe factors such as the majority of women believing that their husbands were justified to beat them, an inclination to seek spiritual healing rather than medical care, and a preference for delivery with traditional birth attendants (TBAs) rather than skilled birth attendants.[19 20] Predominant is also a belief in supernatural causes of illness, including witchcraft.[25] Findings from a qualitative exploration of sociocultural practices and maternal health outcomes showed that religious beliefs about supernatural determinants of misfortune delayed health seeking even in the face of complications.[26] Misconceptions about how to avoid HIV reflect the tendency to defer to cultural and religious beliefs as shown in Figure 1-7.

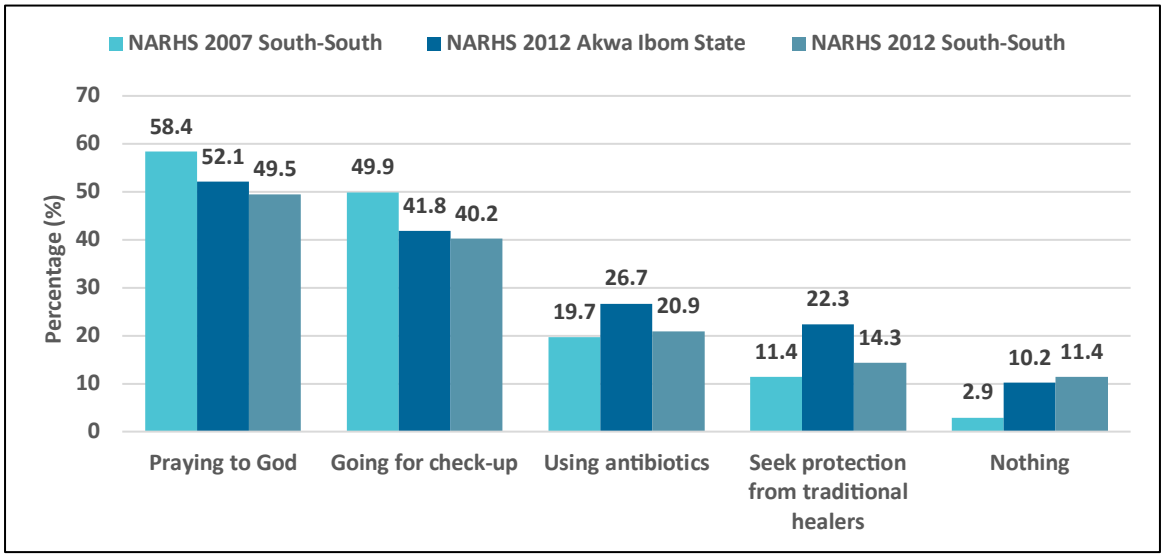


Figure 1-7. Misconceptions about how to avoid HIV

1.1.9 Gaps in knowledge about the HIV epidemic in Akwa Ibom State

There are gaps in what is currently known about the HIV epidemic in Akwa Ibom State. Knowledge about the HIV prevalence among key populations, as well as the linkages between key populations and the general population, is necessary to facilitate focused planning and targeted interventions for HIV prevention. Targeting groups at high risk of HIV transmission requires a better understanding of policy and structural barriers that hinder their access to HTC services. A clear understanding of the epidemiology of new infections and geographic variations in the drivers of HIV transmission is key in program planning and implementation. Bridging the gaps in evidence regarding social and behavioral determinants of risk among low-risk heterosexuals and serodiscordance is also key to HIV programming. A well-coordinated HIV intervention program must be driven by an integrated strategy that addresses key risk areas.

1.2 Justification

Akwa Ibom State has been selected by the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) as one of the focus states for scaling up HIV control strategies in Nigeria, and evidence is required to guide planning, implementation, and monitoring of scale-up. However, available data from various sources are inconsistent, largely incomplete, and narrow in scope and coverage. This highlights the need for more precise measurement of HIV prevalence that is guided by the use of scientifically sound and context-specific methods to generate data that are representative in terms of scope and coverage, and very importantly, useful for decision making. The AKAIS is one of the first HIV-focused, population-based surveys to be implemented in Nigeria and its findings disseminated.

AKAIS was designed to fill gaps in HIV data, as well as provide evidence-based guidance for the design of future HIV control activities in the state. Some specific HIV data gaps AKAIS was designed to fill are: (i) precision in measurement of prevalence using a representative sample at the LGA level; (ii) HIV incidence among people ages 19 months and older; (iii) cluster of differentiation 4 (CD4) cell count and viral load among HIV-infected people; (iv) access, coverage, and uptake of HIV care and treatment services; (v) demographic, socioeconomic, and behavioral risks factors that drive the HIV epidemic; and (vi) knowledge about and attitudes toward HIV.

AKAIS is unique in that it involves measurement of HIV-specific biomarkers, such as viral load and CD4 cell count. Community viral load shows the number of unsuppressed patients who are potentially transmitting the virus in a given community and also gives an indication of the quality of programmatic access for those enrolled in care and treatment. Population-level CD4 cell count provides the total number of people in need of treatment, a more accurate measure of unmet need and demand for ART. Additionally, AKAIS is the first HIV-incidence measurement study to be conducted in Nigeria. Being a population-based survey, AKAIS provides more accurate data on the burden of HIV and uptake of PMTCT services among pregnant women, given that a significant proportion of pregnant women seek care from informal health providers. The survey also collected pediatric data that provide insight into HIV epidemiology in children.

AKAIS incorporated an approach of providing HTS, counseling, and referral of all cases at the time of the interview in the household setting (to avoid potential stigmatization). This enabled those who chose to participate to learn about their status and, if positive, be appropriately referred to a service provider.

1.3 Survey aim and objectives

The purpose of AKAIS was to generate population-based HIV data through a state-level representative survey of children and adults, from birth and upward, to inform the HIV program response in Akwa Ibom State. The information from the survey will be valuable to program managers and policymakers as it provides clear evidence regarding the burden of HIV in Akwa Ibom State, will guide the scale-up of treatment and prevention services across all age groups, and provides the information needed for evaluation of current and future programs. AKAIS was adapted from the CDC's HIV Impact Assessments (HIAs) and serves as a model survey to other Nigerian states for population-based, HIV-focused studies involving comprehensive biologic testing.

Overall aims

The overall aims of AKAIS were to generate valid data that describe the burden of HIV and to measure access to, use of, and unmet need for HIV intervention services among adults and children, in order to improve HIV program intervention effectiveness through an evidence-informed HIV response in Akwa Ibom State, Nigeria.

Primary objectives

The primary objectives were:

1. To estimate the prevalence of HIV among people ages 15 years and older in Akwa Ibom State
2. To estimate the prevalence of HIV among children ages 0 months–14 years in Akwa Ibom State
3. To determine the coverage of and unmet need for HIV intervention services in Akwa Ibom State

Secondary objectives

1. To estimate the incidence of HIV in Akwa Ibom State
2. To describe the demographic, socioeconomic, and behavioral risk factors associated with the HIV epidemic in Akwa Ibom State

Study outcomes

Primary study outcomes

- HIV prevalence
- Coverage of HIV intervention services
- Unmet need for HIV intervention services

Secondary study outcomes

- HIV incidence
- HIV-related knowledge and risk behaviors

Chapter 2:

Overview of Methods

2.1 Study area and study population

2.1.1 Study setting

This study was conducted in all 31 LGAs of Akwa Ibom State.

2.1.2 Target populations

The study population was comprised of household residents in Akwa Ibom State. Specific population subgroups covered by the AKAIS were children ages 0–18 months, children ages 18 months–9 years and 10–14 years, and women and men ages 15 years and older.

For this survey, a household resident was defined as an individual who:

> Had been sharing a physical structure such as a compound or homestead and who had been consuming or making some contribution to food and other shared household resources and or who stayed in the household on the previous night

AND

> Was listed by the head of household on the Household Schedule as being a household resident or an overnight guest on the previous night.

All other individuals in the house were considered visitors and were ineligible to participate in the survey.

2.1.3 Inclusion and exclusion criteria for household residents

Household residents were eligible for study inclusion if they met one of the following criteria:

- Children ages 0 –18 months with parental/guardian's consent for dried blood spot (DBS) collection onto DBS cards and rapid HIV testing
- Children ages 19 months–9 years with parental/guardian's consent for venous blood draw and HIV rapid testing
- Children ages 10–14 years with parental/guardian's consent and who assented for the questionnaire, venous blood draw, and HIV rapid testing
- Women and men ages 15–17 years with parental/guardian's consent and who assented for the questionnaire, venous blood draw, and HIV rapid testing
- Women and men ages 18 years or older and mature minors ages 15–17 years of age who consented to the questionnaire, venous blood draw, and HIV rapid testing. (Mature minors are people ages 15–17 who are no longer under the care of a parent or guardian.)

People excluded from eligibility to participate were:

- People who did not consent or assent to participate in the survey
- People ages 0 months–18 years whose parent/guardian did not provide consent, where applicable
- Presence of cognitive or other disabilities, such as deafness, that would preclude them from consenting or participating in the survey

2.1.4 Inclusion and exclusion criteria for household heads

The heads of households were adults ages 18 years or older whom other household members considered to be the head of the household and who would provide consent for the household survey. In the absence of adult household members, mature minors ages 15–17 years were considered to serve as the head of the household.
Minors who were 14 years of age or less, with no adult or guardian present, were not eligible to give consent for the household survey and such households were excluded.

2.1.5 Survey design and sampling

A population-based, cross-sectional survey was conducted at the household level in all the 31 LGAs in Akwa Ibom State, Nigeria to produce unbiased estimates of HIV prevalence and incidence, and to identify the risk factors (demographic, socioeconomic, and behavioral) and household characteristics associated with the HIV epidemic in the State. Information on household characteristics and the behavioral data of household residents were collected using questionnaires. Blood samples were collected from participants to obtain biological information on HIV.

A two-stage probability sampling technique was employed in selecting participants from a frame of eligible household residents of Akwa Ibom State. The primary sampling unit was census enumeration areas (EAs) as defined by the National Population Commission (NPC) during the 2006 Census. At the first stage, samples of clusters (EAs) were selected with proportional allocation of samples. The first-stage sample of EAs and their sampling weights were provided following a household mapping and enumeration exercise, as this information had not been updated since the last census in 2006. A total of 226 EAs was selected. Households were ordered by geographic location prior to household selection, and the final EA size used was the actual number of households within the EA obtained through the household mapping and enumeration. At the second stage of sampling, a fixed percentage of households were sampled from each selected EA using systematic sampling. All eligible members of the household were included in the survey.

2.1.6 Weighting of the sample

Three sets of weights were calculated: one set for the households, one set for the individual interview and blood draw for children and adolescents, and a third set for the individual interview and blood draw for adults. The final weights were normalized in order to give the total number of unweighted cases equal to the total number of weighted cases for both household weights and individual weights. The response rate to HIV testing was calculated as the total number of individuals interviewed and tested divided by the total number of eligible individuals for HIV testing.

2.1.7 Data collection tools

Questionnaires

Three questionnaires were used in the field during AKAIS: (1) a household questionnaire, (2) an individual adolescent questionnaire for individuals ages 10–14 years, and (3) an individual adult questionnaire for women and men ages 15 or older. The contents of these questionnaires were adapted from the CDC-HQ questionnaires developed to guide HIA surveys and were modified to address local priorities.

The household questionnaire gathered basic information from the head of the household or a representative on usual members and visitors in the household, including their age, sex, education, and relationship to the head of household. Information was also collected to assess household socioeconomic characteristics, such as ownership of household assets and the nature of the dwelling unit/abode, access to basic amenities such as drinking water and method of water purification, cooking fuel, toilet facilities, and electricity. Information was also collected on whether the household had received specific types of care and support for any chronically ill adults and adolescents, and on any household members who had died.

The individual adolescent and adult questionnaires collected information from eligible adolescents and adults ages 15 years and older on basic demographic characteristics, reproductive history, marriage, sexual activity, fertility, and family planning use. In addition, the tool included questions regarding HIV and STI knowledge, attitudes and behaviors, HIV testing, HIV care and treatment uptake, and other health issues such as tuberculosis, blood donation, and medical injections. The same questionnaire was used for women and men. Questions pertaining to children 0 months–14 years were also embedded in the individual questionnaire for adults, and data were provided by their parent or guardian.

A separate questionnaire for adolescents ages 10–14 was administered to eligible participants in this age group. Information was collected on demographic characteristics; HIV knowledge, attitudes, and risk perception; circumcision status; HIV testing; alcohol and drug use; participation in prevention interventions; and HIV stigma perceptions. Adolescents ages 12–14 years were additionally asked questions about sexual activity, social norms, abstinence, self-efficacy, and assertiveness.

Various stakeholders worked within the AKAIS technical team to modify existing questions and design new questions that reflected current and emerging issues in HIV and AIDS in Nigeria. Details of the questionnaire modules are illustrated below in Table 2-1.

Table 2-1. Detailed description of questionnaire modules for AKAIS

Questionnaire Modules	Household (Self-reported by head-of-household)	Individual questionnaire for women and men ages 15 years or older		Individual questionnaires for children ages 10-14 years	
		Men ≥ 15 years (Self-reported)	Women ≥ 15 years (Self-reported)	Children 10-11 years (Self-reported) *	Children 12-14 years (Self-reported)
Household schedule	X				
Characteristics for eligibility	X				
Household characteristics for wealth index	X				
Demographic characteristics		X	X	X (partial)	X (partial)
Reproduction and family planning/ contraception		X (contraception method only)	X		X (partial)
Marriage/partnerships		X	X		
Sexual activity		X	X		X(partial)
HIV/AIDS knowledge and attitudes (and risk perception)		X	X	X	X
HIV testing		X	X		X (partial)
HIV care and treatment (including disclosure)		X (persons who self- report HIV-positive)	X (persons who self-report HIV-positive)		
Blood safety, medical injection and injection drug use		X	X		
Male and female circumcision		X	X		
Non-prescription drug use		X	X		X (partial)
Characteristics of children ages 18 month-14 years living in the household		X	X		

Electronic data capture

Electronic data capture into Android-based portable tablets was employed using Census and Survey Processing System (CSPro) software. Data were transferred from survey team members to the central server (HP DL380p G8 Intel Xeon E5-2609 (Quad-core, 2.40 GHz, 10MB, 80W) 1 processor, 8GB RAM, 2 x 300GB) using secured virtual private network (VPN), external network access over a 3G wireless mobile phone network, or a Wi-Fi-generated "hotspot." All data were fully backed up on the FHI 360 central server in real time using cloud technology, with differential backups performed daily.

The survey team processed a single household survey session from multiple data entry points. The CSPro software template was designed such that all questionnaire modules were available in each tablet as appropriate, and several interviewers could attend to various household members concurrently. Barcodes with unique specimen identification numbers were printed in real time within the households by the survey team and placed on laboratory specimens. The barcode information was also placed on the individual consent forms and entered into the participant's data o enable accurate merging of laboratory (biological) data and individual questionnaire (behavioral) data.

2.1.8 Biological specimen collection

To collect blood samples from adults, 9 ml ethylenediaminetetraacetic acid (EDTA) vacutainer tubes and DBS Whatman 903 filter paper (GE Healthcare) were used, as appropriate, and are described in subsequent sections of this report. Blood samples from HIV-exposed infants were collected using the DBS cards (Munkell – TFN) used in the national early infant diagnosis (EID) program.

2.1.9 Survey implementation

The procedures that were used for community mobilization, household enumeration, pilot survey, training of facilitators and enumerators, and actual data collection are described in the following subsections.

Community mobilization and sensitization

Extensive community mobilization and stakeholder engagements were undertaken before AKAIS commenced to ensure participation, ownership, and cooperation of communities and households. AKSACA coordinated the community mobilization activities. The agency used existing social mobilization structures in the state to sensitize communities about the survey. Sensitization was done at the state, LGA, and village levels to ensure adequate coverage. A social mobilization working group comprised of representatives from the National Orientation Agency, AKSACA, FHI 360, and other collaborating institutions (University of Nigeria Nsukka and University of Uyo Teaching Hospital [UUTH]) was created to provide technical assistance and participate in the implementation of all communication and mobilization activities. This group collaborated with local faith-based organizations and community-based organizations such as the Civil Society for HIV/AIDS in Nigeria (CISHAN) and the Network of People with HIV/AIDS in Nigeria (NEPWAN) in the implementation of community mobilization. They were also responsible for a high-level launch of AKAIS at the state level, targeting key state and regional leaders, mass media, and other stakeholders to create awareness and ensure state ownership of the survey before commencement. Several key stakeholder engagement meetings were held prior to the kickoff of AKAIS. These engagements allowed areas of concern and issues that were either misunderstood or stigmatized to be addressed, and clarity to be provided to stakeholders on organization and the management of the survey process.

Mobilization at the community and cluster levels was undertaken shortly before commencement of fieldwork in each cluster. In each cluster, a local mobilization team was created, consisting of the LGA social mobilization officer, a representative of National Orientation Agency, a women's leader, and a youth leader. Local mobilization was done using local radio stations, public meetings, churches, town

announcers, schools, and print materials (e.g., press releases, posters, banners, and brochures distributed in strategic locations in the clusters) to facilitate communication about the survey in the cluster. During fieldwork, the Social Mobilization Working Group monitored mobilization efforts for all clusters and addressed emerging issues and misconceptions that may have affected community participation in the survey.

Household mapping and listing

At the end of the mapping and listing, a detailed database was created of the current households in the sampled EAs, including their addresses, names of heads of household, names of members of the households, and their age and sex. The global positioning system (GPS) coordinates were also entered in the database. This list was used for second-stage probability sampling (with equal chance) of all households participating in the final survey. Also, a sketch map of the clusters indicating all buildings and other landmarks was produced for use in tracing sampled households during the actual survey. Map of Akwa Ibom state showing the distribution of sampled households is presented in Figure 2-2.

A total of 8,772 households with a population of 31,908 people were listed. There was an average of 3.6 people per household following the listing as compared to an actual average of 4.0 people per household at the end of the survey and 4.5 people per household for Akwa Ibom State found in the 2006 population census. [27]

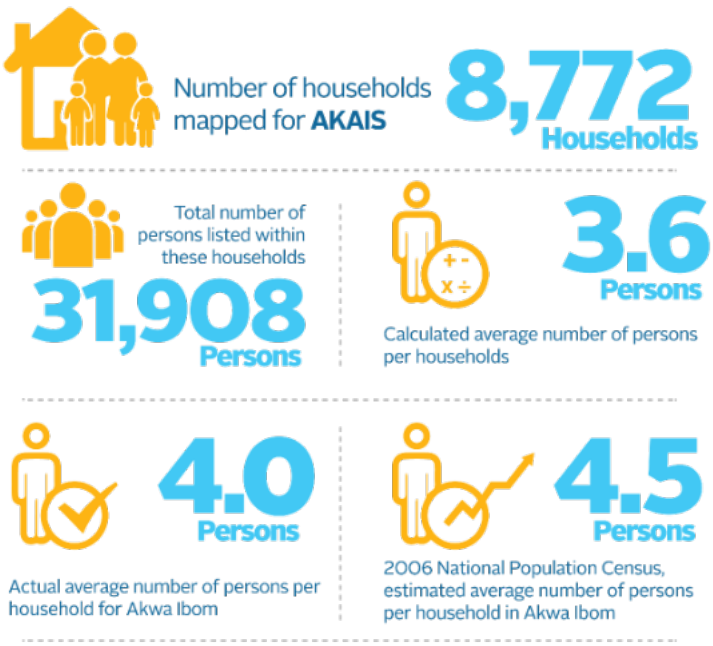


Figure 2-1. Estimated and actual average household size for Akwa Ibom

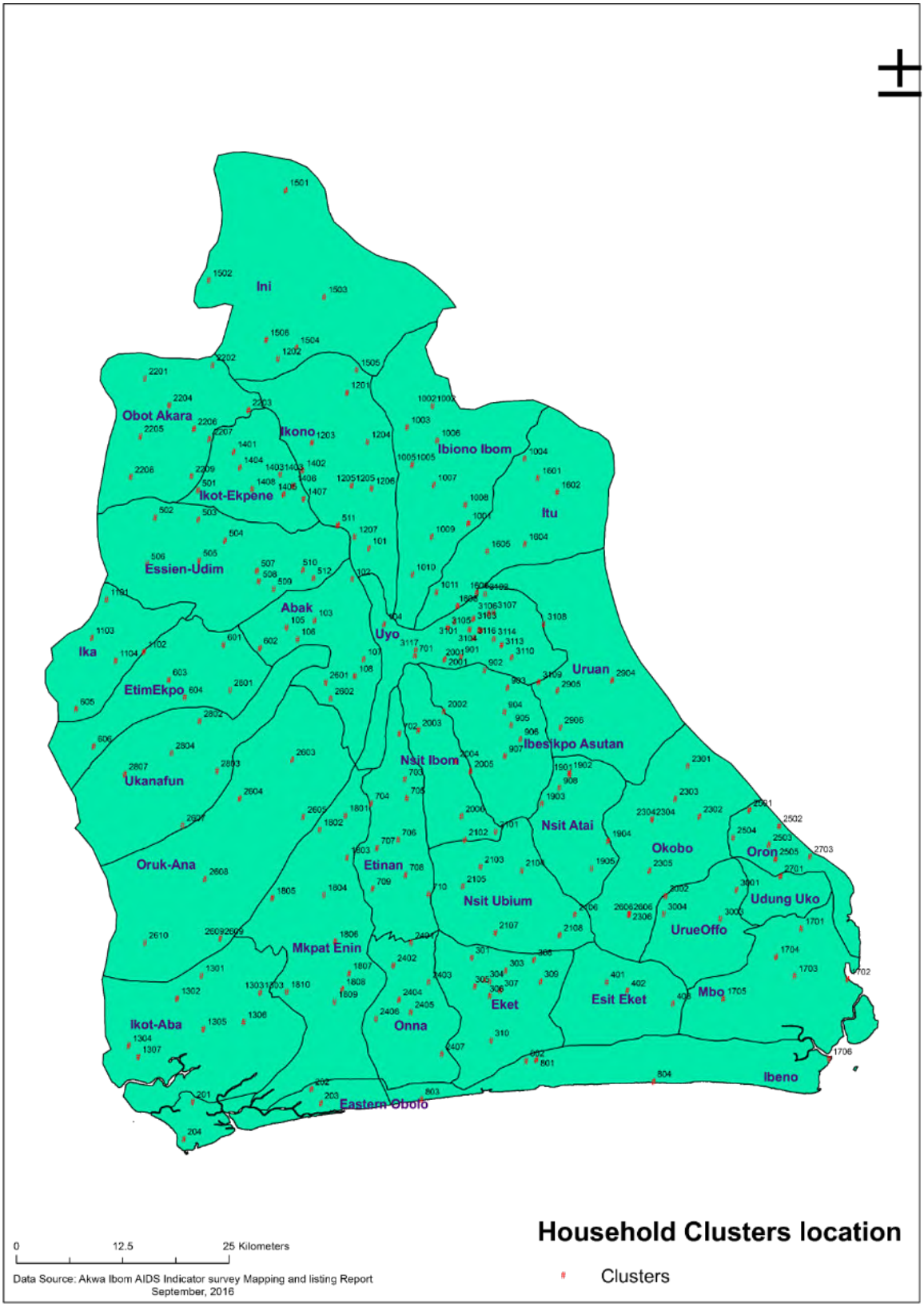


Figure 2-2. Map of Akwa Ibom showing sampled households in different clusters

2.1.10 Pilot survey

A pilot study was conducted in six EAs in Akwa Ibom State that were not in the sampled clusters. The purpose of the pilot study was to test the data collections tools, standard operating procedures (SOPs), field manuals, laboratory procedures, and other field methods. The pilot study assisted the AKAIS team in identifying potential problems that could arise during the actual fieldwork. It also provided an opportunity to address these potential issues before the main study was rolled out.

2.1.11 Central-level training of facilitators and enumerators

The AKAIS data collection was implemented by 68 teams of field workers. Each survey team was comprised of eight people – one team leader (supervisor), three interviewers, one HTS service provider (counselor), one laboratorian, one household tracker, and one sample transport officer.

The AKAIS 2016 data collection personnel were trained in two phases, a seven-day training of trainers/facilitators and a ten-day training of enumerators. A total of 46 personnel consisting of facilitators and cluster managers were trained during the first phase. A total of 716 field supervisors, interviewers, registered medical laboratory scientists, certified HTS service providers, blood specimen transport officers, and household trackers were trained during the second phase.

2.1.12 Central operational bases

For efficiency of field operations, the Survey Technical Committee decided to divide the state into three central operational bases (COBs) based on the senatorial districts. The three COBs were:

I. Uyo Central Operational Base
II. Eket Central Operational Base
III. Ikot Ekpene Central Operational Base

The COBs enabled the field teams to be able to receive adequate and real-time support from the Survey Technical Committee and the field monitoring teams. The COBs had a full complement of data managers, information technology support, and laboratory support. The field operations were then implemented in COB structures. The 68 teams were then made to fall under one of the three COBs.

2.1.13 Household and head of household identification

Each team supervisor was given household numbers, names of heads of households, and cluster maps for his/her assigned clusters. This information was used to locate and identify the sampled households. Sampled households were identified by household trackers with the assistance of community gatekeepers and, when necessary, community leaders. The team supervisors then identified the head of household, introduced the purpose of the survey and survey team members, and determined whether the head of household was eligible to give consent. Eligible heads of households were adults ages 18 years and older, and mature minors ages 15–17 years. If the head of household was deemed eligible and mentally competent to give informed consent, a consent form was administered by the team leader/supervisor. If the head of household was deemed mentally

incompetent to give consent, an alternate adult head of household was sought. In the absence of an alternate adult head of household, the household was determined ineligible for the survey and no household substitutions were made. A summary flow of participants in the field is illustrated in Figure 2-3.

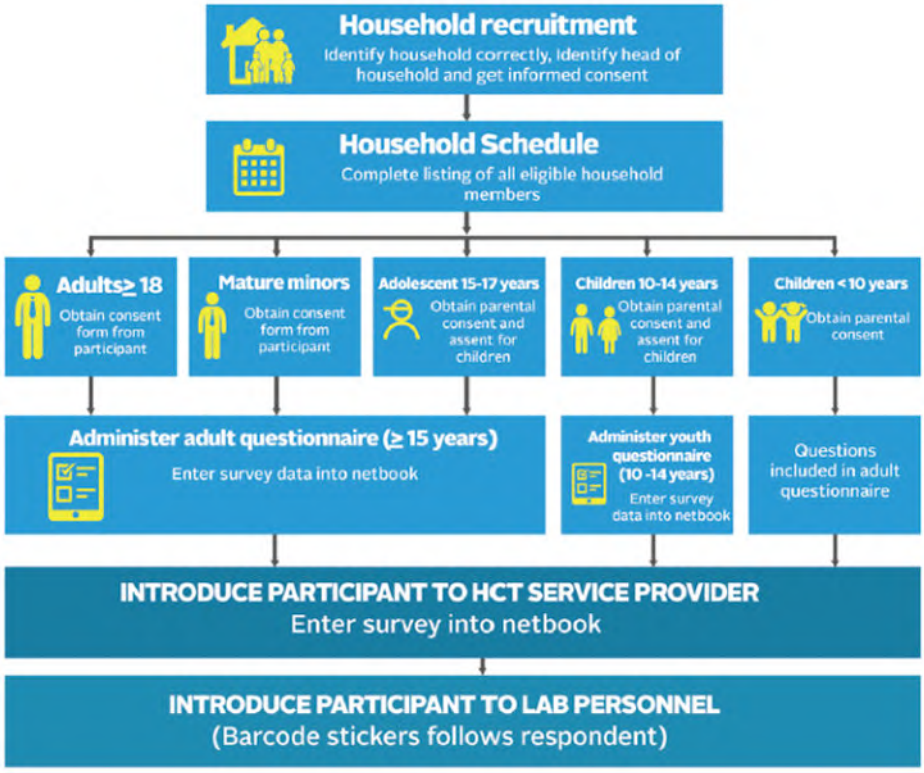


Figure 2-3. Flow of participants in the field for AKAIS

2.1.14 Household listing

Selected EAs and households were each assigned a unique identification number which served as the standard identification numbers for AKAIS. The EA unique identification number and household identification number were the only reference data with which a cluster could be located.
Any reference made to the AKAIS cluster in the study materials, such as in the household listing forms and maps, used the EA unique identification number to protect the privacy of the households and individuals.

The household questionnaire had a household listing schedule built into the CSPro software on the tablets and was used to identify all household heads and listed members of the household. As such, first names/nicknames of all individuals in the households appeared only on the household schedule.

2.1.15 Informed consent

Informed and written consent for the interview, specimen collection, and screening for HIV was sought for all eligible household members before participation in the survey. In the case of participants ages 10–17 years, consent was obtained from a parent/guardian before the child/youth was asked for his/her assent. Participants ages 15–17 years who were considered mature minors were allowed to provide consent on their own behalf. According to the national guidelines for HIV counseling and testing, mature minors are individuals under the age of 18 years who are married, pregnant, parents, or sexually active.[28] For the purpose of this survey, participants ages 15–17 years who were no longer under the care of a parent or guardian were also considered mature minors. For participants ages 0–18 months, consent was obtained from a parent/guardian for a DBS sample. For participants ages 19 months–9 years, consent was obtained from a parent/guardian for venous blood draw.

All participants provided written informed consent and had the choice to consent to the interview, the blood draw, HCT, and the storage of their specimens for future testing. Women and men ages 18–64 years were eligible to participate in the survey, provided that they gave their informed consent. For minors ages 10–17 years, parental or guardian consent and minor assent were both required for participation in the interview and the blood draw. Parental or guardian consent was required for children ages 0 months–9 years to participate in the blood draw. Those less than 18 years who were married, had children, or were pregnant were considered mature minors, using the criteria from the 2006 HIV Prevention and Control Act, and were able to provide their own consent to participate in the adult interview and blood draw.

2.1.16 Labeling of unique identifiers in the field

Barcodes were generated for each consenting participant. The barcodes served as the unique identifier. They were printed and placed on bracelets and were given to each participant to wear. Participants also received stickers with a matching bar code. These bracelet barcodes were scanned during administration of questionnaires and blood collection. Barcoded stickers along with the corresponding numbers (as a backup in case of failure of scanning technology) were placed on paper study documents and on specimens pertaining to study participants, such as venous blood tubes, DBS cards, and the sample tracking forms. The participant or the parent/guardian for participants under the age of 10 carried the set of barcode stickers to each data capture session (e.g., interview, venous blood draw, testing and counseling session) where the barcode was scanned into the tablet using a barcode reader.

All data capture sessions were conducted in private areas, indoors or outdoors, according to participants' preferences. The laboratory HIV results were anonymously linked via unique identifiers to individual survey results. The results of the HIV rapid test, viral load test, incidence testing, and future studies cannot be linked to any participants using the barcodes.

At the end of data collection from the household, the bracelets were removed from the participants' wrists and destroyed. The only link that was maintained during the survey was the results of the EID (polymerase chain reaction) PCR test to facilitate return of results for reactive participants 0–18 months.

2.1.17 Data collection

The data collection activity began immediately after the central-level training was completed. The 68 teams worked from the three COBs. The first step was self-introduction of the field survey team to the head of the household or a representative. This was followed by the team supervisor explaining the purpose and the components of the survey to the head of household or other appropriate adult respondent. Then, informed consent to collect data from the household was sought from the head of household or his/her representative. Once household consent was obtained, the field survey team supervisor administered the household schedule and questionnaire to the head of household or a representative. The household schedule was then used to determine eligible household members for the survey.

Following administration of the household questionnaire, field teams guided eligible participants through the consent process, as applicable to the participant, before administering the individual questionnaire. All eligible household members ages 18 years and older and the mature minors ages 15–17 years went through the individual adult consent process, as applicable. All other household members under age 18 years went through the parental/guardian consent and individual assent processes. Eligible participants provided written consent/assent to all of the following at the same time: (i) being interviewed about themselves; (ii) having a blood specimen drawn for centralized testing of DBS for HIV incidence testing, CD4 and viral load testing, central storage of remnant specimen, and future unspecified testing of stored specimens; and (iii) being tested in the household for HIV infection and providing results using the national HCT model.

2.1.18 HIV testing and laboratory methods

HIV counseling and testing (HCT)

The approach used for HIV testing in households was adapted from the National Guidelines for HIV Testing Services[28] and the WHO's Handbook for Planning, Implementing, and Monitoring Home-Based HIV Testing and Counselling.[29] The approach involved the following steps and is summarized in Table 2-2:

i. Pre-test counseling
ii. Blood sample collection
iii. Rapid HIV testing
iv. Post-test counseling
v. Referral and linkage to care

Table 2-2. Summary of HCT procedures for all age ranges for AKAIS

Home Based HIV Counseling and Testing					
Participants	**Infants 0 -18 months**	**Children 19 months -9 years**	**Youth 10 – 14 years**	**Adolescents 15-17 years**	**Adults 18 years and older**
Who consents for participation	Parents or Guardians	Parents or guardians	Parents or guardians	Parents or guardians, unless adolescent is no longer under the care of a parent or guardian in which case they consent for themselves	Themselves
Blood Collection	Heel or big toe stick	Collect 10 ml whole blood	Collect 10 ml whole blood	Collect 10 ml whole blood	Collect 10 ml whole blood
HIV Test	Rapid HIV-1/2 testing; PCR testing Determine only); PCR testing	Rapid HIV-1/2 testing	Rapid HIV-1/2 testing	Rapid HIV-1/2 testing	Rapid HIV-1/2 testing
Post-test counselling (who the result is disclosed to)	Parents or guardians	Parents or guardians	Parents or guardians	Individually Parents or guardians with the assent of the participant	Individually
Referrals and linkages to care (who the referral is given to)	Parents or guardians	Parents or guardians	Parents or guardians	Individually Parents or guardians with assent of the participant	Individually

Pre-test counseling

The HTS counselors at the household were trained to apply the National guideline on HTS protocols for survey respondents. Consenting participants or children whose parents/guardian provided consent were offered HTS. HTS procedures for different age categories of participants are presented in Appendix D. HIV counseling and testing with individual participants were held in private, either outside or at the back of the household structure or wherever was convenient and afforded confidentiality for the participant. Participants were identified using printed barcode labels, which were fixed to HIV request and results forms, questionnaires, and blood specimens.

Rapid HIV testing

Rapid HIV-1/2 testing was performed in the household using finger-prick samples following the national HIV testing algorithm (Determine – Unigold – Stat-Pak) on all consenting participants. Testing was done in a private location within the household premises. The results were recorded by the

counselor on a password-protected tablet using the unique identifier for the participant. Access to rapid test result data was restricted to designated team members who would use the information—i.e., the post-test counselor, medical laboratory scientist, and team supervisor.

Blood sample collection

For consenting participants 18 months and above who tested HIV positive, 10 ml venous blood samples were collected by medical laboratory scientists into EDTA bottles for further investigations in the laboratory, i.e., for CD4, viral load, incidence assay, and quality control (QC) retesting. Likewise, 5 ml venous blood samples were collected from 10 percent of all respondents in the household who tested HIV negative and those who were reactive only to Determine for QC retesting. The QC samples were collected from every tenth participant in the household who tested HIV negative.

After collection of whole blood and DBS samples at the household, the whole blood samples were packed in a triple-packaging format and transported by a trained sample transport officer to the nearest satellite laboratory inside a Jablo box. Also, the DBS cards collected for EID were taken along to satellite laboratories near each EA to dry, the cards were packed in gas-impermeable zip lock bags containing desiccant packs and humidity indicator cards.[30] The sample IDs were recorded on the sample transport log, which served as a tracker for sample transport.

Post-test counseling

Following the rapid HIV testing, reactive and nonreactive participants were given individual and private post-test counseling. During post-test counseling, mature minors ages 15–17 years and participants 18 years or older were told their rapid HIV test results verbally. Parents/guardians of children ages 0–18 months were given the HIV rapid test results for their children. All HIV-exposed infants ages 18 months or less had their specimens sent for confirmatory PCR testing. Parents of the infants were referred to the nearest health facility, where the EID results were sent for follow-up. Parents/guardians of children ages 18 months–9 years were given the HIV test results in the absence of the children, and the process for disclosure of test results to children was discussed and planned with the parents, taking into account their coping capacity. For participants ages 10–14 years, results were disclosed to their parent/guardian, bearing in mind the child's age and maturity and the complexity of family dynamics.[29] The clinical team provided support to parents/guardians on how to tell their child that s/he was HIV positive. With a parent's permission, the trained HCT counselor from the team could disclose the HIV result to a child while ensuring the involvement of the parent/guardian in the disclosure process.[28]

Referrals and linkages

Reactive participants were referred to health facilities for follow-up and proper care and treatment. All participants were given the same referral form in order to protect their right to privacy and to avoid stigmatization, and the HIV test results were not written on the referral form. Parents/guardians of children ages 19 months to 14 years who were HIV positive were advised to seek care and treatment for the children as soon as possible. The counselors also encouraged participants to disclose to their families. For adolescents ages 15–17 years, counselor-supported disclosure was used if the participant

was ready to disclose their status to their parents during the counseling session.[29] Nonreactive participants were counseled on how to protect themselves from HIV and were given the generic referral list of resources and facilities for future testing. Nonreactive participants assessed as being at risk for HIV during pre-test counseling were referred to a health facility for retesting within the next three months. All survey participants were given the same referral form in order to keep their results confidential.

Rapid test quality control and proficiency testing

Quality assurance (QA) measures that included external quality assessment (EQA) of specimen collection and testing were implemented in accordance with the UNAIDS/WHO working group on guidelines for measuring HIV impact.[31] Strict adherence to QA measures and direct supervision consisted of observation of specimen collection and sample handling, use of SOPs, testing of proficiency testing panels, and use of a specimen tracking sheet and accurate documentation. Prior to commencing the survey, proficiency of testing personnel was assessed through testing of blinded positive and negative dry tube specimen (DTS) panels. Every first day of the week during the survey period testing personnel carried out QC testing on known positive and negative DTS specimen panels before commencing survey participants' testing.

Sample processing and testing in the satellite laboratories

CD4 testing was performed at a designated satellite laboratory within six hours of sample collection (see Figure 2-4 showing location of laboratories within the LGA). All selected satellite laboratories were equipped with a single-platform technology, BD FACS Count with the capacity to run both absolute and the percentage lymphocyte subset values. CD4 testing was conducted at the satellite laboratories according to the SOPs. After CD4 processing, 1 ml of the venous blood sample was used to prepare the DBS for the HIV incidence assay, which involved allowing the DBS sample to air-dry on drying racks at room temperature overnight in a secure location. During the drying process, samples were wire-mesh-protected to avoid tampering by rodents/flies. The DBS cards were then separated by glycine paper and stored at ambient temperature or in a freezer at -20°C in sealable zip lock plastic bags containing desiccants and a humidity indicator card for up to 14 days. The DBS samples collected from HIV-exposed infants in the household were also treated in the same way at the satellite laboratories. The DBS cards were then sent to the central PCR laboratory (at UUTH) for storage at -70°C. DBS has been used as a sample source for HIV incidence in India, South Africa, and France.[32 33 34]

Once DBS cards were spotted for the incidence testing, the remaining venous blood sample was centrifuged immediately to separate plasma from the red cells and then stored frozen at -20°C until transported to the central quality control laboratory for further assay under cold-chain conditions, in order to protect the integrity of the plasma sample for molecular testing.

S/N	Name of Laboratories	LGAs	Lab Category
1.	General Hospital Oron	Oron	Satellite Lab
2.	General Hospital Etinan	Etinan	Satellite Lab
3.	Mercy Hospital Abak	Abak	Satellite Lab
4.	Handmaids Hospital Ibiono	Ibiono -Ibom	Satellite Lab
5.	General Hospital Etim Ekpo	Etim Ekpo	Satellite Lab
6.	Cottage Hospital Ukana	Essien -Udim	Satellite Lab
7.	Methodist Hospital Ituk Mbang	Uruan	Satellite Lab
8.	General Hospital Ikono	Ikono	Satellite Lab
9.	Poly Clinic Eket	Eket	Satellite Lab
10.	Primary Health Centre Nsit Atai	Nsit Atai	Satellite Lab
11.	UniUyo Medical Centre Uyo	Uyo	Satellite Lab
12.	University of Uyo Teaching Hospital	Uyo	Central Quality Lab

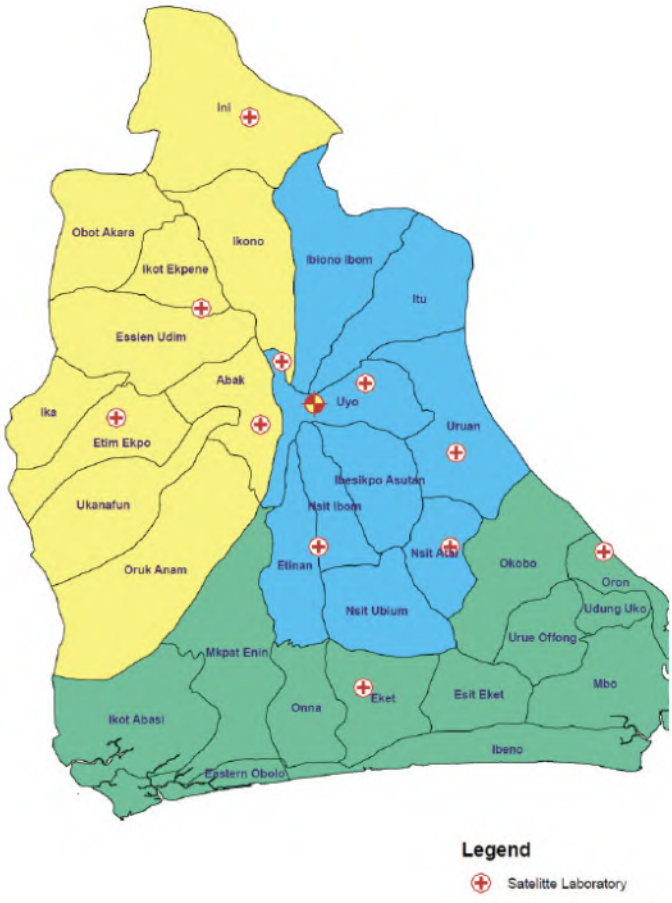


Figure 2-4. Map showing the 11 satellite laboratories and the central quality labs across the three central operational bases in each senatorial district

HIV re-testing

Whole blood samples (5 ml) collected from 10 percent of all respondents who tested HIV negative in the household and those who were reactive to the Determine kit were retested at the selected satellite laboratories following the same national serial testing algorithm used in the household (1) to compare the results of rapid testing performed in the household, and (2) to assess the proficiency of the laboratory personnel engaged for the household testing exercise(see Appendix B). This QC check was conducted concurrently with field implementation on a daily basis to ensure prompt corrective action as soon as any problems were identified. Where there were discordant results between rapid tests performed in the household and rapid tests performed at the satellite laboratories, the affected specimens were retested using Bio-Rad Geenius HIV-1/2 to confirm the results.

Central laboratory methods and testing

UUTH, the only teaching hospital in Akwa Ibom State, was designated as the central quality control laboratory to carry out EID, viral load, and HIV confirmatory testing of all positive samples and discordant samples collected in the field. UUTH ART and PCR laboratory was under the PEPFAR Strengthening Laboratory Management Toward Accreditation (SLMTA) program undergoing the WHO-AFRO recognition process. The laboratory had participated in the National Health Laboratory Service, South Africa; Oneworld Accuracy system, Canada; and CDC International Laboratory Branch, US external quality assessment for HIV serology, CD4, EID, and viral load testing and had been regularly successful in proficiency testing programs.

HIV confirmatory test

A two-test serial algorithm was used followed by confirmatory testing of specimens by Bio-Rad Geenius HIV-1/2 confirmatory assay. This algorithm is similar to the national three-test serial HIV rapid testing algorithm used in the field except that instead of the Stat-Pak HIV rapid test, the Geenius test kit served as the tie-breaker (Appendix C). The Geenius HIV-1/2 is a more specific test, used as a Gold Standard to confirm all positive rapid test results performed in the field. During the QC, all specimens that tested positive on both screening and confirmatory tests were reported positive as the final result. All specimens that tested negative on the second screening test (Unigold) and negative on the confirmatory test (Geenius) were reported negative as the final result. The final result of all specimens that tested negative on the second screening test (Unigold) and positive on the confirmatory test (Geenius) were reported as positive. All specimens that tested positive on both screening tests (Determine and Unigold) but tested negative on the confirmatory test (Geenius) were considered indeterminate and further confirmed with PCR testing.[35] Geenius results were considered indeterminate when not both HIV-1 spots (recombinant HIV-1gp41 Spot and HIV-1 gp41 Peptide) showed color development.[36]

Geenius HIV-1/2 confirmatory testing

The Geenius is a single-use test for the confirmation and differentiation of HIV-1 and HIV-2 Ab in several sample types, including whole blood, serum, or plasma. In this test, recombinant or synthetic peptides specific for HIV-1 (gp160, gp41, p31, p24) or HIV-2 (gp140, gp36) are applied as discrete lines

within a plastic cassette. The cassette employs Dual Path Platform (DPP)™ technology (Chembio) in which Ab binds the appropriate Ag before detection reagents are added to visualize the test result.[37] The possible results include HIV-1 reactive, HIV-2 reactive, HIV-1 and 2 reactive, nonreactive, or indeterminate. Results that are indeterminate require fourth-tier testing with an HIV-1 ribonucleic acid (RNA) viral load assay using the COBAS Ampliprep/TaqMan technique.[38]

The choice of using the Geenius HIV kit (immunoassay) over the Western blot (immunoblotting) is based on recommendations from the Clinical Laboratory Standards Institute (M53-A),[39] CDC's recommendations for HIV Serology Testing in surveillance[35] and substantiated by good performance data of the current national testing algorithm.[28]

Discordant HIV results

AKAIS participants were offered the opportunity to know their HIV status through return of rapid HIV test results. Where there was discordance between the field-/home-based testing and satellite site test results, the final test result was determined by the application of the Geenius assay to resolve the discordance. The standard of practice for HCT is to not return discordant results when quality assurance is performed by the national laboratory on HCT based on the national HCT program.

Discordant results between rapid test kits used in the field and rapid test kits used at the satellite site may indicate false-positive or false-negative results. All participants over the age of 18 months were informed that test results from the central quality laboratory would not be returned to them. Results found to be discordant at the central quality laboratory were not returned to individuals because of the following reasons:

- HIV-positive participants were encouraged to seek treatment in a facility in the study area where they were retested for HIV prior to initiating HIV treatment.
- HIV-negative adult participants and at-risk youth were encouraged to go for retesting three months after their rapid test.
- The AKAIS questionnaire included sensitive questions about same-sex relationships, which are highly stigmatized and illegal. The questionnaire and lab results were de-identified in order to preserve patient confidentiality.

Early infant testing

All infants below the age of 18 months were tested with Determine HIV rapid testing only. Irrespective of serological results, DBS were collected for all HIV-exposed children for deoxyribonucleic acid (DNA)-PCR testing by spotting drops of blood collected from the heel or big toe of the child onto Whatman filter paper according to the DBS collection SOP.
The DBS was eluted according to standard protocol and tested using PCR testing technology called COBAS Ampliprep/TaqMan Analyzer (a nationally approved qualitative in vitro test for HIV diagnosis in infants less than 18 months in Nigeria).

Plasma HIV-1 ribonucleic acid (RNA) viral load testing

HIV-1 RNA viral load testing was conducted on all specimens that tested positive at the UUTH central quality control laboratory. The blood samples for viral load were separated within six hours to obtain plasma at the satellite laboratories. Viral load testing was performed following the manufacturer's instructions using the COBAS Ampliprep/TaqMan Analyzer version 2.0.[40] The results of viral load were expressed as HIV-RNA copies/ml.

HIV incidence testing using Limiting Antigen (LAg)-Avidity EIA

A recent infection testing algorithm (RITA) was selected for estimating HIV incidence in Nigeria. All specimens reported as HIV positive by Geenius were tested for recent infection. The RITA involves the use of the LAg-Avidity assay combined with additional laboratory (e.g., viral load, ARV detection) data that can be used to classify HIV infections as recent or long term. To minimize potential misclassification on the assay, the viral load cut off of <1000 copies/ml was applied to minimize potential misclassification of the LAg assay. The Sedia Bioscience LAg assay kit (Sedia Biosciences Corporation Portland, Oregon, USA) was used to determine HIV incidence in Nigeria because of its beneficial potential to assay using both plasma and DBS specimens. Recent infection algorithm is presented in Figure 2-5 below.

Plasma samples and optimized DBS eluates from samples of participants over 15 years of age were tested with the LAg-Avidity enzyme immunoassay (EIA) using the assay as previously described.[41] Samples tested on the Sedia LAg assay were also tested using the Bio-Rad Avidity assay for multi-assay algorithm purposes. Misclassification was recently reported for the LAg-Avidity assay for advanced AIDS progression, elite controllers, and those on ART with viral suppression and partial seroreversion following ART, viral subtypes. Cross-sectional surveys based on a single serologic assay often overestimate HIV incidence, whereas a multi-assay algorithm (MAA) is said to provide more accurate discrimination between recent and nonrecent infection at the population level.[42 43]

Bio-Rad Avidity assay is an EIA Genetic Systems HIV-1/HIV-2 plus O. It uses recombinant proteins and synthetic peptides for the detection of antibodies to HIV-1 (Groups M and O) and/or HIV-2 (HIV-1/HIV-2).

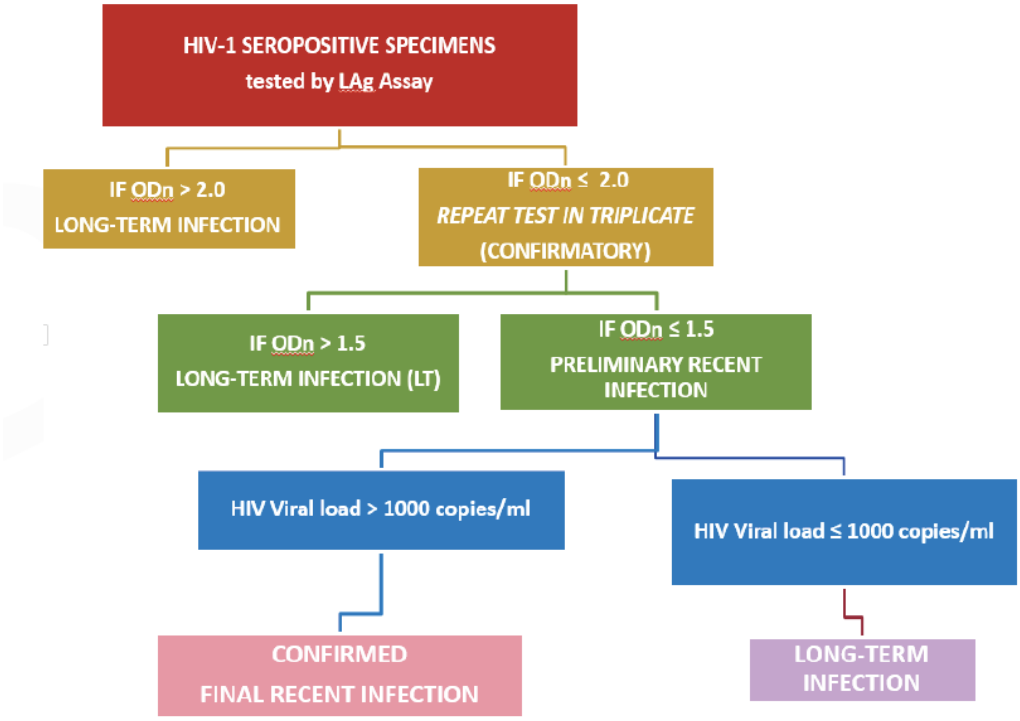


Figure 2-5. Testing algorithm for recent infection

2.1.19 HIV incidence calculation

HIV-incidence calculation was performed using the Sedia LAg data management sheet and HIV incidence calculator developed by CDC. HIV Incidence is defined as the number of new HIV infections occurring in a population, usually expressed as a rate of infection per person per unit of time.[44]

The CDC Incidence Calculator recommended by the WHO Incidence Working Group and the Consortium for Evaluation and Performance of Incidence Assays on Global HIV/AIDS and STI Surveillance for estimating population-level incidence in cross-sectional samples uses the following formula:

$$I_r = \frac{R - \varepsilon P}{(1-\varepsilon)\omega N}$$

Ir: Annual HIV incidence rate
N: Number of people testing HIV negative in the survey
P: Number of people testing HIV positive in the survey
R: Number of people classified as recent on the LAg-Avidity assay
ω: Mean duration of recent infection (MDRI: 130 days), specified in units of years: 0.356
ε: The false-recent rate for the test (FRR). An FRR of 0.0 percent was applied in the study as there was no FRR available for the country at the time. (The FRR is applied to the incidence testing algorithm, which corrected for ART exposure and potential elite controllers in the samples, the main sources of Lag-Avidity assay recent infection misclassification.)

In order to provide national estimates, the HIV-incidence calculation took into account the complex sampling design and used weighted numbers in the incidence formula. Confidence intervals were computed using a delta method approximation[44] and applying a design effect of 2.0.

2.1.20 Specimens repository

DBS samples and the separated plasma sample from the venous blood tube remaining after central testing were punched and stored at minus 70 C at the central laboratory of UUTH PCR for future reference under the Akwa Ibom State Government decisions relating to future use of repository specimens. A summary flow chart of central testing is described in Appendix C.

2.1.21 Data management and analysis

Any reference made to the AKAIS cluster in the study material, such as in the household listing forms and maps, used the EA unique identification number to protect the privacy of the households and individuals.

Data collected with tablets were transferred to the FHI 360 server at the end of each day using a 3G wireless mobile phone network or Wi-Fi-generated "hot spot" (accessible only by authorized users with authentication ID). Data were first reviewed by each survey team supervisor before being uploaded into the cloud. In order to accommodate varying strengths in mobile phone network areas, survey team members were given SIM cards of prevalent networks in the LGAs where they worked since there was variation in signal strength depending on the strength of the cellular networks. All SIM cards were registered with the service provider. Upon completion of the survey, all SIM cards were retrieved.

Laboratory data were also uploaded from the tablets through secure authentication access to the central server using a 3G wireless mobile phone network, Wi-Fi-generated "hot spot," or secure pre-existing Internet connection and merged with the household survey data using the unique barcode identification number found in both data sets. Supervisors, interviewers, and laboratory staff uploaded field data daily.

Data quality

At a primary level of ensuring data quality, the data were subjected to consistency checks (skip patterns, range values) as they were collected on the tablet. A further consistency check for validity and completeness was performed by cloud gatekeepers when data were downloaded and merged. All authorized users were given login credentials for the tablet and CSPro database. At all stages — storage, transmission, and offline storage — data were encrypted (that is, protected in such a way that any unauthorized access could not decipher the contents). Additional actions to ensure data quality were taken such as: (i) each data set had time stamps and dates for interviews conducted, user ID, hardware ID, transmission, and backup status; (ii) recording the international mobile equipment identity (IMEI) numbers of all tablets and linking this to team members; and (iii) daily data quality checks of data submitted to the central server, which was undertaken by cloud gatekeepers who had undergone the FHI 360 research ethics training prior to the survey.

Data security

A copy of the data transmitted by secure VPN was also sent to the FHI 360 secure server for backup. Full backups and differential backup techniques were performed.

Personal identifiers for children (ages 18 months or less) and adults were excluded in the household and individual survey questionnaires. Personal identifiers were collected for infants more than 18 months old to be used for relaying DNA-PCR test results to their parents or guardians. The infants' names, the unique EA identification number, and the unique household number were automatically encrypted at the point of data entry by the CSPro software. Data on the central servers and tablets were password protected and accessible only to restricted study personnel. These identification data were stored separately from the central laboratory testing data and research database.

Spare tablets were available for each survey team to be used in case of a tablet system malfunction, failure, or equipment loss. Electronic power bank devices were also provided as power backup for each tablet.

Data storage and archiving

During implementation and data collection, access to the central server was limited to the data managers and designated laboratory personnel in order to ensure data integrity.
Once the final data set was merged and cleaned, and the meeting on data analysis conducted, access and full data ownership were handed over to the State Government (State Ministry of Health [SMOH] and AKSACA) for data analysis. Anonymized data sets will be made available to the public health community after analysis and publication of the report. The final data set was stored and archived by Akwa Ibom SMOH and FHI 360.

Laboratory specimen data management system

Data for laboratory services both in the field and at the laboratories were collected using tablets. Upon receipt of specimens at the laboratory, the laboratory personnel scanned the barcode onto the tablets. The result of each test was also captured on the tablets using CSPro software.

Data analysis

In order to account for the clustered design of the AKAIS survey sample, weighted proportions were reported. Several weights were calculated — household weights, individual adult weights, and children and adolescent weights.
Domain analysis was performed for variables of interest. Analyses in the report were not adjusted for any confounding factors. Multivariate analysis data will be presented through other dissemination materials such as scientific publications.

Data were analyzed using Stata 12 software (StataCorp. 2011. Stata Statistical Software: Release 12. College Station, TX: StataCorp LP). Weighted proportions based on a denominator of less than 20 participants were not reported.

2.1.22 Response rates

Figure 2-6 illustrates a diagram of sampled clusters, households, and individual participation in AKAIS 2017. Household response rates were calculated as the number of households consenting to the household interview out of the total number of households that were eligible. Vacant, destroyed, or missing households were excluded from the study. Individual interview response rates were calculated as the number of people who completed the interview divided by the number of people who were eligible for the survey in the sampled households. Only those consenting to an interview could participate in the blood draw component of AKAIS 2017. However, one could give an interview and decline to provide a blood specimen.

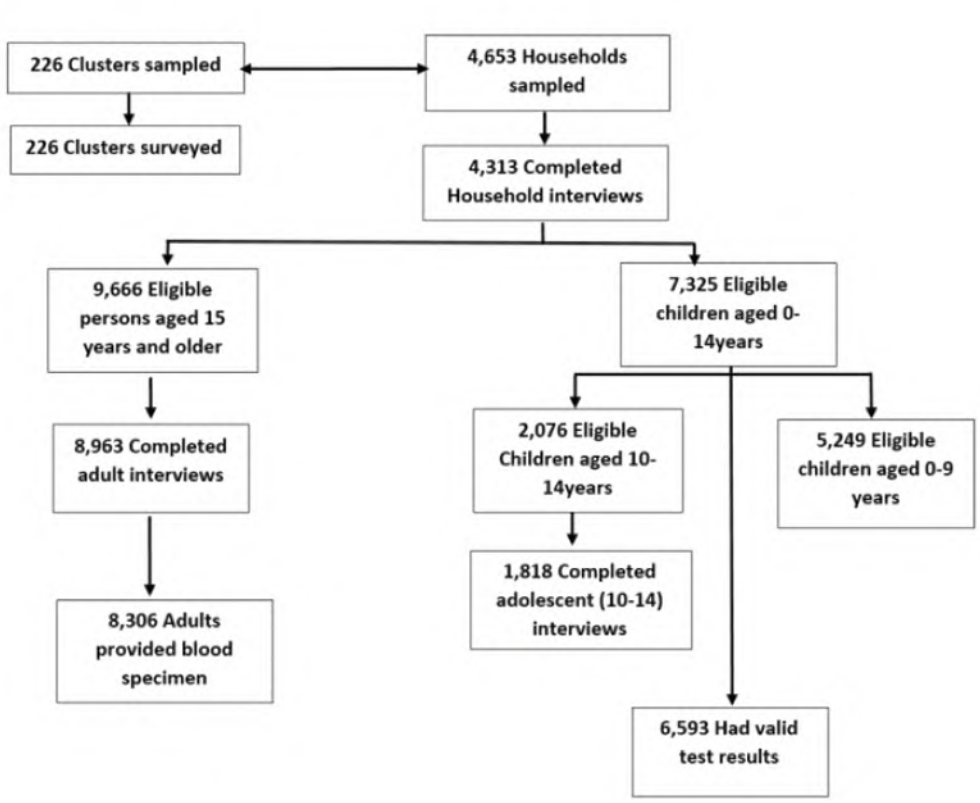


Figure 2-6. Diagram of sampled clusters, households, and individual participation in AKAIS 2017

A total of 3,390 households were sampled. However, at the end of the first phase of data collection, the individual sample size achieved for children and adults deemed eligible fell short of the minimum sample size requirement. Hence, a protocol modification was made to sample additional households until the minimum sample size was reached. An additional 1,263 households were sampled, making a total of 4,653 households sampled for AKAIS.

Of 9,666 eligible individuals ages 15 years and older, 8,963 (92.7 percent) completed individual interviews, and 8,306 (92.7 percent) provided a valid blood specimen. A total of 7,325 children ages 0 months–14 years were eligible for a blood draw. Of these, 6,593 (90.0 percent) provided a valid blood specimen.

2.1.23 Ethical approvals

The AKAIS protocol was approved by the FHI 360 Protection of Human Subjects Committee, North Carolina, USA, the Akwa Ibom State Ministry of Health Ethics Committee, the University of Uyo Teaching Hospital Review Committee, and the University of Nigeria Nsukka Teaching Hospital Health Research Ethics Review Committee.

Chapter 3:

Study Population Characteristics

CHAPTER THREE
STUDY POPULATION CHARACTERISTICS

3.1 Key findings

HOUSEHOLD COMPOSITION

68.4% of the household surveyed were from the rural areas

61.8% of these household were headed by men

Nearly half of the population surveyed are under the age of 15 with children 10 years and less were more in the households than other age categories.

HOUSING CONDITIONS

URBAN

67.8% have access to improved source of drinking water

89.8% had one form of electricity

66.7% owned mosquito nets

59.4% have access to improved source of drinking water

70.8% had one form of electricity

75.7% owned mosquito nets

RURAL

STUDY RESPONDENTS BY RESIDENCE

URBAN

31% of children ages 0-9 years are found in urban households

31.7% of adolescents 10-14 years are found in urban households

32% of respondent ages 15 years and older live in the urban areas

69% of children ages 0-9 years are found in rural households

68.3% of adolescents 10-14 years are found in rural households

68% of respondent ages 15 years and older live in the rural areas

RURAL

STUDY RESPONDENTS BY GENDER

49.9% of respondent ages 0-9 were males

53.2% of adolescents 10-14 years were males

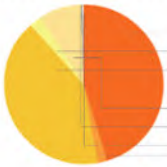
45% of respondent ages 15 years and older were males

50.1% of respondent ages 0-9 were females

46.8% of adolescents 10-14 years were females

55% of respondent ages 15 years and older were females

STUDY RESPONDENTS BY EDUCATIONAL STATUS OR SCHOOLING (10 - 14 YEARS)



- **45.4%** currently attending primary schools
- **1.9%** have completed primary school but not in junior secondary school
- **41.1%** attending junior secondary school
- **2.4%** have completed junior secondary school
- **8.7%** attending senior secondary school
- **0.1%** have completed senior secondary school
- **0.2%** were categorized as others.

About nine out ten reported they had ever attended school with most of them (**34.9%**) had secondary education as their highest level attained, (**0.2%**) had no education, (**8.6%**) had some primary education, (**23.8%**) had attained primary education, (**17.5%**) had some secondary education while (**15%**) had attained tertiary education.

3.1 Demographics and household composition

A total of 4,313 household questionnaires were analyzed, representing the number of households in the survey. The distribution of household demographics and composition by place of residence is presented in this section. Most (90.8 percent) of the respondents who completed the household questionnaires were the heads of household, 89 percent in urban areas and 91.7 percent in rural areas (Table 3-1).

A total of 16,994 people were surveyed from the selected households. An analysis of their gender composition by place of residence is shown in Table 3-1. There were more females (52.6 percent) than males (47.4) in the overall household make-up. There were more children ages 10 years and less in the households than other age categories, 32.6 percent in urban areas and 34.3 percent in rural areas (Figure 3-1).

Table 3-1. Demographic and household composition (unweighted), AKAIS 2017

Variable	Urban		Rural		Totals	
	n	%	n	%	n	%
Number of households surveyed	1,364	31.6	2,949	68.4	4,313	100
Respondent						
Head of household	1,214	89.0	2,703	91.7	3,917	90.8
Representative of head of household	150	11.0	246	8.3	396	9.2
Gender of household heads						
Male	909	67.0	1,849	61.8	2422	63.5
Female	455	33.0	1,100	38.2	1393	36.5
Average household size (mode)	4		4		4	
Total number of individuals surveyed (eligible)	5,157	30.3	11,837	69.7	16,994	100
Gender of household members						
Male	2,434	47.2	5,623	47.5	8,057	47.4
Female	2,723	52.8	6,214	52.5	8,937	52.6

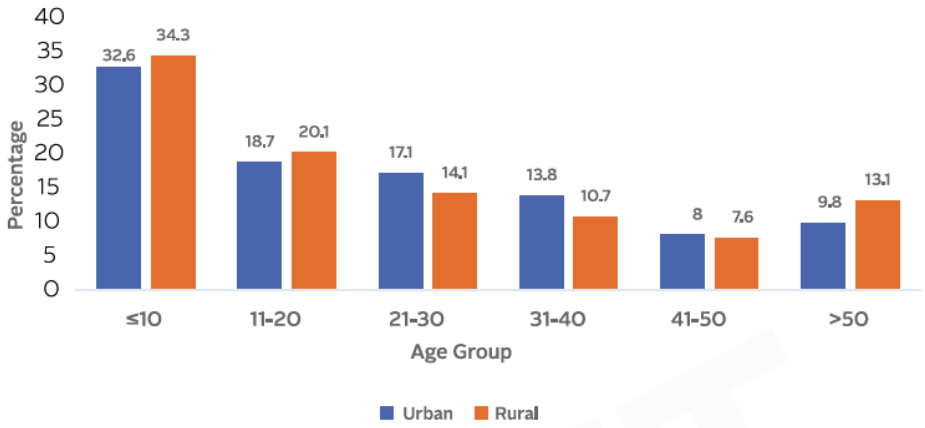


Figure 3-1. Household population by age category, AKAIS 2017

3.2. Respondents' characteristics

Respondents ages 0–9 years

The demographic characteristics of children ages 0–9 years are presented in Table 3-2. A total of 4,828 people in this age category were surveyed, 3,446 (69.0 percent) of whom resided in rural areas and 1,382 (31.0 percent) in urban areas. A total of 2,409 (49.9 percent) were male and 2,419 (50.1 percent) were female. Children ages 5–9 years numbered 2,371 (49.0 percent), while there were 2,457 (50.9 percent) ages 4 years and less.

Table 3-2. Demographic characteristics of respondents ages 0–9 years, AKAIS 2017

Variables	Urban (n = 1,382)	Rural (n = 3,446)	Total (n = 4,828)
	%	%	%
Children surveyed	31.0	69.0	100
Gender			
Male	47.9	50.5	49.9
Female	52.1	49.5	50.1
Age category (years)			
< 1	9.3	8.6	8.8
1 -4	43.2	41.6	42.1
5-9	47.5	49.7	49.0

Respondents ages 10–14 years

The demographic characteristics of adolescents ages 10–14 years is presented in Table 3-3. A total of 1,818 people in this age category were surveyed, 537 (31.7 percent) from urban areas and 1,281 (68.3 percent) from rural areas. Overall, 972 (53.2 percent) were male and 846 (46.8 percent) were female. Four hundred twenty-two (23.4 percent) of the children were age 10 years, 367 (20.3 percent) were age 11 years, 372 (20.2 percent) were 12 years of age, 335 (18.4 percent) were age 13 years, and 322 (17.7 percent) were 14 years of age. Children currently in school numbered 1,770 (97.4 percent), and the majority were in primary school (n=816 or 45.4 percent) and junior secondary school (n=721 or 41.1 percent). Of the 48 children who reported not currently being in school, 43 (89.6 percent) had ever attended school.

A disaggregation of these respondents' demographic characteristics by place of residence appears in Table 3-3.

Table 3-3. Demographic characteristics of respondents ages 10–14 years, AKAIS 2017

Variables	Urban (n = 537)	Rural (n = 1,281)	Total (n = 1,818)
	%	%	%
Adolescents surveyed	31.7	68.3	100
Gender			
Male	48.7	55.3	53.2
Female	51.3	44.7	46.8
Age category (years)			
10	25.6	22.3	23.4
11	20.3	20.3	20.3
12	19.8	20.4	20.2
13	19.1	18.0	18.4
14	15.2	18.9	17.7
Schooling			
Currently in school	97.1	97.6	97.4
Not currently in school	2.9	2.4	2.6
Current level of school among those currently in school (N=1,770)			
· Primary	40.1	47.8	45.4
· Completed primary, not in junior secondary	2.1	1.9	1.9
· Junior secondary	45.2	39.2	41.1
· Completed junior secondary	2.6	2.3	2.4
· Senior secondary	9.5	8.4	8.7
· Completed senior secondary	0.2	0.1	0.1
· Other	0.3	0.2	0.2
Ever attended school among those not currently in school (N=48)	100	83.9	89.6

Respondents ages 15 years and older

The demographic characteristics of people ages 15 years and older who were surveyed are presented in Table 3-4. A total of 8,963 people in this age category were surveyed, 2,755 (32 percent) of whom resided in urban areas and 6,208 (68 percent) in rural areas. Of those surveyed, 55 percent were female and 45 percent were male; people ages 15–19 years constituted 15.1 percent of people surveyed, while people ages 50 years and older constituted 24.2 percent of people surveyed. With respect to educational status, 90.5 percent reported that they had ever attended school, 34.9 percent of whom had secondary education as their highest level attained.

Regarding employment, 39.2 percent reported that they had done work for which they had received cash payment in the 12 months preceding the survey, and about two-thirds (66.2 percent) of these people also reported receiving cash payment for work done in the seven days preceding the survey. One hundred twenty-four (1.4 percent) of the people surveyed were students, while 96 (1.1 percent) were unemployed. Other job categories are presented in Table 3-4.

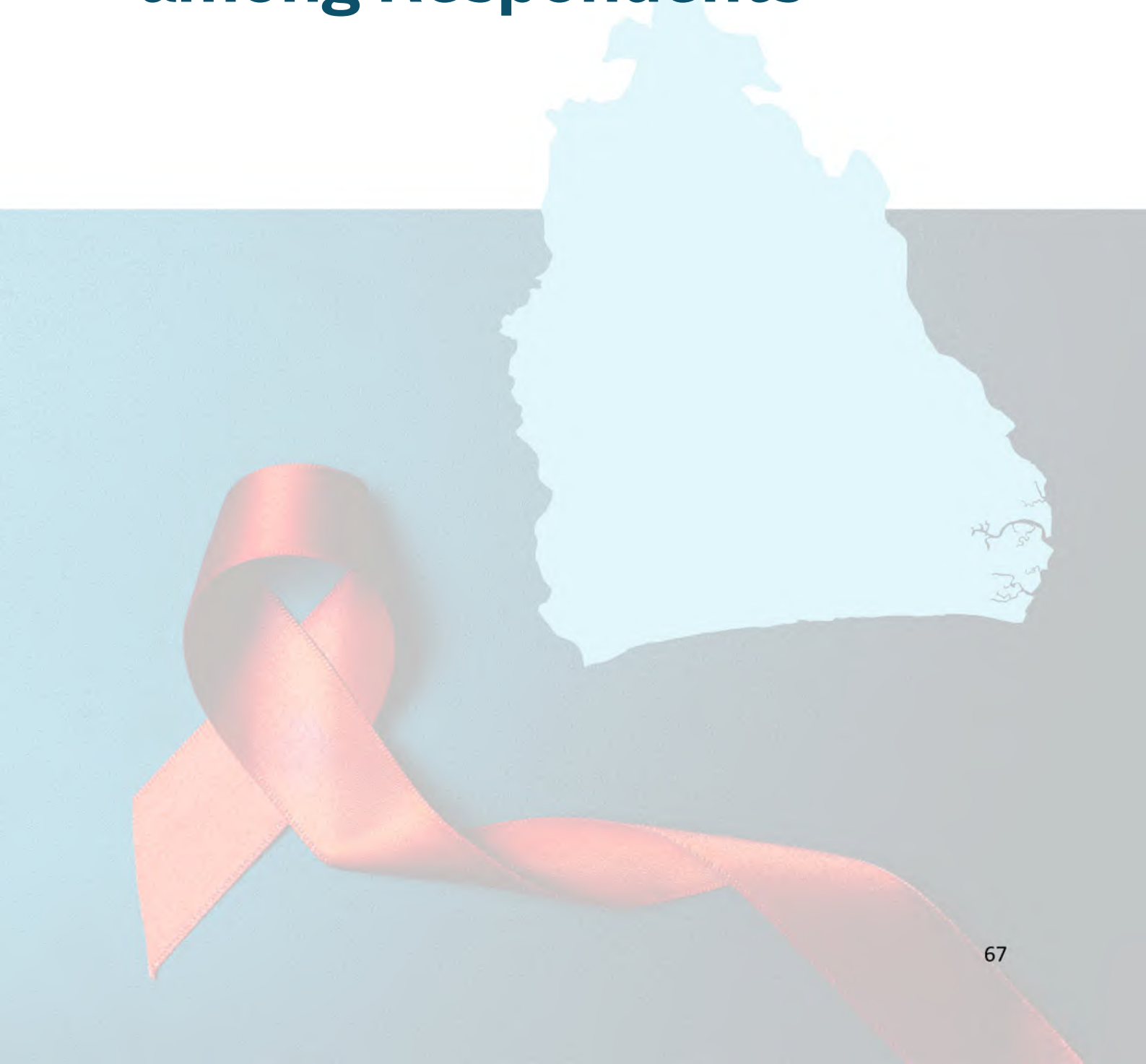
Table 3-4. Demographic characteristics of people ages 15 years and older who were surveyed, AKAIS 2017

Variables	Urban (n = 2,755)	Rural (n = 6,208)	Total (n = 8,963)
	%	%	%
People surveyed	32.0	68.0	100
Gender			
Male	46.1	44.5	45.0
Female	53.9	55.5	55.0
Age category (years)			
15-19	14.2	15.5	15.1
20-24	13.5	12.3	12.7
25-29	14.7	11.6	12.6
30-34	14.0	10.1	11.4
35-39	10.5	9.2	9.6
40-49	13.8	14.8	14.4
≥50	19.2	26.5	24.2
Education and Schooling			
Ever attended school (N=8,935)	94.5	88.6	90.5
Highest level of education attained (N=8,058)			
None	0.3	0.2	0.2
Some primary	5.7	10.0	8.6
Primary	18.5	26.5	23.8
Some secondary	14.7	18.9	17.5
Secondary	37.0	33.8	34.9
Tertiary	23.8	10.6	15.0
Missing (non-response)	0	0.03	0.02

Variables	Urban (n = 2,755)	Rural (n = 6,208)	Total (n = 8,963)
	%	%	%
Employment status			
Received cash for work done in the 12 months preceding survey	44.6	36.7	39.2
Received cash for work done in the 7 days preceding survey	65.9	66.3	66.2
Unemployed	1.4	0.9	1.1
Student	1.7	1.3	1.4
Job category			
Director/Senior management	0.1	0.05	0.1
Other management	0.1	0.4	0.3
Sales manager/ representative/insurance broker	0.9	0.2	0.4
Professional/specialist	3.2	1.7	2.2
Self-employed/own small business	15.6	13.9	14.4
Self-employed (informal sector, hawkers, vendors)	5.2	6.5	6.1
Blue collar skilled and semi-skilled	4.3	2.4	3.0
Unskilled	2.9	2.9	2.9
Clerk/clerical	1.0	0.5	0.7
Civil servant	6.6	2.1	3.5
Farmer/forestry/fishing/ mining	5.8	12.4	10.3

Chapter 4:

Knowledge of, Attitude towards, and Disclosure of HIV and AIDS status among Respondents



CHAPTER FOUR
KNOWLEDGE & ATTITUDE TOWARDS HIV/AIDS

4.1 Key findings

KNOWLEDGE OF HIV AND AIDS AMONG PEOPLE AGES 10 TO 14 YEARS

71.8%
of adolescents 10-14 years old had heard about HIV/AIDS

Sources of Information

- **79.7%** School/Teacher
- **22.9%** Radio
- **20.9%** Friends
- **20.6%** Parents & Guardian
- **17.5%** Television

PERCEIVED RISK OF HIV INFECTION AMONG ADOLESCENTS AGES 12-14 YEARS

Among
797
of adolescents **12-14years** who had heard about HIV,

74.9% did not perceive themselves as likely to get infected with HIV
4.2% said they were somewhat likely
2.5% said they were very likely to get HIV
18% did not know their likelihood of getting HIV

ATTITUDE TO HIV AND AIDS AMONG ADOLESCENTS AGES 10-14 YEARS

Amongst adolescents who reported they were aware of HIV/AIDS, **23.3%** were willing to play with a HIV-infected person, while only **16%** of them were willing to share food with a HIV-infected person.

KNOWLEDGE OF HIV AND AIDS AMONG PEOPLE AGES 15 YEARS AND OLDER

29.1%
of adults aged 15 years and older had UNAIDS comprehensive knowledge of HIV.

Knowledge was higher among males (**32.3%**) than females (**26.7%**) higher in urban (**36.7%**) than rural areas (**25.7%**), higher in those with any schooling (**31.1%**) than those with no schooling (**11.3%**), and increased with level of education *(no education* ***11.7%****, primary* ***20.6%****, secondary* ***31.2%*** *and tertiary* ***53.7%****).*

PERCEIVED RISK OF HIV INFECTION AMONG PEOPLE AGES 15 YEARS AND OLD

Among
8,933
people aged 15 years and older

58% did not perceive themselves at risk for HIV
26.6% perceived their risk of getting infected to be small
3.4% felt their risk was moderate
1.3% felt their likelihood of getting infected was high
9.9% said they did not know their risk of getting infected

ATTITUDE TO HIV AND AIDS AMONG PEOPLE AGES 15 YEARS AND OLDER

Among people aged 15 years and older, **49.3%** of respondents would buy vegetable from HIV-infected vendors, **53.3%** think HIV-infected and uninfected children should be allowed to attend the same schools, **71.5%** would be ashamed if a family member has HIV.

4.1 Knowledge, attitudes toward HIV and AIDS

Information was collected from adolescents ages 10–14 years on awareness of HIV and AIDS; knowledge of modes of transmission, prevention, and treatment of HIV and AIDS; perceptions of risk for HIV; and attitudes toward HIV-infected people. The findings are presented in Tables 4-1 and Figures 4-1.
Information was also collected from people ages 15 years and older on knowledge of risk factors, modes of transmission of HIV, and common misconceptions about HIV transmission; perceptions of risk for HIV; and attitudes toward HIV-infected people. The findings are presented in Tables 4-2 and Figures 4-2.

4.1.1. Knowledge of HIV and AIDS among people ages 15 years and older

This section is on the awareness and knowledge of HIV and AIDS among adolescents ages 10–14 years. The majority (71.8 percent) of the adolescents had heard about HIV and AIDS. Of this, 766 (59.5 percent) knew that a healthy-looking person could have HIV, and 805 (62.7 percent) were aware that there are drugs for treatment of HIV. The most common source of information was school, as reported by 1,025 (79.7 percent) of these adolescents. Other sources of information included radio (22.9 percent), friends (20.9 percent), parents and guardian (20.6 percent), and television (17.5 percent). The modes of transmission of HIV that were identified by adolescents included sharing sharp objects (72.6 percent), having sex with an infected person (45.7 percent), contact with infected blood (32.9 percent), blood transfusion (20.4 percent), and mother-to-child transmission (8.5 percent).

With respect to HIV prevention, the methods identified by adolescents ages 10–14 years included not sharing sharp objects (65.3 percent), abstaining from sex (42.2 percent), having no contact with blood (29.7 percent), and using condoms during sex (17.6 percent) (Table 4-1).

Table 4-1. Awareness and knowledge of HIV among adolescents ages 10–14 years, AKAIS 2017

Variables	%
Ever heard of HIV and AIDS (n=1,286)	71.8
Knowledge of HIV (n=1,286)	59.5
A healthy-looking person can have HIV	
Aware of antiretroviral drugs for HIV	62.7
Source of information on HIV (n=1,286)	
School/teachers	79.7
Radio	22.9
Friends	20.9
Parents/guardian	20.6
Television	17.5
Other family members	10.3
Religious leaders	7.0
Hospital/clinic	3.6
Community health workers	3.1
Internet	1.0
Mobile phone	0.5
Other	1.4
Modes of transmission (n=1,286)	
Sharing sharp objects	72.6
Having sex with an infected person	45.7
Contact with infected blood	32.9
Blood transfusion	20.4
Mother-to-child	8.5
Prevention of HIV (n=1,286)	
Not sharing sharp objects	65.3
Abstaining from sex	42.2
No contact with infected blood	29.7
Using condom during sex	17.6

Of the 1,818 adolescents ages 10–14 years who were surveyed, 816 (46.1 percent) reported that they had ever heard of condoms. Among these 816 adolescents who had heard of condoms, (50.6 percent) knew it could be used for HIV prevention. The proportion of adolescents who knew that condoms could also be used to prevent other STIs (24.3 percent) and pregnancy (49.4 percent) are presented alongside HIV prevention in Figure 4-1.

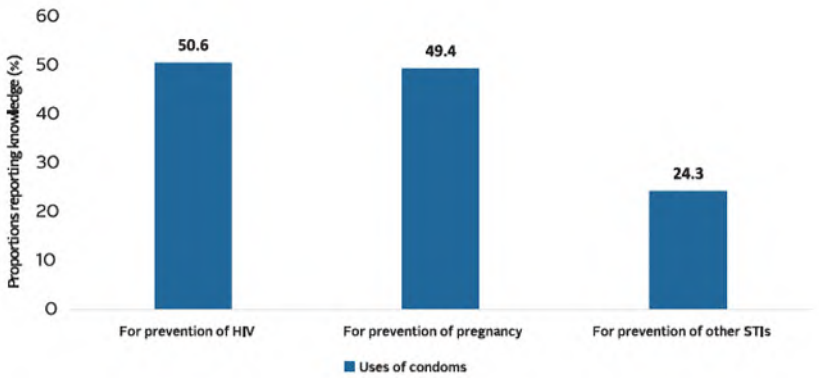


Figure 4-1. Knowledge of uses of condoms among adolescents ages 10–14 years, AKAIS 2017

4.1.2. Knowledge of HIV and AIDS among people ages 15 years and older

The majority of adults ages 15 years and older (7,248 or 81.1 percent) knew that a healthy-looking person could have HIV. The proportion that knew that HIV risk-reduction strategies include having sex with an uninfected partner and consistent use of condoms during sex were 81.7 percent and 74.0 percent, respectively.

Concerning misconceptions about HIV transmission, 34.4 percent said HIV could be transmitted by mosquito bites, 23.4 percent said it could be contacted by sharing food with an infected person, while 39.4 percent said people could get HIV through witchcraft and other supernatural means (Figure 4-2).

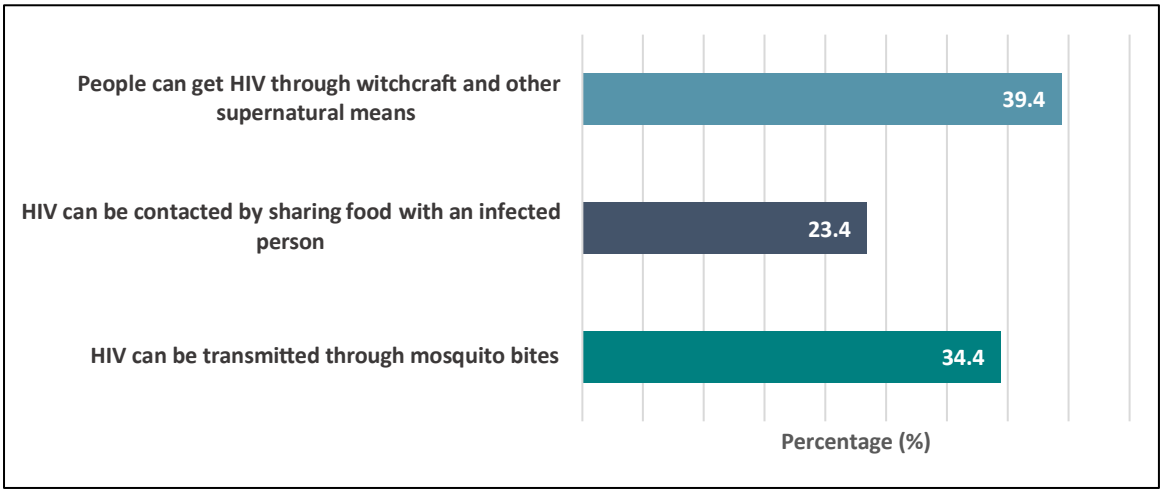


Figure 4-2. Misconceptions about HIV transmission among people ages 15 years and older, AKAIS 2017

As defined by UNAIDS, comprehensive knowledge of HIV transmission was computed using five knowledge variables that included correct knowledge that a healthy-looking person could have HIV, the risk of HIV could be reduced by having sex with an uninfected faithful partner and consistent condom use during sex, and correctly identifying two misconceptions about HIV transmission (namely transmission through mosquito bites and sharing food with an

infected person). Overall, only 29.1 percent of adults ages 15 years and older reported the five knowledge indicators correctly.

Disaggregation of knowledge of HIV risk-reduction strategies, perceptions of self-risk, and attitudes toward HIV-infected people for respondents ages 15 years and older by selected demographic characteristics are presented in Table 4-2.

Knowledge of HIV risk-reduction strategies (sex with one uninfected partner and consistent condom use during sex) was higher in urban than rural areas and among people who had any schooling compared to those who had none. Knowledge was seen to increase with level of education. It was also higher among males than females.

Comprehensive knowledge of HIV transmission was higher among males (32.3 percent), than among females (26.7 percent). It was also higher in urban areas (36.7 percent) than rural areas (25.7 percent). Comprehensive knowledge of HIV transmission increased with level of education from 11.7 percent among those who had no education to 53.7 percent among those with a tertiary education. Among age categories, comprehensive knowledge increased from 26.9 percent among people in the age category 15–19 years to 37.9 percent among people 30–34 years, after which it declined gradually to 22.1 percent in people ages 50 years and older (Table 4-2).

Table 4-2. Disaggregation by demographic characteristics of knowledge of HIV among people ages 15 years and older, AKAIS 2017

Variables	n	Sex with one uninfected partner reduces risk of HIV infection (%)	Consistent condom use during sex reduces risk of HIV infection (%)	A healthy-looking person can have HIV infection (%)	Mosquito cannot transmit HIV (%)	Sharing meal with an infected person cannot spread HIV (%)	Comprehensive knowledge (percentage who got all 5 right) (%)
Place of residence							
Urban	2,745	85.6	78.3	85.7	60.2	72.4	36.7
Rural	6,188	79.9	72.2	79.2	47.6	63.6	25.7
Gender							
Male	4,021	85.5	80.1	83.6	54.7	67.8	32.3
Female	4,912	78.6	69.3	79.4	49.2	65.3	26.7
Age category							
15 -19	1,359	77.3	75.9	74.9	52.7	69.9	26.9
20 – 24	1,133	84.8	83.6	85.9	50.0	72.1	29.3
25 – 29	1,120	85.9	83.8	87.4	55.0	72.0	36.0
30 – 34	1,004	87.1	82.7	88.1	60.0	71.8	37.9
35 – 39	858	88.1	80.3	85.2	52.5	68.1	32.5
40 – 49	1,282	85.0	71.8	85.1	53.3	64.6	28.8
≥ 50	2,177	73.6	58.0	72.8	45.0	56.3	22.1

Variables	n	Sex with one uninfected partner reduces risk of HIV infection (%)	Consistent condom use during sex reduces risk of HIV infection (%)	A healthy-looking person can have HIV infection (%)	Mosquito cannot transmit HIV (%)	Sharing meal with an infected person cannot spread HIV (%)	Comprehensive knowledge (percentage who got all 5 right) (%)

Schooling							
Any schooling	8,059	83.8	77.1	83.6	53.7	68.8	31.1
No schooling	874	61.7	46.3	59.7	32.0	43.6	11.3
Level of education							
None	895	62.4	46.3	60.0	32.6	44.0	11.7
Primary	2,637	79.4	66.8	78.6	42.3	58.4	20.6
Secondary	4,222	84.3	81.4	83.6	53.5	71.0	31.2
Tertiary	1,176	91.6	84.8	94.5	79.2	84.1	53.7
TOTAL	**8,933**	**81.7**	**74.1**	**81.1**	**51.7**	**66.4**	**29.2**

4.1.3. Attitudes toward HIV and AIDS among adolescents ages 10–14 years

Figure 4-3 presents attitudes of adolescents ages 10–14 years toward HIV-infected people. Among the 1,286 adolescents who reported that they were aware of HIV and AIDS, 23.3 percent were willing to play with an HIV-infected person, while only 16 percent were willing to share food with an HIV-infected person.

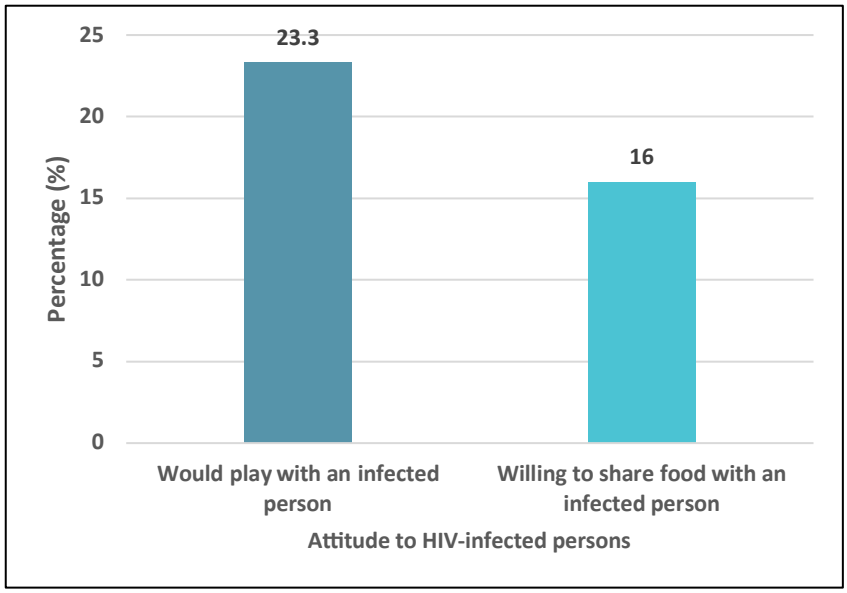


Figure 4-3. Attitudes towards HIV-infected persons among adolescents ages 10–14 years, AKAIS 2017

4.1.4. Attitudes toward HIV and AIDS among people ages 15 years and older

This section shows the results of attitudes toward HIV among people ages 15 years and older. A total of 8,933 adults ages 15 years and older responded to questions about attitudes toward HIV-infected people, social stigma, and discrimination of HIV-infected persons. Concerning attitudes to HIV-infected persons, 49.3 percent of respondents said they would buy vegetables from HIV-infected vendors, 53.3 percent thought HIV-infected and -uninfected children should be allowed to attend the same schools, 71.5 percent would be ashamed if a family member had HIV, and 81.3 percent believed people hesitate to test for HIV for fear of social stigma if found positive. Results on social stigma and discrimination of HIV-infected people show that 84.7 percent of respondents believed people talk

negatively about those living with or suspected to have HIV, while 78.4 percent were of the opinion that HIV-infected people lose the respect of their family members and community (Table 4-3).

Table 4-3. Attitudes toward HIV-infected people among adults ages 15 years and older, AKAIS 2017

Variables	Percentage
Would buy fresh vegetables from HIV-infected vendor	49.3
HIV-infected and uninfected children should be allowed to attend school together	53.3
Would be ashamed if family member had HIV	71.5
People are reluctant to test because of fear of social stigma if HIV positive	81.3
People talk negatively about people living with HIV or suspected to have HIV	84.7
Loss of respect for people living with HIV or suspected to have HIV	78.4

4.1.5. Perceived risk of HIV infection among adolescents ages 12–14 years

HIV risk perceptions among adolescents ages 12–14 years who reported that they had heard of HIV is presented in Figure 4-4, along with risk perceptions among those who reported that they had ever had sex. Among 797 adolescents in this age category who had heard about HIV, 74.9 percent did not perceive themselves as likely to get infected with HIV, 4.2 percent said they were somewhat likely, 2.5 percent said they were very likely to get HIV, and 18 percent did not know their likelihood of getting HIV.

Among the 85 adolescents ages 12 to 14 years who had ever had sex, 73 reported on their likelihood of getting HIV, while 12 did not respond. Of those who responded, 64.1 percent said they were unlikely to get HIV, 22 percent said they did not know their likelihood of getting HIV, 12.7 percent said they were somewhat likely, and only one person (1.2 percent) said s/he was very likely to get HIV.

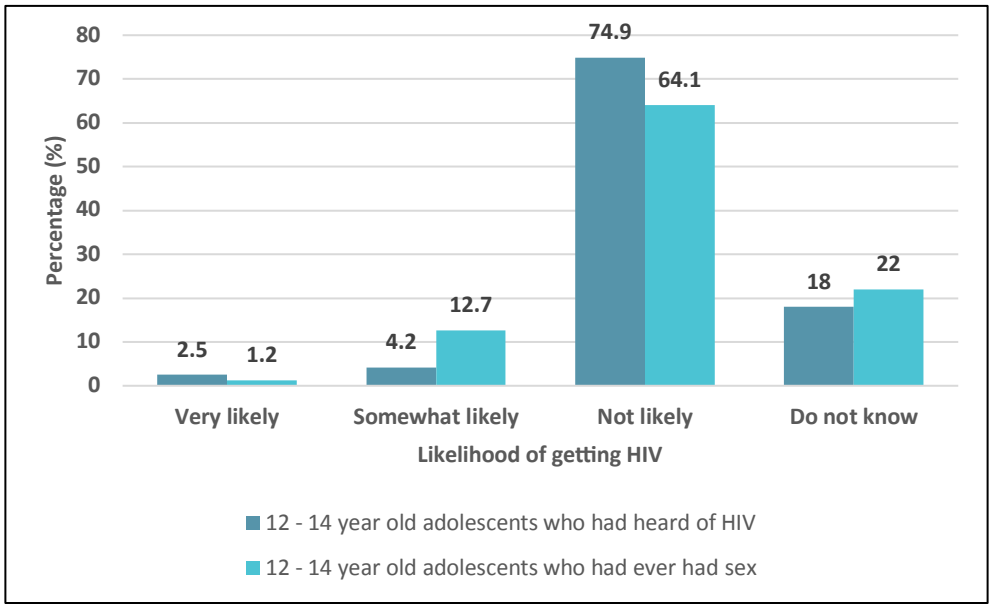


Figure 4-4. Perceived likelihood of getting HIV among adolescents ages 12-14 years, AKAIS 2017

4.1.6. Perceived risk of HIV infection among people ages 15 years and older

Among people ages 15 years and older, 58 percent did not perceive themselves as being at risk for HIV, while 26.6 percent perceived their risk of getting infected to be small, 3.4 percent felt their risk was moderate, 1.3 percent felt that their likelihood of getting infected was high, and 9.9 percent said they did not know their risk of getting infected (Figure 4-5).

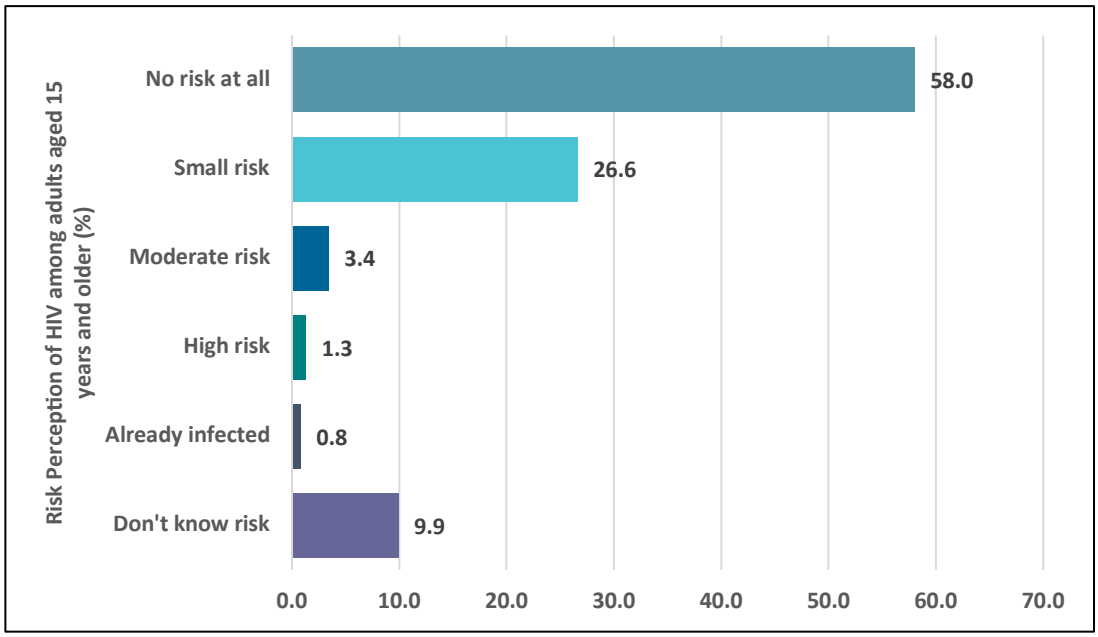


Figure 4-5. Risk Perception of HIV among adults ages 15 years and older, AKAIS 2017

4.1.7. Knowledge of and attitudes toward HIV, disaggregated by place of residence

A disaggregation of HIV awareness by demographic characteristics among adolescents ages 10–14 years is presented in Table 4-4. Among the 10- to 14-year-olds surveyed, 70.6 percent of males and 73.1 percent of females had ever heard of HIV and AIDS. Awareness was higher among ages 10–14 years in urban areas (79.7 percent) than rural areas (68.1 percent). The proportions of those ages 10–14 years who were aware of HIV and AIDS increased with older age category and level of schooling. Those who had any schooling were more aware of HIV and AIDS (72.1 percent) than those who did not (59.1 percent).

Table 4-4. Disaggregation of HIV and AIDS awareness by demographic characteristics among adolescents ages 10–14 years, AKAIS 2017

Variables	n	%
Ever heard of HIV	1,818	71.8
Place of residence		
Urban	537	79.7
Rural	1,281	68.1
Gender		
Male	972	70.6
Female	846	73.1
Age (years)		
10	422	59.7
11	367	66.7
12	372	73.9
13	335	79
14	322	83.6
Schooling		
Currently in school	1,770	72.1
Not currently in school	48	59.1
Level of school		
None	53	61
Primary	850	57.4
Junior secondary	761	84.4
Senior secondary	154	90.1

With respect to attitudes toward HIV-infected persons; the proportion of people who reported that they would be ashamed of an HIV-infected family member were higher among people ages 15–19 years, in rural areas than urban areas, among females than males, and among those who had no schooling compared to those who did. The proportions also decreased with schooling. On the other hand, more people in urban compared to rural areas, more males than females, people in the age category of 30–34 years, and those with schooling felt that HIV-infected and uninfected children should be allowed to attend the same school. The proportions increased with the level of schooling (Table 4-5).

Table 4-5. Attitudes toward PLHIV among people ages 15 years and older, disaggregated by selected demographics, AKAIS 2017

Variables	n	Would be ashamed if family member had HIV (%)	HIV-infected and uninfected children should be allowed to attend same school (%)
Place of residence			
Urban	2,745	62.5	61.7
Rural	6,188	75.7	49.3
Gender			
Male	4,021	68.9	57.0
Female	4,912	73.6	50.2

Variables	n	Would be ashamed if family member had HIV (%)	HIV-infected and uninfected children should be allowed to attend same school (%)

Age category			
15 -19	1,359	77.0	48.5
20 – 24	1,133	70.0	54.8
25 – 29	1,120	68.5	55.4
30 – 34	1,004	65.3	61.9
35 – 39	858	69.3	58.0
40 – 49	1,282	70.0	56.5
≥ 50	2,177	75.0	46.5
Schooling			
Any schooling	8,059	70.7	55.2
No schooling	874	78.5	34.7
Level of education			
None	895	78.4	35.4
Primary	2,637	79.2	45.9
Secondary	4,222	72.3	54.4
Tertiary	1,176	47.1	78.5
Missing	3	*	*
Total	**8,933**	**71.5**	**53.3**

**denominator less than 20 observations*

Significant differences existed across all demographic variables for HIV risk perception among adults and adolescents surveyed. A perception of no risk was highest in urban areas, among female respondents, in the age category of 30 years or more, and among those who had no schooling and education (Table 4-6).

Table 4-6. Disaggregation by demographic characteristics of individual/self-risk perceptions for HIV among people ages 15 years and older, AKAIS 2017

Variables	n	Not at all at risk (%)	Small risk (%)	Moderate risk (%)	High risk (%)
Place of residence					
Urban	2,745	61.3	27.2	2.6	1.1
Rural	6,188	56.5	26.3	3.7	1.4
Gender					
Male	4,021	53.3	30.2	4.0	1.6
Female	4,912	61.8	23.6	2.8	1.1
Age category					
15 -19	1,359	56.1	26.4	3.4	1.7
20 – 24	1,133	53.6	28.4	5.5	2.0
25 – 29	1,120	54.6	31.8	3.7	1.8
30 – 34	1,004	54.7	29.6	4.7	1.1
35 – 39	858	59.4	26.4	4.5	0.9
40 – 49	1,282	56.8	29.0	2.5	1.5
≥ 50	2,177	65.0	20.3	1.6	0.6
Schooling					
Any schooling	8,059	57.4	27.6	3.6	1.4
No schooling	874	64.1	17.5	1.5	0.8
Level of education					
None	895	64.3	17.7	1.4	0.8
Primary	2,637	57.9	25.7	2.6	1.2
Secondary	4,222	55.5	28.5	4.3	1.5
Tertiary	1,176	62.3	28.4	3.1	1.3
Missing	3	*	*	*	*
Total	**8,933**	**58.0**	**26.6**	**3.4**	**1.3**

*Denominator less than 20 observations

4.2. Knowledge and disclosure of HIV status among respondents

4.2.1. Self-reported HIV status among HIV-infected people (disaggregated by age, gender, place of residence, marital status, education)

Among the 8,933 people ages 15 years and older who responded to HIV testing questions, 4,175 (47 percent) reported that they had ever been tested for HIV. Of those who reported ever being tested for HIV, 91.8 percent said their last test result was negative, 2.1 percent reported a positive test result, 4.3 percent did not receive their test result, 0.7 percent of the people said their result was indeterminate, and 1.1 percent said they did not know the result of the test (Figure 4-6).

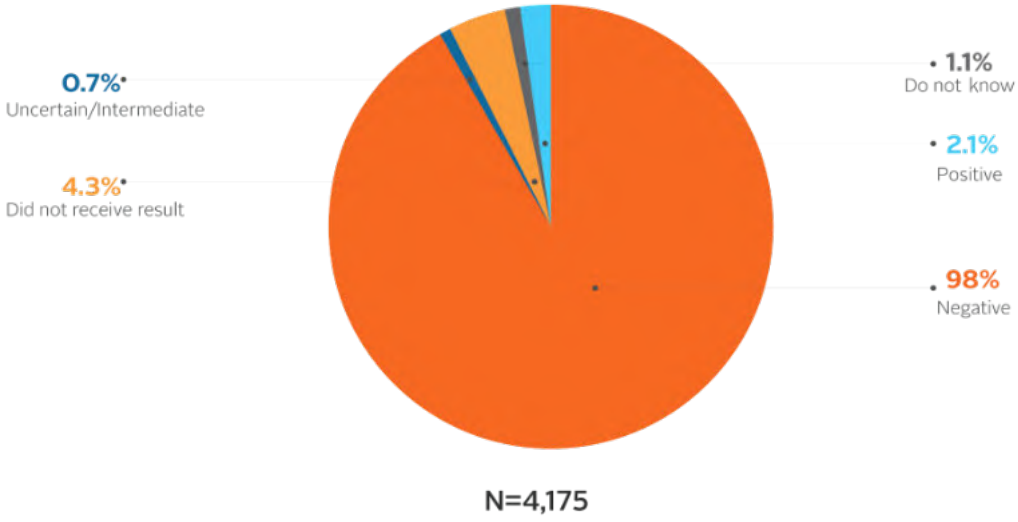


Figure 4-6. HIV test results among people ages 15 years and older, AKAIS 2017

A disaggregation of self-reported HIV-positive status among people ages 15 years and older by their demographic characteristics is presented in Table 4-7. Table 4-7 shows that more females (2.8 percent) than males (1.3 percent) reported that they were HIV positive. More people ages 15 years in urban areas (2.6 percent) than rural areas (1.8 percent) reported that they were HIV positive. Self-reported HIV-positive status increased with increasing age category, from 1.1 percent among the age category of 15–19 years to 3.0 percent among people 40–49 years. Self-reported HIV-positive status reduced with increasing level of education from 4.4 percent among those who had no education to 1.2 percent among those who had tertiary-level education.

Table 4-7. Self-reported HIV-positive results disaggregated by demographic characteristics among people ages 15 years and older, AKAIS 2017

Variables	n	%
Gender		
Male	1,811	1.3
Female	2,364	2.8
Place of residence		
Urban	1,566	2.6
Rural	2,609	1.8
Age category (year)		
15-19	369	1.1
20-24	585	1.4
25-29	688	1.7
30-34	649	2.2
35-39	485	2.7
40-49	657	3.0
50+	742	2.4
Level of education		
None	229	4.4
Primary	999	2.9
Secondary	1,987	1.9
Tertiary	959	1.2

4.2.2. Disclosure of HIV status

HIV disclosure status among self-reported HIV-positive people shows that 37.8 percent had not disclosed their positive status to anyone, 28.9 percent had disclosed to their spouse/partner and/or a family member, 17.8 percent had disclosed to doctor, and 3.3 percent said they had disclosed to a friend (Figure 4-7).

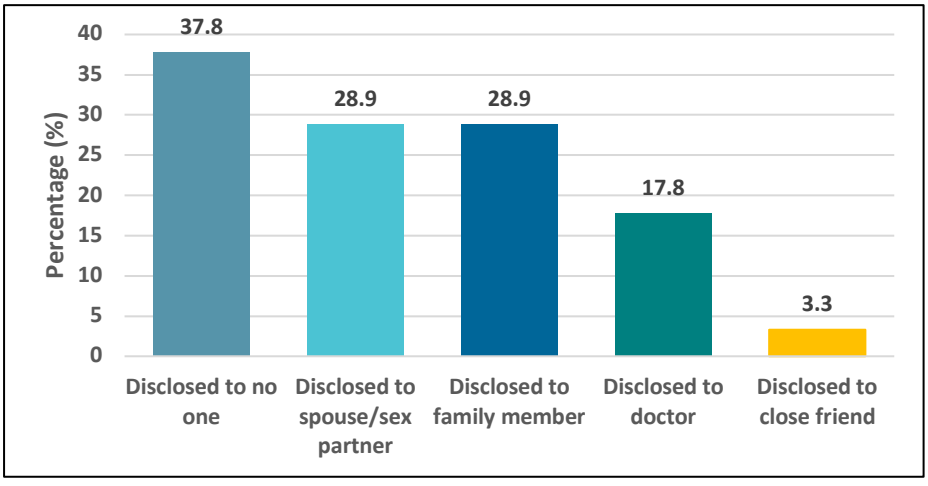


Figure 4-7. Disclosure patterns among respondents ages 15 years and older, AKAIS 2017

Chapter 5: Behavioral Risk

Chapter 5:

Behavioural Risk

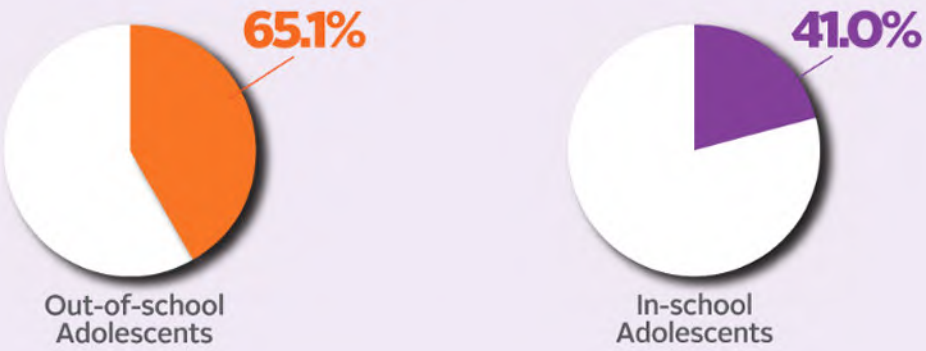
CHAPTER FIVE

BEHAVIORAL RISK

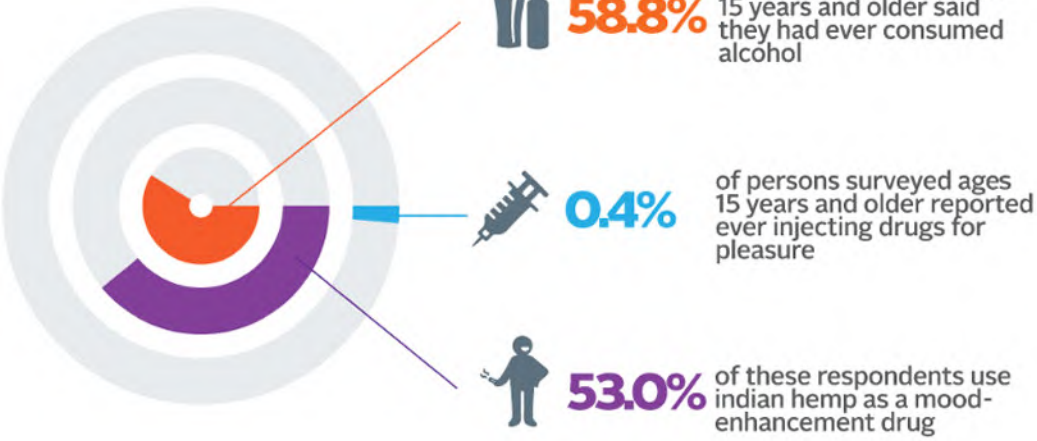
5.1 Key findings

SEXUAL BEHAVIOR

Adolescents aged 12 - 14 who reported ever having sex



USE OF ALCOHOL AND PERFORMANCE ENHANCING DRUGS



AKAIS 2017

5.1. Behavioral risk among adolescents ages 12–14 years

5.1.1. Sexual behavior among adolescents (ever had sex, sexual debut, number of lifetime sex partners, condom use at sex, transactional sex)

The sexual behavioral risk factors for HIV reported by adolescents ages 12–14 years are presented in this chapter. Of the 1,029 adolescents surveyed in this age category, responses for sexual awareness, exposure, and behavior were elicited only from the 934 adolescents who did not show signs of distress at the questions or indicated that they could continue regardless. All the 934 adolescents were unmarried. Only 392 (41.8 percent) had ever heard of sex.

Table 5-1 shows level of awareness of sex disaggregated by demographic characteristics among the 392 adolescents ages 12–14 years. Awareness of sex was higher in urban areas (n=123 or 46.3 percent) than rural areas (n=269 or 40 percent). More females (n=201 or 44.2 percent) were aware of sex than males (n=191 or 39.6 percent). Awareness of sex was highest among 14-year-olds (n=157 or 52 percent) compared to the 12- and 13-year-olds. Adolescents who were out of school had higher awareness of sex (n=21 or 65.1 percent) than those in school (n=369 or 41 percent). Among those in school, awareness of sex increased with level of schooling.

Table 5-1. Ever heard of sex among adolescents ages 12–14 years disaggregated by demographic characteristics, AKAIS 2017

Variables	N	Weighted proportion (%)
Ever heard of sex	934	41.8
Type of place of residence		
Urban	261	46.3
Rural	673	40.0
Gender		
Male	480	39.6
Female	454	44.2
Age		
12	334	34.2
13	301	40.2
14	299	52.0
Schooling		
Currently in school	902	41.0
Not currently in school	32	65.1
Level of education among those currently in school		
Primary	253	28.5
Junior secondary	512	43.0
Senior secondary	134	56.6

Among the 392 who had ever heard of sex, 86 (22.1 percent) reported that they had ever had sex. Vaginal sex was the most common practice (n=85 or 98.7 percent). None of the sexually active adolescents reported ever having anal sex. Condom use at first sex was very low among adolescents; 8 (9 percent) reported using condoms at first sex. Forty-eight of the adolescents (57.2 percent) had had their first sex with an older partner. Thirty-seven percent reported their sexual debut before the age of 12 years.

Eleven (12.2 percent) of the adolescents reported having ever had sex in exchange for money and material goods. The majority (n=72 or 84.7 percent) reported having one sexual partner in their lifetime.

Disaggregation of adolescents' sexual behavior by demographic characteristics is presented in Table 5-2. A greater proportion of adolescents ages 12–14 years in rural areas (n=65 or 24.3 percent) than urban areas (n=21 or 17.4 percent) reported that they had ever had sex. More females (n=46 or 23.4 percent) than males (n=40 or 20.6 percent) reported ever having sex. Exposure to sexual intercourse increased with age, at 21 (17.8 percent) among 12-year-olds, 23 (20.2 percent) among 13-year-olds, and 42 (26.6 percent) among 14-year-olds. A higher proportion of out-of-school adolescents ages 12–14 years, 41.9 percent, reported ever having sex compared to in-school adolescents at 21.0 percent. Among those who were currently in school, the proportion who had ever had sex increased with level of schooling.

A disaggregation by gender category of relative age of first sexual partner among adolescents ages 12–14 years shows that more females than males had an older first sexual partner, at 81.5 percent of females and 27.5 percent of males. More adolescents in urban areas (72.1 percent) than in rural areas (52 percent) had had their first sex with someone older. Similarly, 62.2 percent of those out of school compared to 56.7 percent of those in school had had their first sex with someone older.

Table 5-2. Demographic disaggregation of ever had sex and intergenerational sex among adolescents ages 12–14 years, AKAIS 2017

Variables	n	Ever had sex %	n	First sex with someone older %
Overall	392	22.1	86	57.2
Type of place of residence				
Urban	123	17.4	21	72.1
Rural	269	24.3	65	52.0
Gender				
Male	191	20.6	40	27.5
Female	201	23.4	46	81.5
Age (years)				
12	114	17.8	21	44.2
13	121	20.2	23	68.5
14	157	26.6	42	56.9
Schooling				
Currently in school	371	21.0	78	56.7
Not currently in school	21	41.9	8	62.2
Level of education for those currently in school				
Primary	70	12.4	8	-
Junior secondary	223	23.2	53	59.3
Senior secondary	78	22.1	17	-

A disaggregation by gender category of relative age of first sexual partner among adolescents ages 12–14 years is presented in Figure 5-1. More females than males had an older first sexual partner, at 81.5 percent of females and 27.5 percent of males. Whereas 29.2 percent of the males reported having a younger first sexual partner, none of the females reported having a younger first sexual partner.

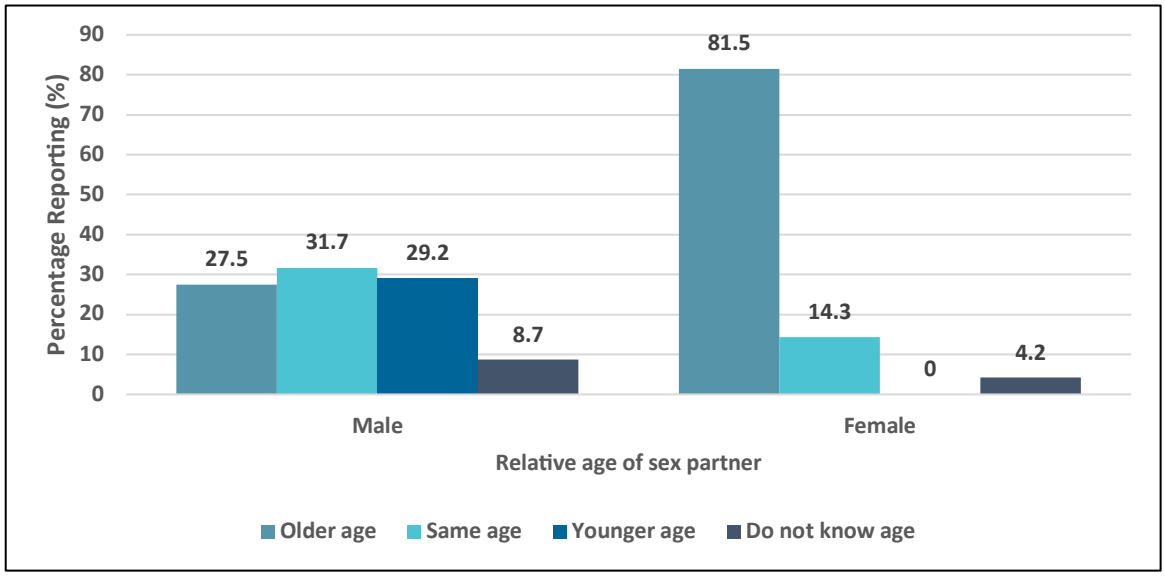


Figure 5-1. Relative age of first sexual partner among adolescents 12–14 years of age by gender category, AKAIS 2017

5.1.2. Self-efficacy and assertiveness among HIV-infected and uninfected adolescents

Among 392 adolescents ages 12–14 years who reported that they had ever heard of sex, 75 (18.8 percent) reported that they were pressured by boyfriends or girlfriends to have sex, while 354 (90.4 percent) said that they were able to refuse sexual advancements.

Table 5-3 shows a disaggregation by sexual exposure and demographic characteristics of adolescents who reported being pressured by friends to have sex, as well as those who reported the ability to refuse sexual advancements.

Among those who had ever had sex, 33.8 percent reported peer pressure, while 14.4 percent of those who had never had sex reported peer pressure. More females than males reported peer pressure to have sex, at 20.5 percent and 17.0 percent, respectively, and the ability to refuse sexual advancements, at 94.1 percent and 86.5 percent, respectively. Older adolescents reported more peer pressure to have sex than younger adolescents. A greater proportion of 13-year-olds (92.3 percent) reported the ability to refuse sex than the 12- and 14-year-olds.

Table 5-3. Disaggregation (by sexual exposure and demographic characteristics) of adolescents ages 12–14 years who reported peer pressure to have sex and ability to refuse sex, AKAIS 2017

Variables	n	Pressured by peers to have sex %	Able to refuse sex %
Ever had sex	86	33.8	88.6
Never had sex	304	14.4	90.9
No response	2	*	*
Gender			
Male	191	17.0	86.5
Female	201	20.5	94.1
Age			
12	114	13.8	89.5
13	121	15.4	92.3
14	157	25.2	89.6
Overall	**392**	**18.8**	**90.4**

**denominator less than 20 observations*

5.1.3. Alcohol and mood-altering drug use among adolescents ages 10–14 years

Figure 5-2 shows the proportion of adolescents ages 10–14 years who reported ever drinking alcohol and ever taking mood-enhancing drugs. Among the adolescents surveyed, 732 (40.8 percent) reported ever drinking alcohol, while 25 (1.4 percent) reported ever taking mood-enhancing drugs/substances.

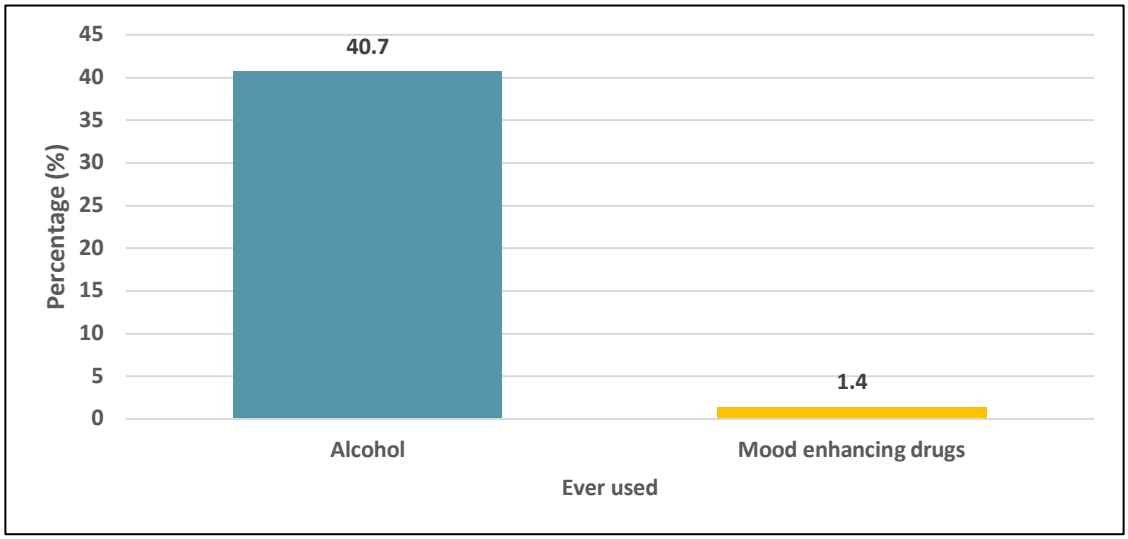


Figure 5-2. Alcohol and mood-enhancing drug use among adolescents ages 10–14 years, AKAIS 2017

Alcohol consumption is higher among males (44.8 percent) than females (36.2 percent) and in urban areas (41.1 percent) than rural areas (40.6 percent). More males than females had ever tried mood-enhancing drugs, at 1.6 percent and 1.2 percent, respectively. Adolescents in rural areas had a higher rate of mood-altering drug use (1.7 percent) than those in urban areas (0.7 percent).

5.2. Behavioral risk among people ages 15 years and older

5.2.1. Sexual behavior among people ages 15 years and older (sexual preferences, sexual debut, multiple sex partners, condom use)

This section presents the sexual behavior of adults surveyed, including exposure to sex (sexual debut), sexual preferences, condom use during sex, and number of sexual partners. These variables are disaggregated for sex and age categories, and the results are presented in Tables 5-4.

Sexual exposure among people ages 15 years and older

A total of 8,926 people ages 15 years and older responded to the question on ever having had sex. Overall, 90.6 percent of adults ages 15 years and older had ever had sex. Table 5-4 shows the sex and age disaggregation of sexual exposure among adults ages 15 years and older. Proportion of adults ages 15 years and older who had ever had sex was high across all age categories except for adults ages 15–19 years at 49.7 percent. The proportion of adults ages 15 years and older who had ever had sex was higher among females (91.9 percent) than males (89.0 percent).

Table 5-4. Sexual exposure among people ages 15 years and older, AKAIS 2017

Variable	n	%
Ever had sex	8,926	90.6
Gender		
Male	4,017	89.0
Female	4,909	91.9
Age category (years)		
15-19	1,358	49.7
20-24	1,130	90.8
25-29	1,120	97.5
30-34	1,004	99.1
35-39	857	99.3
40-49	1,281	99.7
≥50	2,176	99.5

Sexual preferences of people ages 15 years and older

Of the 8,080 people ages 15 years and older who had ever had sex, 8,073 (99.9 percent) said they had ever had vaginal sex, and 146 (1.8 percent) said they had ever had anal sex. The mean age of sexual debut was 18.95 (SD±4.95) years for vaginal sex and 21.1 (SD±6.10) years for anal sex. Anal sex was reported highest in 15- to 19-year-olds at 3.7 percent, and lowest in adults ages 50 years and older at 0.4 percent. The proportion of people who reported vaginal sexual preferences was high across all age categories. Ever having had vaginal sex was reported among 99.9 percent of females and 99.8 percent of males, while the ever having had anal sex was reported among 2.5 percent of males and 1.3 percent of females (Table 5-5).

Table 5-5. Sex and age disaggregation of ever having had vaginal sex among people ages 15 years and older, AKAIS 2017

Variable	n	Ever had vaginal sex %	Ever had anal sex %
Ever had sex	8,080	99.9	1.8
Gender			
Male	3,571	99.8	2.5
Female	4,509	99.9	1.3
Age category (years)			
15-19	673	100	3.7
20-24	1,027	99.6	2.9
25-29	1,091	100	2.8
30-34	955	100	2.8
35-39	851	99.9	1.4
40-49	1,277	100	1.0
≥50	2,166	99.8	0.4

Condom use during first sex among people ages 15 years and older

Of the 8,073 people who said they had ever had vaginal sex, 7,989 responded to the question on condom use. Of 7,989 people ages 15 years and older who had ever had vaginal sex, 1,284 (16.2 percent) reported condom use at first vaginal sex. Of the 146 people ages 15 years and older who said they had ever had anal sex, 34 (22.9 percent) reported condom use at first anal sex.

Gender disaggregation shows that 18.5 percent of males and 14.3 percent of females reported that they had used condoms during first vaginal sex, whereas for anal sex, 23.4 percent of males and 22.1 percent of females used condoms during first anal sex. The results of age disaggregation show that condom use during first sex (vaginal or anal) decreased with increasing age category. The proportion was highest in the age category 20–24 years for both vaginal sex (33 percent) and anal sex (46.6 percent). For anal sex among people ages 35 years and older, one out of 12 adults in the age category 35–39 years, two out of 13 adults in the age category 40–49 years, and no adult out of the nine who were 50 years and older reported condom use at first anal sex (Table 5-6).

Table 5-6. Gender and age disaggregation of condom use during first vaginal and anal sex among people ages 15 years and older, AKAIS 2017

Variable	Vaginal sex		Anal sex	
	n	%	n	%
Condom use at first sex	7,989	16.2	146	22.9
Gender				
Male	3,521	18.5	87	23.4
Female	4,468	14.3	59	22.1
Age category (years)				
15-19	660	31.2	26	42.6
20-24	1,014	33.0	30	46.6
25-29	1,079	31.2	29	14.1
30-34	986	19.4	27	7.2
35-39	842	13.2	12	*
40-49	1,265	6.0	13	*
≥50	2,143	1.5	9	*

**denominator is less than 20 observations*

Number of lifetime sexual partners

Number of lifetime sexual partners ranged from one to 100 with an average of one (mode of one). Among 7,869 people ages 15 years and older who reported their number of lifetime sex partners, 4,998 (63.7 percent) had had one lifetime sex partner, while 2,871 (36.3 percent) reported more than one lifetime partner. Table 5-7 shows the number of sexual partners (one vs. more than one) among adults and adolescents ages 15 years and older, disaggregated by sex and age. A higher proportion of females (71.8 percent) than males (53.2 percent) had had one lifetime sexual partner. Conversely, the proportion of males with more than one lifetime sexual partner was higher (46.8 percent) than for females (28.2 percent). The proportion of respondents with more than one lifetime sex partner was 32.6 percent in 15- to 19-year-olds, 44.6 percent in 20- to 24-year-olds and 25- to 29-year-olds, 44 percent in 30- to 34-year-olds, 40 percent in 35- to 39-year-olds, 34.7 percent in 40- to 49-year-olds, and 25.1 percent in people ages 50 years and older.

Table 5-7. Number of lifetime sexual partners among people ages 15 years and older by sex and age, AKAIS 2017

Variable	n	One lifetime sexual partner %	More than one lifetime sexual partner %
Overall	7,869	63.7	36.3
Gender			
Male	3,443	53.2	46.8
Female	4,426	71.8	28.2
Age category (years)			
15-19	667	67.4	32.6
20-24	1,012	55.5	44.6
25-29	1,062	55.5	44.6
30-34	977	56.0	44.0
35-39	826	60.0	40.0
40-49	1,243	65.3	34.7
≥50	2,082	74.9	25.1

Among people ages 15 years and older, 55 people reported having an anal sexual partnership in the 12 months preceding the survey: 39 (71.3 percent) had one partner, while 16 (28.7 percent) had more than one partner. Gender disaggregation showed that more males (39 percent) than females (10.8 percent) had more than one anal sexual partner.

5.2.2. Alcohol consumption and mood-altering drug use

Figure 5-3 shows the results for alcohol consumption among people ages 15 years and older. A total of 5,268 (58.8 percent) people in this age category that were surveyed said they had ever consumed alcohol. The proportion for frequency of consumption among those who took alcohol was 48.4 percent for at most once a month, 20.9 percent for two to four times a month, 20.7 percent for two to three times a week, and 10 percent for four or more times a week.

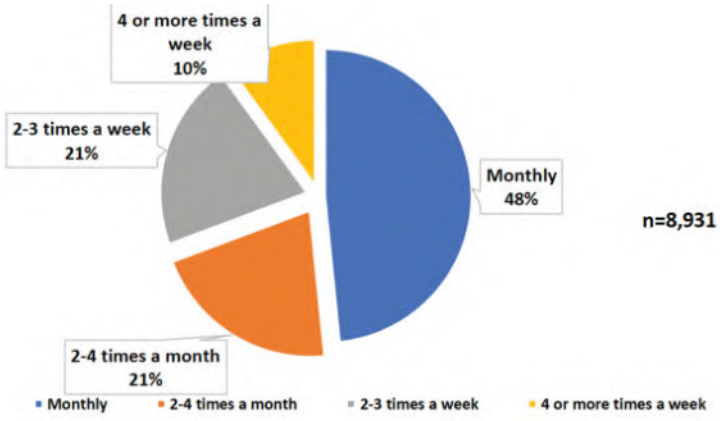


Figure 5-3. Frequency of alcohol consumption among adults and adolescents ages 15 years and older, AKAIS 2017

Use of various mood-enhancing drugs was reported by 787 (8.8 percent) people ages 15 years and older. The most common one used was Indian hemp (n=414 or 52.8 percent), followed by tobacco (n=361 or 46.0 percent) (Figure 5-4).

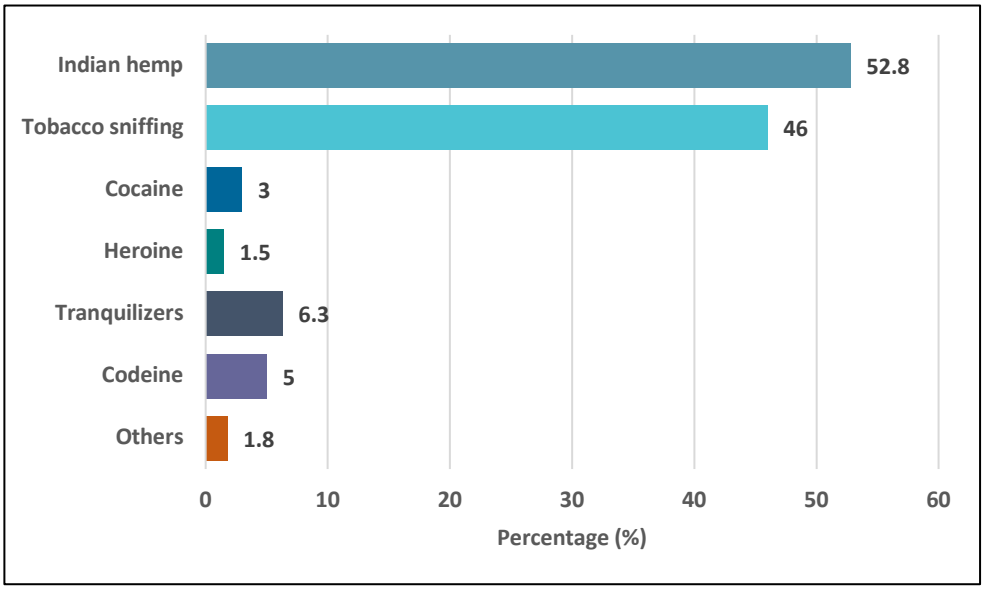


Figure 5-4. Types of mood-enhancing drug among adults and adolescents ages 15 years and older, AKAIS 2017

With respect to injection drug use for pleasure, 38 (0.4 percent), 8,851 (99.1 percent), and 42 (0.5 percent) of the survey participants reported ever injecting drugs for pleasure, never injecting drugs, and don't know, respectively. Out of the nine (23.7 percent) respondents that injected drugs for pleasure in the previous three months, two shared a syringe or needle with other people and one did not know the status of the person(s) with whom needles were shared.

Table 5-8 shows a disaggregation by demographic characteristics of people ages 15 years and older who had ever taken alcohol, ever used mood-enhancing drugs and ever injected drugs for pleasure. Females were less likely than males to have ever taken alcohol (45.3 percent vs. 75.4 percent), mood-enhancing drugs (2.3 percent vs. 16.7 percent), and injection drugs for pleasure (0.2 percent vs. 0.7 percent). Among the different age categories, those ages 35–39 years had the highest proportion of people who consumed alcohol (63.7 percent), ever used mood-enhancing drugs (11.7 percent), and ever injected drugs for pleasure (0.7 percent). Alcohol consumption was higher in rural areas (59.2 percent) compared to urban areas (58 percent). The proportion of people who had ever used mood-enhancing drugs was 9.2 percent in rural areas and 7.9 percent in urban areas, while the proportion for injection of drugs for pleasure was 0.5 percent in rural areas and 0.2 percent in urban areas.

Table 5-8. Demographic disaggregation of alcohol, mood-enhancing, and injection drug use among adults and adolescents ages 15 years and older, AKAIS 2017

Variable	Alcohol consumption		Ever used mood enhancing drugs		Ever injected drugs for pleasure	
	n	%	n	%	n	%
Condom use at first sex	8,931	58.8	8,963	8.8	8,931	0.4
Gender						
Male	4,020	75.4	4,031	16.7	4,020	0.7
Female	4,911	45.3	4,932	2.3	4,911	0.2
Age category (years)						
15-19	1,359	51.7	1,360	3.4	1,359	0.1
20-24	1,132	59.4	1,139	7.9	1,132	0.3
25-29	1,120	61.9	1,125	10.2	1,120	0.4
30-34	1,004	61.3	1,008	9.1	1,004	0.5
35-39	858	63.7	865	11.7	858	0.7
40-49	1,281	62.0	1,287	10.0	1,281	0.5
≥50	2,177	56.4	2,179	9.8	2,177	0.5
Place of residence						
Urban	2,744	58.0	2,755	7.9	2,744	0.2
Rural	6,187	59.2	6,208	9.2	6,187	0.5

Chapter 6:

Prevalence of HIV

CHAPTER SIX

HIV PREVALENCE

6.1 Key findings

OVERALL PREVALENCE OF HIV IN AKWA IBOM STATE

PREVALENCE AMONG AGES 0 MONTHS - 14 YEARS

0-14 YEARS	0-9 YEARS		10-14 YEARS	
POINT PREVALENCE	RURAL	URBAN	RURAL	URBAN
0.4%	0.4%	0.2%	0.9%	0%

PREVALENCE AMONG AGES 15 YEARS AND OLDER

POINT PREVALENCE OF HIV AMONG PEOPLE AGES 15 YEARS AND OLDER IN AKWA IBOM STATE WAS **4.8%**

PLACE OF RESIDENCE	Rural Areas 5.1%	Urban Areas 3.9%
SEXUAL BEHAVIOUR	Vaginal Sex 5%	Anal Sex 3.9%
NUMBER OF PARTNERS	One Lifetime Sex Partner 4.6%	More Than One Lifetime Sex Partner 5.7%

GENDER	Males 3.7%	Females 5.6%		
MARITAL STATUS	Single 3.1%	Married 4.8%	Co-habiting 3.4%	Previously Married 7.0%
EDUCATION	Any Schooling 4.6%	No Schooling 3.9%		

AKAIS 2017

6.1. Prevalence of HIV among children and adolescents ages 0 months – 14years

A total of 2,457 children ages 0–4 years, 2,371 ages 5–9 years, and 1,765 adolescents ages 10–14 years were tested for HIV in Akwa Ibom State.

6.1.1. Prevalence of HIV by demographic characteristics

Figure 6-1 shows the point prevalence of HIV in children and adolescents ages 0–14 years, disaggregated by age categories. Prevalence of HIV was 0.4 percent in children ages 0–4 years, 0.3 percent in children ages 5–9 years, and 0.6 percent in adolescents ages 10–14 years.

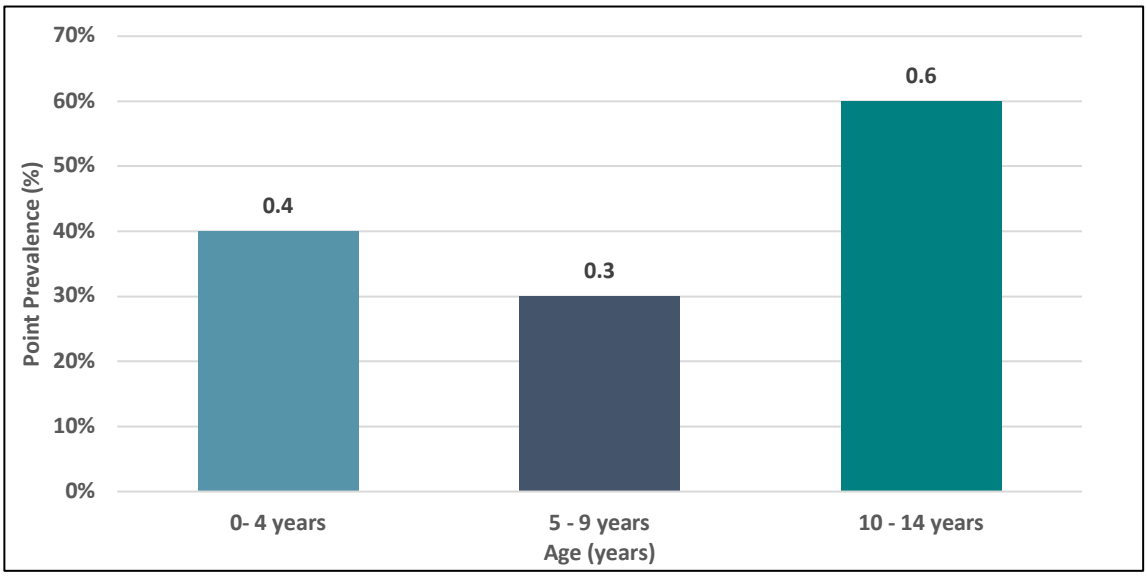


Figure 6-1. Point prevalence of HIV in children ages 0–14 years, AKAIS 2017

The prevalence of HIV is disaggregated by place of residence and gender for children 0–9 years and adolescents 10–14 years. Table 6-1 shows that HIV prevalence is higher in rural areas than urban areas for both age groups. In children ages 0–9 years, HIV prevalence was 0.2 percent in urban areas and 0.4 percent in rural areas. Among adolescents ages 10–14 years, HIV prevalence was 0 percent in urban areas and 0.9 percent in rural areas. When disaggregated by gender, HIV prevalence was marginally higher in females than males ages 0–9 years, and higher in males ages 10–14 years than their female counterparts. Prevalence among children ages 0–9 years was 0.3 percent in males and 0.4 percent in females. Among adolescents ages 10–14 years, HIV prevalence was 0.8 percent in males and 0.4 percent in females.

Table 6-1. HIV prevalence disaggregated by place of residence and gender for children 0–9 years and adolescents 10–14 years of age, AKAIS 2017

Variables	Children ages 0-9 years			Adolescents ages 10-14 years		
	n	% HIV positive	95% C.I	n	% HIV positive	95% C.I
Point prevalence	4,828	0.4	0.2 , 0.6	1,765	0.6	0.3 – 1.2
Gender						
Male	2,409	0.3	0.2 – 0.7	740	0.8	0.4– 1.6
Female	2,419	0.4	0.2 – 0.8	825	0.4	0.2 – 1.2
Place of residence						
Urban	1,382	0.2	0.1 – 0.7	524	-	-
Rural	3,446	0.4	0.3 – 0.7	1,241	0.9	0.5 , 1.7

Figure 6-2 shows the HIV prevalence values by LGA of residence for children ages 0–9 years. The highest HIV prevalence rate among children was recorded in Ibeno at 3.2 percent. Oruk Anam had an HIV prevalence of 1.3 percent among children tested during the survey. No HIV-positive children were found in 17 LGAs. The rest of the LGAs had HIV prevalence values of less than 1 percent.

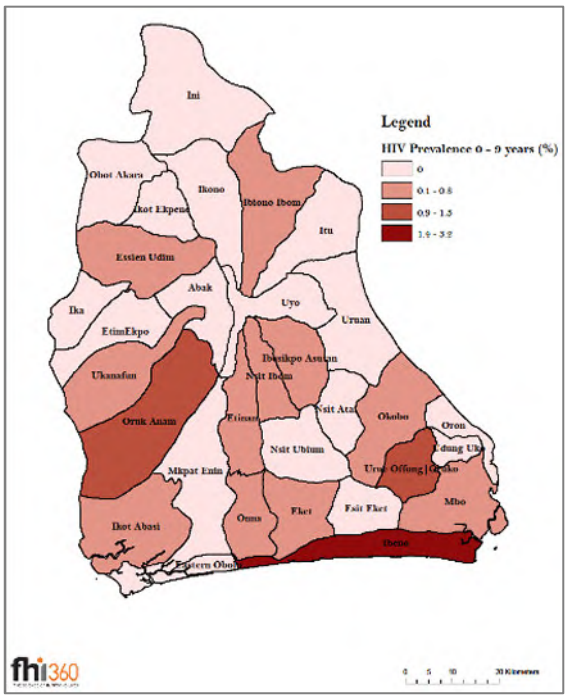


Figure 6-2. HIV prevalence among children ages 0–9 years and older disaggregated by LGA of residence, AKAIS 2017

In Figure 6-3, we present HIV prevalence figures for adolescents ages 10–14 years disaggregated by LGA of residence. It was found that the three highest HIV prevalence values were 3.6 percent in Obot Akara, 2.6 percent in Ika, and 2.1 percent in Etim Ekpo LGAs. No HIV-positive people were found in 21 LGAs among adolescents ages 10–14 years tested during the survey.

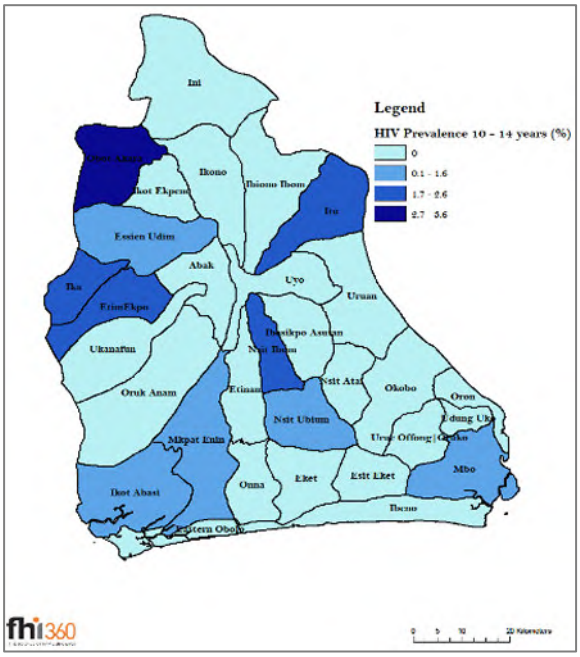


Figure 6-3. HIV prevalence among adolescents ages 10–14 years and older disaggregated by LGA of residence, AKAIS 2017

6.1.2. Prevalence of HIV by sexual behavior among adolescents ages 12–14 years

Among adolescents ages 12–14 years, no one reported that they had ever been married. Table 6-2 shows the HIV prevalence by sexual behavior among adolescents ages 12–14 years. HIV prevalence was higher among those who had ever had sex, at 1.1 percent, compared to those who had never had sex, at 0.3 percent. Prevalence among those who had ever had vaginal sex was 1.1 percent. None of the adolescents ages 12–14 years reported that they had ever had anal sex, and none of the two who reported that they had ever had oral sex tested positive for HIV. HIV prevalence was 1.3 percent among adolescents ages 12–14 years who reported that they had had one lifetime sex partner, while none of the 14 adolescents ages 12–14 years who reported that they had had more than one sexual partner tested positive for HIV. One of the eight adolescents ages 12–14 years who had used a condom at first sex tested HIV positive, and none tested positive for HIV among those who did not use a condom at first sex. None of the 11 adolescents ages 12–14 years who reported that they had ever had sex for material support tested HIV positive.

Table 6-2. Prevalence of HIV by sexual behavior among adolescents ages 12–14 years, AKAIS 2017

Variable	n	% HIV positive	95% C.I
Ever had sex	84	1.1	0.2, 7.4
Never had sex	295	0.3	0.04 , 2.2
Ever had vaginal sex	83	1.1	0.2, 7.5
Condom use at first sex	8	*	*
Did not use condom at first sex	75	0	*
One sexual partner	70	1.3	0.2, 9.1
More than one sexual partner	14	*	
Ever had sex for material support	11	*	

*denominator less than 20 observations

6.2. Prevalence of HIV among people ages 15 years and older

A total of 8,306 people ages 15 years and older were tested for HIV in Akwa Ibom State. The point prevalence of HIV among people ages 15 years and older in Akwa Ibom State was 4.8 percent. Table 6-3 and Figures 6-4 show the HIV

prevalence values disaggregated by age category, gender, place of residence (urban vs. rural), LGA of residence, any schooling, highest level of education, employment status, and mobility.

6.2.1. Prevalence of HIV by demographic characteristics (age, place of residence, LGA, marital status, education, mobility/migration)

The point prevalence of HIV disaggregated by selected socio demographics for people 15 years of age and older is presented in Table 6-3. The highest prevalence rates were observed in adults ages 35–39 years, followed by those ages 30–34 years. HIV Prevalence by five-year age category shows rates of 1.5 percent in people ages 15–19 years, 4.7 percent in adults ages 20–24 years, 5.3 percent in adults ages 25–29 years, 7.3 percent in those ages 30–34 years, 7.6 percent in adults ages 35–39 years, 6.3 percent in those ages 40–49 years, and 3.3 percent in adults ages 50 years and older.

Table 6-3. HIV prevalence among adults ages 15 years and older by selected sociodemographics, AKAIS 2017

Variable	Total tested	Number HIV positive	% HIV positive	95% C.I
Adults ≥ 15 years	8,306	394	4.8	4.2 , 5.3
Residence				
Urban	2,534	102	3.9	3.2, 4.8
Rural	5,772	292	5.1	4.5, 5.9
Sex				
Male	3,715	136	3.7	3.0, 4.4
Female	4,591	258	5.6	4.9, 6.4
Age group				
15-19	1,297	20	1.5	1.0 , 2.3
20-24	1,075	50	4.7	3.6 , 6.0
25-29	1,043	57	5.3	4.1 , 7.0
30-34	925	65	7.3	5.7, 9.4
35-39	789	61	7.6	5.8, 9.7
40-49	1,184	74	6.3	5.0, 7.9
≥50	1,993	67	3.3	2.6, 4.3
Education				
Ever attended school	7,479	346	4.6	4.1, 5.2
Never attended school	808	31	3.9	2.7, 5.5
Missing	19	17	*	
Educational status				
No education	828	31	3.8	2.7, 5.4
Primary	2,437	152	6.3	5.3, 7.6
Secondary	3,953	167	4.2	3.6, 4.8
Tertiary	1,066	27	2.5	1.7, 3.6
Missing	22	17	*	
Marital status				
Single	2,996	93	3.1	2.5, 3.8
Married	3,641	176	4.8	4.1, 5.7
Cohabiting	180	6	3.4	1.5, 7.5
Previously married	1,452	102	7.0	5.8, 8.5
Missing	37	17	*	
Employment status				
Done any work in the last 12 months for which cash or kind was received as payment	3,204	153	4.8	4.0, 5.7
No work was done in the last 12 months for which cash or kind was received as payment	5,082	224	4.4	3.8, 5.1
Missing	19	17		

HIV prevalence was higher in rural areas, at 5.1 percent, compared to urban areas, at 3.9 percent for persons ages 15 years and older. HIV prevalence was higher in females (5.6 percent) than males (3.7 percent) ages 15 years and older.

HIV prevalence was highest among the previously married (7 percent). HIV prevalence values were 4.8 percent among married people and 3.4 percent among cohabitating partners. HIV prevalence was 4.8 percent among those who had done any work in the 12 months preceding the survey, compared to 4.4 percent among those who had not.

With respect to schooling, HIV prevalence was higher among those who had had any schooling, at 4.6 percent, compared to those who had had no schooling, at 3.9 percent. When disaggregated by level of education, prevalence of HIV was 3.8 percent among those who had no education, 6.3 percent among those who had a primary education only, 4.2 percent among those whose highest level of education was secondary, and 2.5 percent among those who had tertiary education. HIV prevalence among those who had traveled outside of their community in the 12 months preceding the survey was 4.6 percent compared to 4.5 percent in those who had not (Table 6-3).

Figure 6-4 shows HIV prevalence for each of the 31 LGAs in Akwa Ibom State. HIV positivity was recorded in all 31 LGAs. Prevalence ranged from lowest 1.9 percent in Ikot Abasi to highest 13.2 percent in Ibeno.

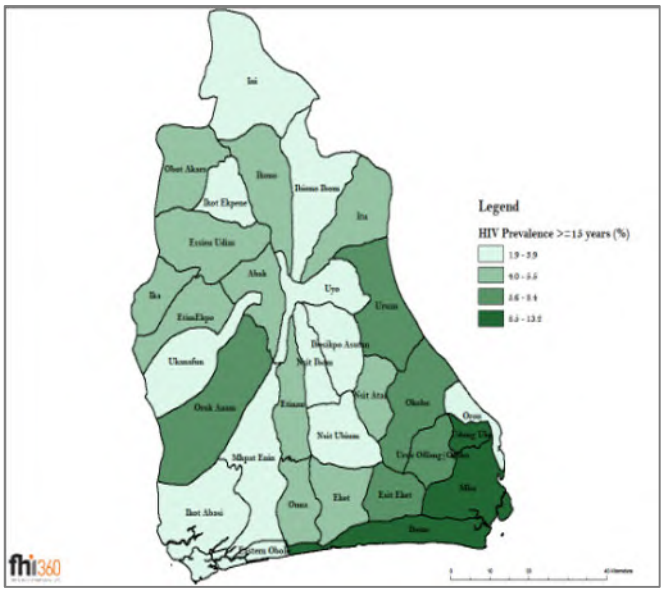


Figure 6-4. HIV prevalence among people ages 15 years and older disaggregated by LGA of residence, AKAIS 2017

6.2.2. Prevalence of HIV by sexual orientation and behavior

HIV prevalence was higher among those who had ever had sex, at 4.9 percent, compared to those who had never had sex, at 0.6 percent. Prevalence among those who had ever had vaginal sex was 5 percent while prevalence among those who had ever had anal sex was 3.9 percent. Other related findings are presented in Table 6-4.

Table 6-4. HIV prevalence among adults ages 15 years and older by sexual behavior, AKAIS 2017

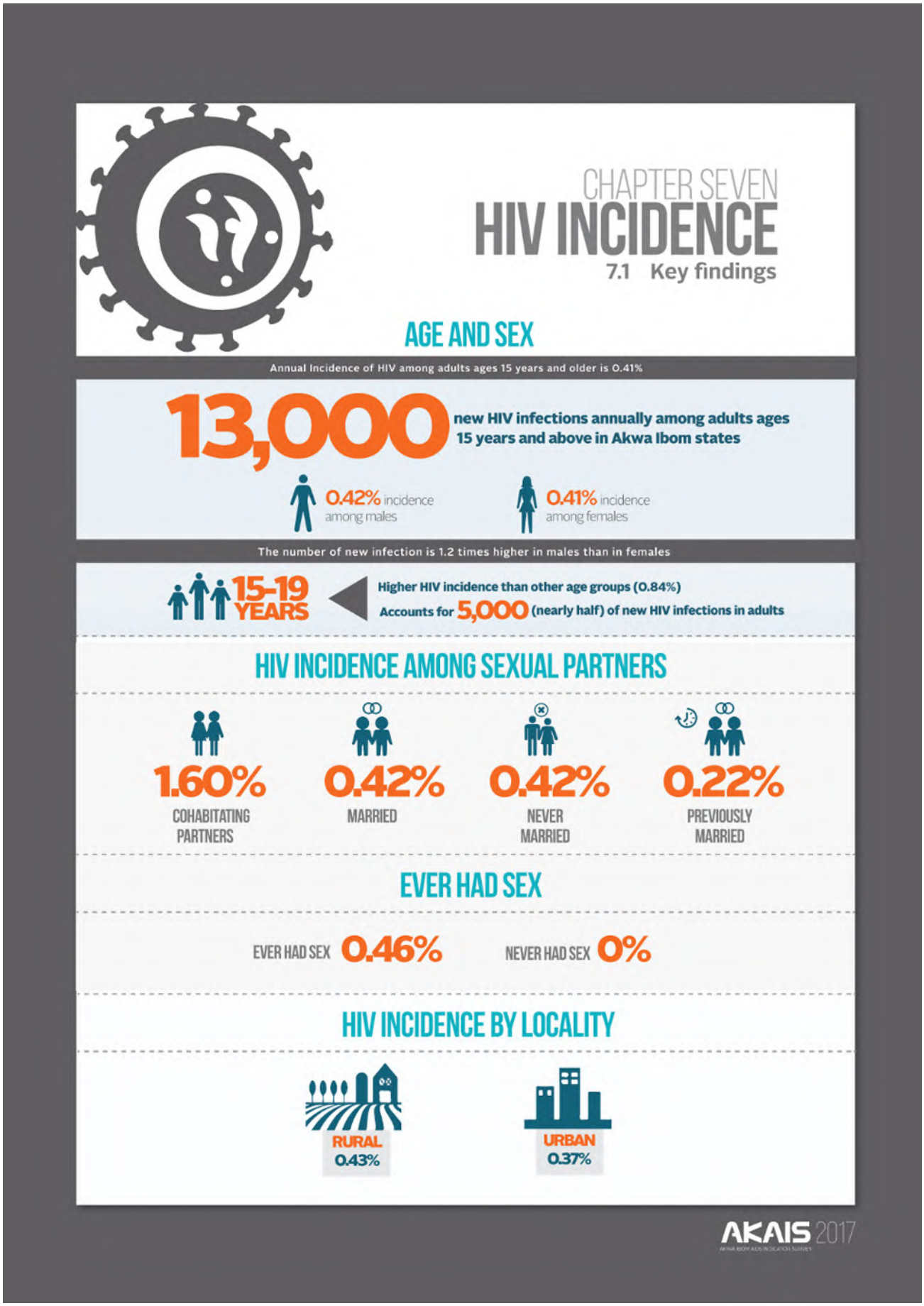
Variable	Total tested	% HIV positive	95% C.I
Ever had sex	7,145	4.9	4.3, 5.5
Never had sex	801	0.6	0.2, 1.5
Ever had vaginal sex	7,392	5.0	4.4, 5.7
Ever had anal sex	137	3.9	1.6, 9.2
Condom use			
Condom use at first vaginal sex	1,196	4.7	3.6, 6.1
No condom use at first vaginal sex	6,130	5.1	4.5, 5.8
Don't know	54	3.8	0.9, 14.0
Condom use at first anal sex	32	0	
No condom use at first anal sex	103	5.2	2.2, 12.0
Number of lifetime sexual partner			
1	4,638	4.6	4.0, 5.2
>1	2,687	5.7	4.7, 6.9

Prevalence among those who had used a condom at first vaginal sex was 4.7 percent compared to 5.1 percent among those who did not use a condom at first vaginal sex. For those who had anal sex, HIV prevalence was 0 percent among those who had used a condom at the first anal sex, and 5.2 percent among those who had not.

HIV prevalence by number of sex partners in the past 12 months is described below. HIV prevalence was 4.6 percent among those who reported that they had had one lifetime sex partner, compared to 5.7 percent among those who reported having more than one lifetime sex partner.

Chapter 7:

HIV Incidence


CHAPTER SEVEN
HIV INCIDENCE
7.1 Key findings
AGE AND SEX
Annual Incidence of HIV among adults ages 15 years and older is 0.41%
13,000
new HIV infections annually among adults ages 15 years and above in Akwa Ibom states
0.42% incidence among males
0.41% incidence among females
The number of new infection is 1.2 times higher in males than in females
15-19 YEARS
Higher HIV incidence than other age groups (0.84%)
Accounts for 5,000 (nearly half) of new HIV infections in adults
HIV INCIDENCE AMONG SEXUAL PARTNERS
1.60% COHABITATING PARTNERS
0.42% MARRIED
0.42% NEVER MARRIED
0.22% PREVIOUSLY MARRIED
EVER HAD SEX
EVER HAD SEX 0.46%
NEVER HAD SEX 0%
HIV INCIDENCE BY LOCALITY
RURAL 0.43%
URBAN 0.37%
AKAIS 2017

7.1. HIV incidence estimates with laboratory-based LAg-Avidity assay

HIV-incidence measurement provides understanding of the impact of HIV-prevention programs implemented in Akwa Ibom State. HIV-incidence analysis from this survey was based on direct HIV-incidence measurements using a laboratory-based testing algorithm and is presented in both relative terms (percentage per year) and absolute terms (number of new infections per year). Sedia LAg Plasma, DBS, and Bio-Rad LAg were evaluated according to the recommended protocol.

A total of 8,306 men and women of 15 years and older (unweighted) were initially tested in the household. Of these, 394 were HIV seropositive (HIV-1: 393; HIV-2: 1) following HIV confirmatory testing in the laboratory. A total of 370 eligible HIV-1 seropositive specimens were further tested for recent infection using the new LAg-Avidity EIA. The weighted and unadjusted HIV-1 incidence estimates by the Sedia plasma LAg-Avidity EIA was 0.72/100 PY, while the adjusted HIV-1 incidence after exclusion of individuals with low viral load (<1000 copies/ml) was 0.41/100 PY. The Sedia LAg avidity EIA DBS assay incidence was twice the plasma LAg assay (0.85 /100 PY), while Bio-Rad LAg assay was 0.32/100 PY when adjusted with low viral load using 333 days for mean duration of recent infection. Total individuals testing recent as observed for Bio-Rad following adjustment with low viral load was twice the number tested on the Sedia LAg Plasma assay (Table 7-1).

Table 7-1. Comparison of HIV incidence estimates with laboratory-based LAg-Avidity assays

Lab Based Assay	Adjustment	No. tested / No Recent	HIV Incidence per 100 PY (95% CI)
Sedia Plasma LAg-Avidity Assay (MDRI=130 days)	None	370 / 19	0.72 / 100 PY
	Viral suppression (< 1000 copies/ml)	370 / 11	0.41 / 100 PY
Sedia DBS LAg-Avidity Assay (MDRI=130 days)	None	363 / 35	1.35 / 100 PY
	Viral suppression (< 1000 copies/ml)	363 / 22	0.85 / 100 PY
Biorad LAg-Avidity Assay (MDRI=333* days)	None	370 /28	0.41 /100 PY
	Viral suppression (< 1000 copies/ml)	370 / 22	0.32 /100 PY

MDRI: mean duration of recent infection for the test specified in days *333 days was specified for Bio-Rad methodology by CEPHIA project team.

7.2. Incidence of HIV by demographic characteristics ages 15 years and older

Our analysis revealed 0.41 percent annual incidence of HIV among adults ages 15 years and older. This translates to 13,000 new cases of HIV infections annually in persons 15 years and older (Table 7-1). The HIV incidence rates were marginally similar in females (0.41 percent) and males (0.42 percent). The number of new infections was 1.2 times higher in males than females. The HIV incidence in people ages 15–19 years was 0.84 percent, translating to 5,000 estimated new infections, thus accounting for nearly half of the new infections occurring in the state. There were no new infections found in respondents ages 20–24 years. HIV incidence in ages 25–29 years was 0.28 percent, with about 1,000 new cases of infection, while ages 30–34 years was 0.35 percent. HIV incidence in people ages 35–39 years was second highest at 0.76 percent (Table 7-2).

Table 7-2. HIV incidence (percentage) and number of new infections by age and sex among participants ages 15 years and older

Age groups (Years)	HIV Incidence % (95% CI)	Estimated No. of New Infections*
15yrs and above	0.41 (0.16-0.66)	13000 (5000 – 21000)
Male	0.42 (0.05-0.79)	7000 (800 -13000)
Female	0.41 (0.08 -0.74)	6000 (1200 – 12000)
15-19	0.84 (0.00-1.78)	5000 (0 -11000)
20-24	0.00 (N.D)	-
25-29	0.28 (0.00-0.83)	1000 (0 – 4000)
30-34	0.35 (0.00-1.05)	1000 (0- 3000)
35-39	0.76 (0.00-1.82)	2000 (0 -5000)
40-49	0.53 (0.00-1.27)	2000 (0- 6000)
≥50	0.31 (0.00-0.74)	2000 (0 – 4000)

N.D: Not Determined; * numbers were rounded off to the nearest thousand

7.3. Incidence of HIV by behavior

Table 7-3 shows the HIV incidence by selected behavioral and sociodemographic characteristics among adults ages 15 years and older. The HIV incidence by education showed that the majority of the new infections occurred among people with a secondary school level of education, 0.61 percent compared to 0.38 percent among those with primary school education. No new infections were found among those without education and those with tertiary education.

HIV incidence by marital status revealed that those cohabitating with a sexual partner reported the higher incidence of 1.60 percent compared to married, never married, and previously married people, whose rates were 0.42 percent, 0.42 percent, and 0.22 percent incidence, respectively. Respondents who reported ever having sex had an HIV incidence of 0.46 percent, while no new infections were found among those who had never had sex. Analysis of HIV incidence by place of residence revealed a higher incidence rate in rural than urban areas (0.43 percent vs. 0.37 percent).

Table 7-3. HIV incidence (percentage) by behavioral and sociodemographic factors among participants age 15 years and older

Variable	n (Number of persons tested)	HIV Incidence % (95% CI)
Level of education		
None	807	0.00 (N.D)
Primary	2421	0.38 (0.00-0.82)
Secondary	3955	0.61 (0.18-1.04)
Tertiary	1096	0.00 (N.D)
Marital Status		
Never Married	2998	0.42 (0.00-0.83)
Married	3647	0.42 (0.05-0.80)
Previously Married	1439	0.22 (0.00-0.65)
Cohabiting	180	1.60 (0.00-4.68)
Sexual		
Ever Had Sex	7475	0.46 (0.18 – 0.73)
Never Had Sex	796	0.0 (N.D)
Location		
Urban	2633	0.37 (0.00-0.78)
Rural	5668	0.43 (0.13-0.74)

N.D Not Determined

Chapter 8:

Reported HIV Program Participation Among Respondents who self-identified as HIV positive

CHAPTER EIGHT

REPORTED HIV PROGRAM PARTICIPATION AMONG RESPONDENTS

8.1 Key findings

PREVIOUS HCT COVERAGE AMONG RESPONDENTS

HIV TESTING 0-14 YEARS

14.2% children ages 0 month to 14 years reported to have ever tested for HIV

19% Urban testing rate

12% Rural testing rate

HIGHEST TESTING RATES Okobo LGA (37.4%), Oron LGA (35.2%), Ikot-Ekpene LGA (33.6%)

LOWEST TESTING RATES Esit-Eket LGA (2.0%), Mbo LGA (2.6%), Ini LGA (2.9%)

0.4% 3 out of 675 children 0-14 tested positive to HIV. Only 2 were currently taking ARVs

HIV TESTING 15 YEARS AND OLDER

47% 15 years and older reported to have ever tested for HIV

57.7% Urban testing rate

42.1% Rural testing rate

HIGHEST TESTING RATES Okobo LGA (83.5%), Uruan LGA (75.3%), Oron LGA (70.4%)

LOWEST TESTING RATES Udung-Uko LGA (26%), Ini LGA (26.9%), Oruk-Anam LGA (27.4%)

Testing rate was higher among females (48.4%) than males (45.4%), higher in those who had any form of schooling (49.4%), than those who did not (24.8%)

HIV CARE AND TREATMENT PROGRAM COVERAGE

FOR RESPONDENTS 15 YEARS AND OLDER

- Ever received care from a healthcare provider who self-reported HIV positive: **78.1%**
- Access to ARVs (i.e. currently on ARVs) - Males: **74.0%**
- Access to ARVs (i.e. currently on ARVs) - Females: **83.1%**
- Ever had viral load testing: **45.9%**
- Travel time to ARVs - less than one hour: **66.3%**
- Coverage of ARVs - Urban: **81.9%**
- Coverage of ARVs - Urban: **80.1%**
- Coverage of viral load testing - Urban: **55.3%**
- Coverage of viral load testing - Rural: **37.9%**
- Travel time to ARVs - one to two hours: **22.9%**
- Median travel cost: **N225**

AKAIS 2017
AKWA IBOM AIDS INDICATOR SURVEY

8.1. Previous HIV counseling and testing coverage among respondents

8.1.1. HIV testing among people 0–14 years

Information on HIV testing among children 0–9 years and adolescents 10–14 years is discussed in this section. The HIV testing rate (that is, ever tested for HIV prior to the survey) was disaggregated by age category, gender, place of residence (urban vs. rural), and LGA of residence. Data on HIV testing were reported by parents and guardians for children ages 0–14 years. The HIV testing status was reported for 4,792 children in this age category. Overall, 675 (14.2 percent) of the children ages 0–14 years were reported to have ever tested for HIV.

The proportion that had ever tested for HIV was 14.1 percent among females and 14.3 percent among males. The HIV testing rate was higher in urban areas (19.0 percent) than rural areas (12.0 percent) among children ages 0–14 years. Disaggregation of HIV testing by age category showed a reduction in proportion of people who had ever tested for HIV with increasing age. The testing rate among children ages 0–4 years was 16.7 percent, followed by 14.2 percent in 5- to 9-year-olds and 10.7 percent in those 10–14 years (Table 8-1).

Table 8-1. HIV testing rate disaggregated by demographic characteristics among children ages 0–14 years, AKAIS 2017

Demographic Variables	n	%
Gender		
Male	2,398	14.3
Female	2,394	14.1
Residence		
Urban	1,493	19.0
Rural	3,299	12.0
Age category (in years)		
0 – 4	1,841	16.7
5 – 9	1,726	14.2
10 – 14	1,225	10.7

8.1.2. HIV testing among people ages 15 years and older

Information on HIV testing and disclosure as reported among people ages 15 years and older is discussed in this section. The HIV testing rate is disaggregated by age, gender, place of residence (urban vs. rural), and LGA of residence.

Among the 8,933 people ages 15 years and older who responded to the questions on HIV testing, 4,175 (47 percent) reported that they had ever been tested for HIV. Over a third (34.3 percent) last tested one to two years preceding the survey. The majority reported that their last HIV test was done at a health center (42.7 percent), followed by mobile HTS units (22.6 percent), hospital outpatient clinic (10.4 percent), and at home (10.2 percent) (Table 8-2).

Table 8-2. HIV testing rate and location among people ages 15 years and older

Variables	Percentage

Ever tested for HIV (n=4,175)	
Time of last testing	
<3months ago	13.3
3–5 months ago	13.3
6–11 months ago	18.6
1–2 years ago	34.3
>2 years ago	20.2
Do not know	0.2
Place of last testing	
HTS facility	3.3
Mobile HTS	22.6
At home	10.2
Health clinic	42.7
Antenatal clinic	4.8
Hospital (general) outpatient clinic	10.4
Hospital inpatient wards	1.1
*Others	4.8
Do not know	0.1

*Includes health facilities such as STI and family planning clinics, blood donation centers, pharmacy and patent medicine stores, and non-health facilities such as school and church outreach.

Disaggregation of HIV testing among people ages 15 years and older by demographic characteristics is presented in Table 8-3 below. The HIV testing rate was higher among females (48.4 percent) than males (45.4 percent) and in urban areas (57.7 percent) than rural areas (42.1 percent). The HIV testing rate varied by age category. It was highest among adults ages 30–34 years (64.7 percent) and lowest in the age category of 15–19 years (27.3 percent). The HIV testing rate was higher among those who had any form of schooling (49.4 percent) than those who did not (24.8 percent). HIV testing also increased with level of education.

HIV testing varied by employment variable measured. Testing rates among people who had worked and received cash in the previous 12 months and the previous seven days were both 56.9 percent. The testing rate among unemployed people was 56.2 percent, and 43.2 percent among students. The HIV testing rate of 55.9 percent was observed among people who reported that they had traveled out of their community in the 12 months preceding the survey.

Table 8-3. HIV testing rates disaggregated by other demographic characteristics among people ages 15 years and older, AKAIS 2017

Demographic variables	n	%
Gender		
Male	4,021	45.4
Female	4,912	48.4
Age category		
15 -19	1,359	27.3
20 – 24	1,133	51.9
25 – 29	1,120	62.0
30 – 34	1,004	64.7
35 – 39	858	56.6
40 – 49	1,282	51.4
≥50	2,177	34.4
Schooling		
Any schooling	8,059	49.4
No schooling	874	24.8
Level of education		
None	895	25.3
Primary	2,637	38.0
Secondary	4,222	47.2
Tertiary	1,176	81.8
Employment		
Received cash for work done in 12 months preceding survey	3,488	56.9
Received cash for work done in 7 days preceding survey	2,308	56.9
Unemployed	96	56.2
Student	124	43.2
Mobility		
Travelled out of community in 12 months preceding survey	3,629	55.9

Figure 8-1 shows the HIV testing rate among children and surveyed adolescents ages 10–14 years in the 31 LGAs. Overall, 675 (14.2 percent) children ages 0–14 years were reported to have ever tested for HIV. The highest proportion of those who had ever tested for HIV was reported in Okobo LGA (37.4 percent), followed by Oron (35.2 percent), Ikot Ekpene (33.6 percent), and Uruan (30.1 percent). Three LGAs had testing rates of less than 5 percent, namely Esit Eket (2.0 percent), Mbo (2.6 percent), and Ini (2.9 percent). The remaining LGAs had HIV testing rates of less than 30 percent.

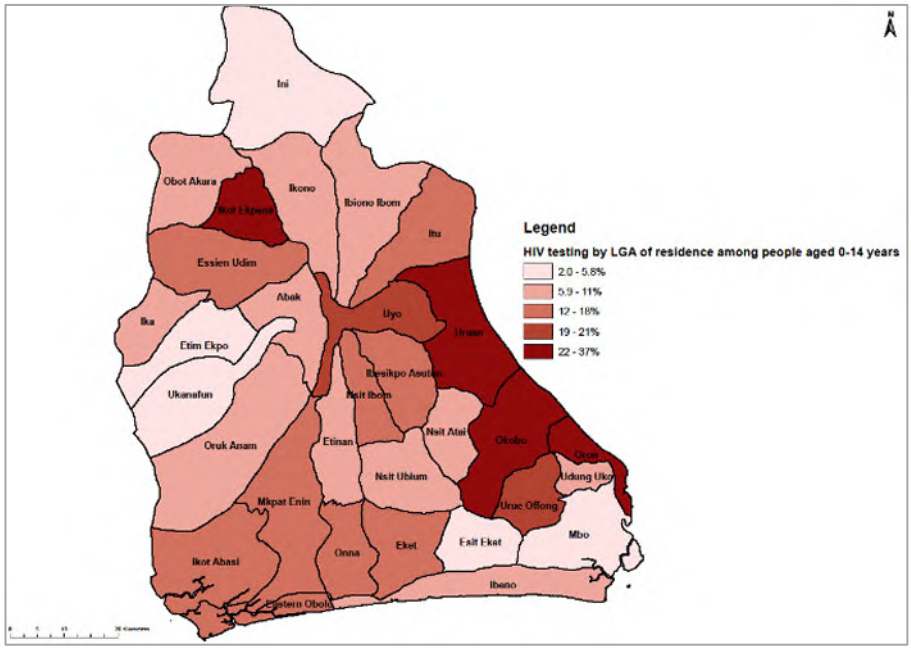


Figure 8-1. HIV testing among children and adolescents ages 0–14 years disaggregated by LGA of residence, AKAIS 2017

HIV testing rates varied by LGA of residence among adults ages 15 years and older and ranged from 26 percent to 83.5 percent (Figure 8-2). The highest testing rates for adults and adolescents ages 15 years and older were reported in Okobo (83.5 percent), Uruan (75.3 percent), Oron (70.4 percent), Uyo (67.8 percent), and Ikot-Ekpene (67.6 percent). Some LGAs had testing rates of over 50 percent, such as Eastern Obolo (57.7 percent), Eket (52.6 percent), Ibesikpo-Asutan (52.3 percent), Ikot-Abasi (52.4 percent), and Itu (56.9 percent). Some others such as Udung-Uko, Ini, Oruk-Anam, and Obot-Akara had HIV testing rates of less than or equal to 30 percent.

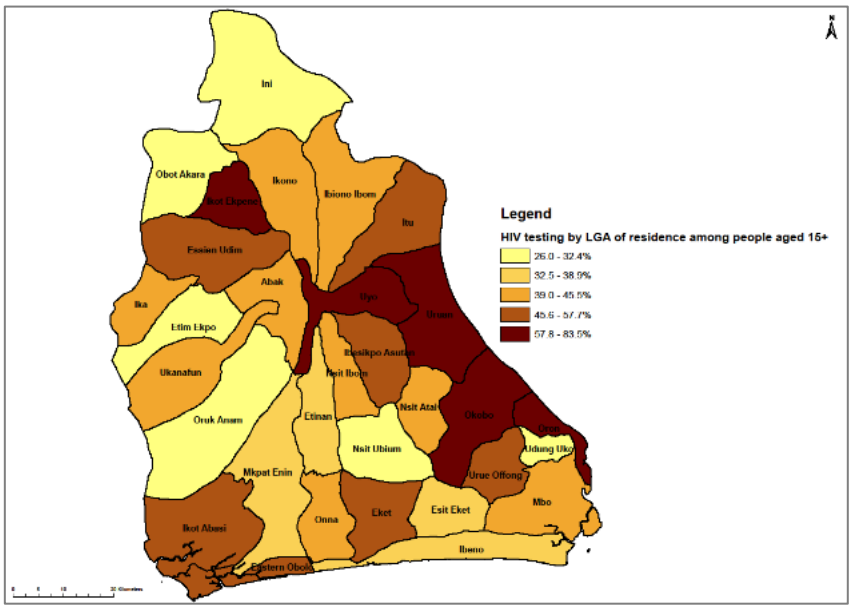


Figure 8-2. HIV testing among adults and adolescents ages 15 years and older disaggregated by LGA of residence, AKAIS 2017

8.2. HIV care and treatment program coverage

8.2.1. HIV care and treatment coverage of HIV-infected children ages 0–14 years (enrollment in care, access to and coverage of ART and co-trimoxazole)

Information on HIV treatment, care, and support was collected from parents and guardians for children ages 0–9 years and adolescents ages 10–14 years who reported testing HIV positive. Data are reported for whether they received medical care from a health care provider and had access to ARVs, viral load testing, and co-trimoxazole for opportunistic infections. The results showed that of the 675 children reported to have ever been tested for HIV, three (0.4 percent) were said to have tested positive for HIV. All three children were said to have ever received HIV medical care from a health care provider. With respect to access to ARVs, whereas all three children were said to have ever received ARVs for treatment of HIV, only two out of three children were reported to be currently taking ARVs. All three children were also reported to have access to co-trimoxazole.

8.2.2. HIV care and treatment coverage of HIV-infected adults and adolescents ages 15 years and older (enrollment in care, access to and coverage of ART and co-trimoxazole, and viral load testing)

Information on HIV treatment, care, and support was collected from adults ages 15 years and older who reported testing HIV positive. Data are disaggregated by place of residence, age category, and gender for whether they received care from health care workers and had access to ARVs, viral load testing, and co-trimoxazole for opportunistic infections. The results are presented in this section.

A total of 70 (78.1 percent) people ages 15 years and older who self-reported a positive HIV test result said that they had ever received care from a health care provider. Disaggregation by demographic characteristics shows that 68.8 percent of the males and 81.3 percent of the females surveyed had ever received HIV medical care from a health care provider, and 90.9 percent of self-reported HIV-positive people in urban areas had access to medical care from a health care provider compared to 67 percent of people in the rural areas.

Of the 70 people who reported ever receiving care for HIV care from a health worker, 67 (95.3 percent) reported ever receiving ARVs, and 54 (81.1 percent) of those who had ever taken ARVs were currently taking ARVs. Access to ARVs (i.e., currently on ART) was 74 percent among males and 83.1 percent among females. Among the age categories, only self-reported HIV-positive people ages 15–19 years and 50 years and older had full access to ARVs. Coverage of ARVs was 81.9 percent in urban areas and 80.1 percent in rural areas (Table 8-4).

Table 8-4. Access to ARVs among adults and adolescents ages 15 years and older, AKAIS 2017

Variable	Ever taken ARVs		Currently on ARVs	
	N	Weighted %	N	Weighted %
	70	95.3	67	81.1
Gender				
Male	16	92.2	15	74.0
Female	54	96.3	52	83.1
Age category				
15 -19	1	*	1	*
20 – 24	6	*	6	*
25 – 29	10	*	10	*
30 – 34	14	*	13	*
35 – 39	9	*	8	*
40 – 49	16	*	15	*
≥50	14	*	14	*
Place of residence				
Urban	37	94.7	35	81.9
Rural	33	96.1	32	80.1

**denominator is less than 20 observations*

Among the self-reported HIV-positive people ages 15 years and older who reported ever receiving HIV medical care from a health care provider, 32 (45.9 percent) had ever had viral load testing. Twenty (62.8 percent) were told the result of the viral load test. A disaggregation of viral load testing by demographic characteristics shows that testing was 71.0 percent among males and 38.5 percent among females. Coverage of viral load testing was 55.3 percent in rural areas and 37.9 percent in urban areas.

A total of 45 (62.8 percent) of those who had ever received medical care for HIV from a health care provider were currently taking co-trimoxazole. Access was 65.4 percent among females and 53.9 percent among males.

8.2.3. Travel time and transport cost to health facilities among HIV-infected adults and adolescents 15 years and older

Figure 8-3 shows the results of estimates of travel time from home or workplace to a health facility among 70 self-reported HIV-positive people ages 15 years and older who reported that they had ever received HIV medical care from a health care provider. Forty-six (66.3 percent) said it took them less than an hour of travel time, while 16 (22.9 percent) said that it took them one to two hours of travel time. The transport cost ranged from ₦0.00 to ₦3,000.00 with an un-weighted mean of ₦431.14, median of ₦225.00, and mode of ₦200.00.

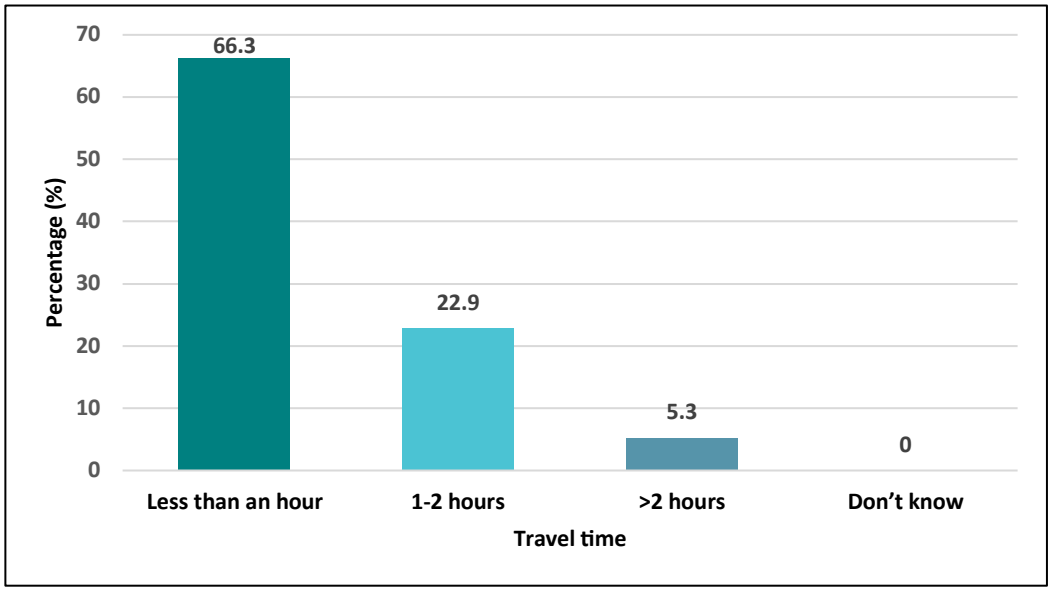
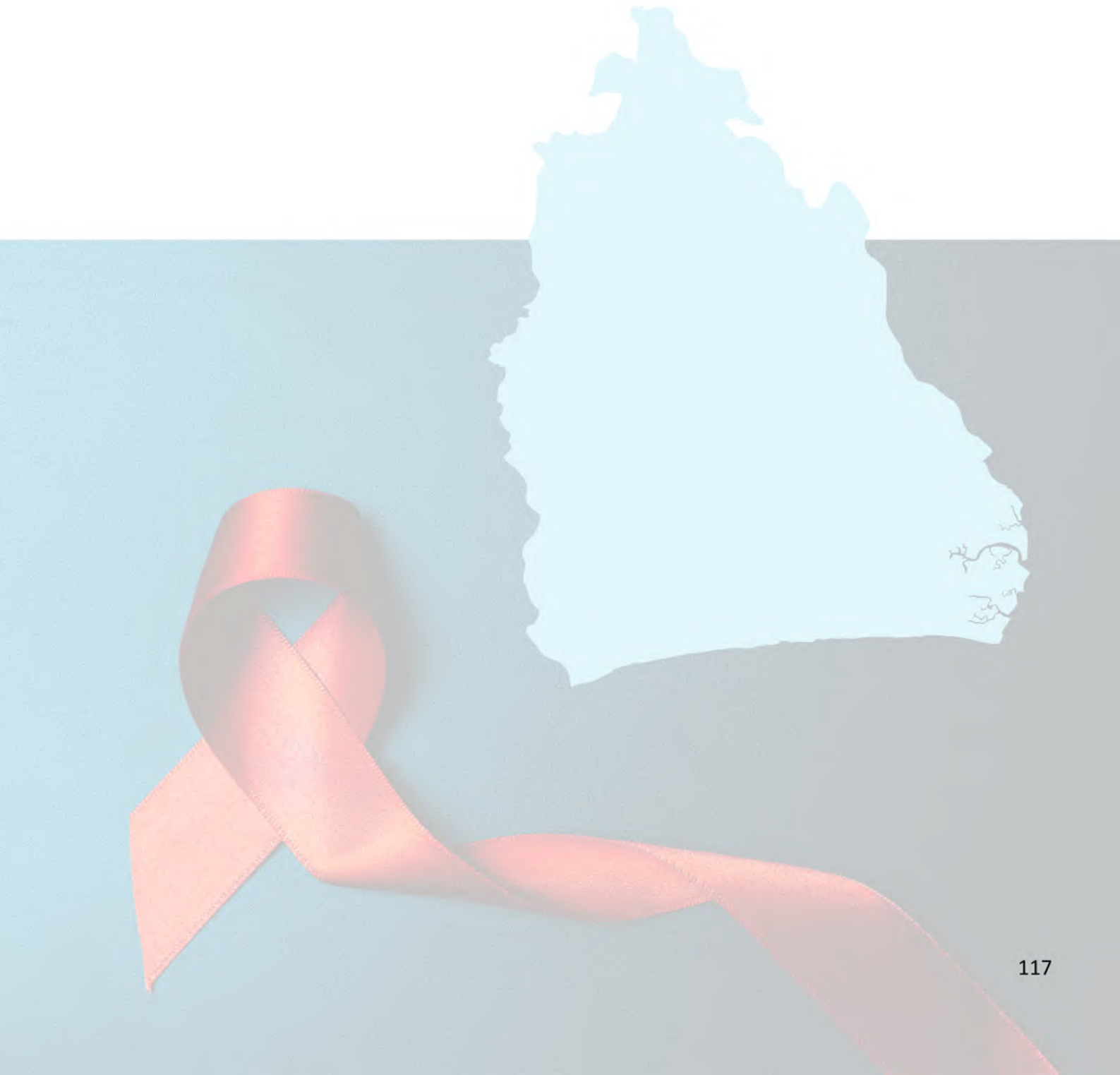


Figure 8-3. Travel time to health facilities among HIV-infected people ages 15 years and older, AKAIS 2017

Chapter 9:

Reproductive Health and PMTCT



CHAPTER NINE
REPRODUCTIVE HEALTH & PMTCT

1,058 women had a pregnancy that resulted in a live birth in the three years preceding the survey

74% attended ANC in pregnancy

65% commenced ANC in second trimester

89% attended ANC in public hospitals/clinics

The most common place of delivery was home **45.5%**

96.4% of those who attended ANC tested for HIV during pregnancy

FAMILY PLANNING METHODS USED

Male Condoms 59 (20.6%)	Injections 92 (31.3%)	Pills 64 (21.2%)
Implant 28 (9.8%)	Rhythm/Natural method 28 (9.4%)	Female Sterilization 8 (2.7%)
IUDs 8 (2.7%)	Withdrawal 87 (13.3%)	Female Condoms 2 (0.5%)

AKAIS 2017

9.1. Antenatal care clinic attendance among women ages 15 years and older

Among 1,058 women surveyed ages 15 years and older who reported live births in the three years preceding the survey, antenatal attendance was 74 percent in their last pregnancy. Of the 784 women who reported attending antenatal clinics, 65 percent reported their first antenatal visit being in the second trimester. The majority of the women (89 percent) received ANC from public hospitals/clinics (Table 9-1).

Table 9-1. ANC attendance among women 15 years and older who reported a live birth in the three years preceding the survey, AKAIS 2017

	Percentage
ANC attendance in pregnancy (n=784)	74.0 percent
Time of onset of ANC	
First trimester	21.7
Second trimester	65.0
Third trimester	13.0
Do not know	0.4
Type of clinic of ANC attendance	
Public hospital/clinic	
Private hospital/clinic	89.0
Faith-based clinic/hospital	9.8
Do not know	1.1
	0.1

9.2. Labor and delivery

Figure 9-1 shows that among 1,058 women who reported live births in the three years preceding the survey, the most common place of delivery was at home (n=485 or 45.5 percent), followed by health facility (n=379 or 36.1 percent). One hundred and forty-three (13.6 percent) delivered in the church, while 51 (4.8 percent) delivered in other places, including the homes of TBAs and healers.

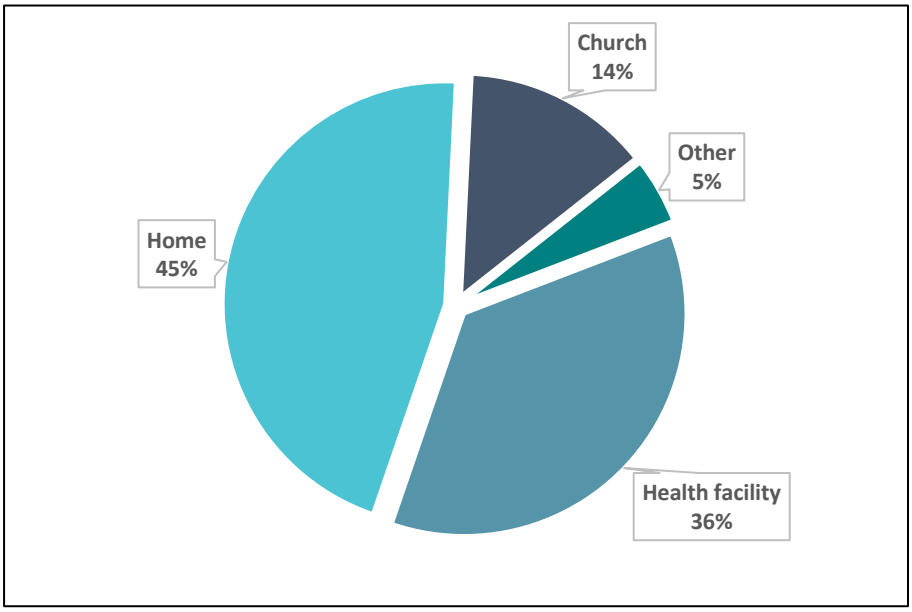


Figure 9-1. Place of delivery among women 15 years and older who reported a live birth in the three years preceding the survey, AKAIS 2017

9.3. HIV counseling and testing in pregnancy

HIV counseling and testing data are reported for the last pregnancies that occurred in the three years preceding the survey. HIV testing was done before pregnancy in 506 (48 percent) of pregnancies reported. Among the 784 women who reported attending ANC during pregnancy, 626 (80.1 percent) were offered HIV testing, out of which 603 (96.4 percent) were actually tested. Of the 379 women who delivered in a health facility, 91 (23.9 percent) were offered HIV testing during labor, of which 76 (84.2 percent) actually tested for HIV (Table 9-2).

Table 9-2. HIV testing in pregnancy among women ages 15 years and older, AKAIS 2017

HIV counseling and testing indicators	n	%
Tested for HIV before pregnancy	1,058	48
Tested HIV positive before pregnancy	506	4.8
Offered HIV tetsing during antenatal clinic visit	784	80.1
Tested for HIV in antenatal clinic during pregnancy	626	96.4
Tested HIV positive during antenatal clinic visit	499	3.7
Offered HIV test during labor	379	23.9
Tested for HIV during labor	91	84.2
Tested HIV positive during labor	76	1.4

9.4. ARV use before, during, and after pregnancy among self- reported HIV-infected women

Access to ARVs before pregnancy, during pregnancy, and in labor was reported among 24, 18, and 1 woman, respectively, who reported HIV-positive test results. Access to ARVs was 41.6 percent before pregnancy and 45.3

percent during breastfeeding. Fifteen out of 18 women who tested HIV positive during pregnancy were given ARVs. The only woman who tested HIV positive during labor had no access to ARVs.

9.5. ARV prophylaxis among HIV-exposed infants

Results of ARV prophylaxis are reported for HIV-exposed infants. Among the 27 women who tested positive for HIV before pregnancy, 11 (40.7 percent) reported that their babies received ARVs for PMTCT. Among the 19 women who tested positive for HIV during pregnancy, 13 reported that their babies received ARVs for PMTCT. The only woman who reported testing positive to HIV during labor reported that her baby did not receive ARVs for PMTCT. Figure 9-2 shows that 41.1 percent of HIV-exposed infants received ARVs for prophylaxis after birth, and 44.1 percent were tested for HIV after birth.

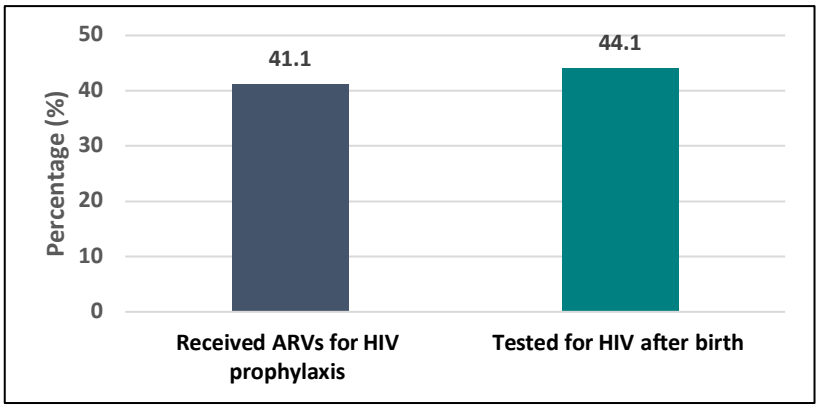


Figure 9-2. HIV prophylaxis and early infant diagnosis among HIV-exposed infants, AKAIS 2017

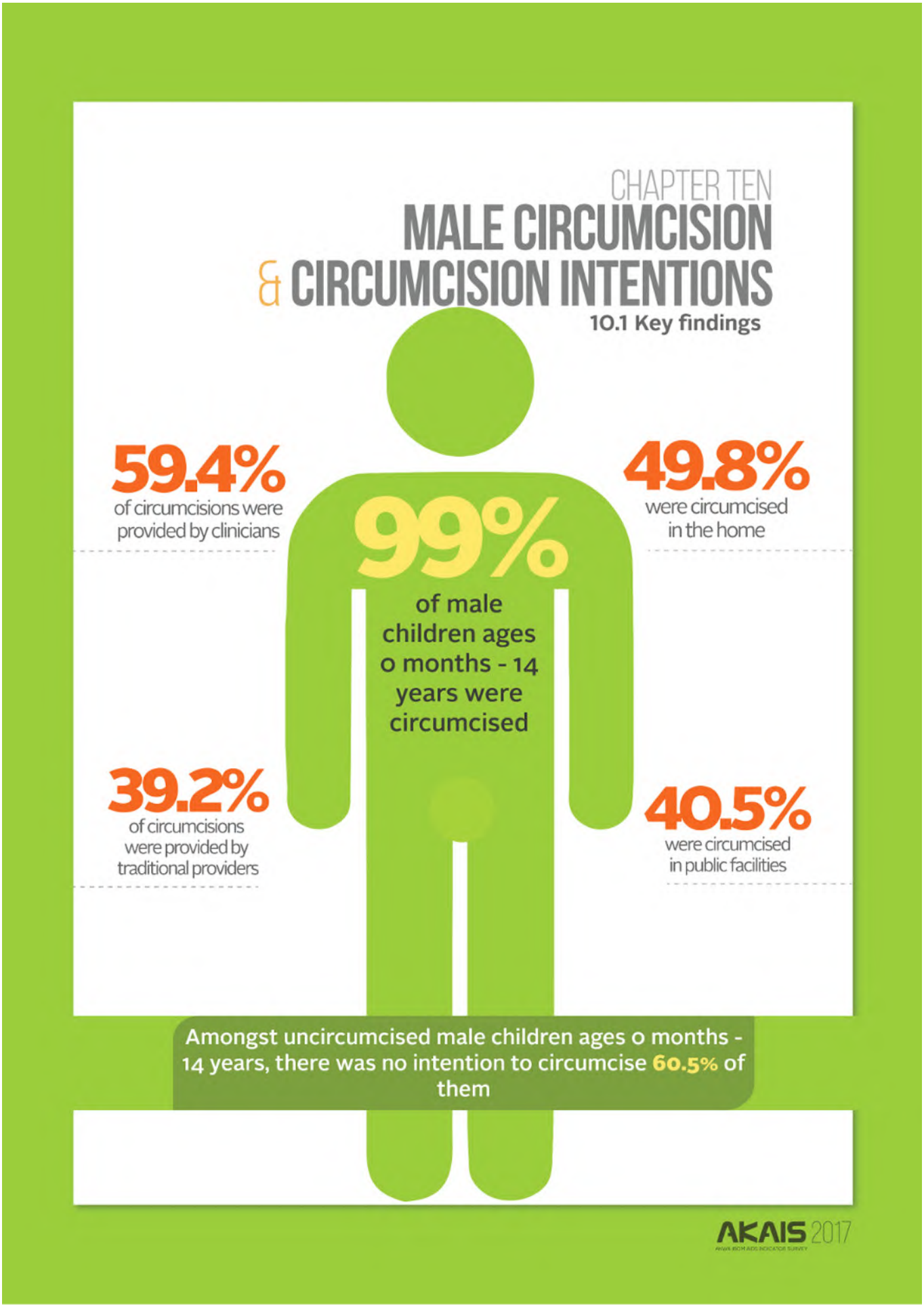
9.6. Family planning and fertility desires of HIV pregnant women

The contraceptive prevalence rate reported by married or cohabitating women ages 15–49 years was 22.4 percent. The methods of family planning reported to be used included male condoms (n=59 or 20.6 percent), injections (n=92 or 31.3 percent), pill (n=64 or 21.2 percent), withdrawal (n=40 or 13.6 percent), implant (n=28 or 9.8 percent), rhythm/natural method (n=28 or 9.4 percent), female sterilization (n=8 or 2.7 percent), female condom (n=2 or 0.5 percent), IUDs (n=8 or 2.7 percent).

Concerning the desire to have another child in the future, 131 (43.6 percent) of those who reported using any form of contraception expressed a desire to have another child in the future. The length of time they would like to wait before birth ranged from 0 to 84 months, with an average of 23.6 months.

Chapter 10:

Male Circumcision and Circumcision Intentions


CHAPTER TEN
MALE CIRCUMCISION
& CIRCUMCISION INTENTIONS
10.1 Key findings
59.4%
of circumcisions were provided by clinicians
49.8%
were circumcised in the home
99%
of male children ages 0 months - 14 years were circumcised
39.2%
of circumcisions were provided by traditional providers
40.5%
were circumcised in public facilities
Amongst uncircumcised male children ages 0 months - 14 years, there was no intention to circumcise 60.5% of them
AKAIS 2017

10.1. Male circumcision status among children ages 0–14 years

The majority of the male children ages 0–14 years whose parents (2,397) responded to the question on circumcision were circumcised (n=2,372 or 99 percent). Most were circumcised at home (n=1,194 or 49.8 percent). Other places of circumcision reported were a public health facility (n=954 or 40.5 percent) and a private health facility (n=201 or 8.7 percent). The most common providers of circumcision of male children and adolescents surveyed were clinicians (n=1,392 or 59.4 percent) followed by traditional practitioners (n=946 or 39.2 percent) (Table 10-1).

Table 10 1. Male circumcision among children and adolescents ages 0 months–14 years

Variables	Percentage
Circumcised males (n=2,372)	99.0
Place of circumcision	
At home	49.8
Public clinic or health facility	40.5
Private clinic or health facility	8.7
Other	1.0
Provider of circumcision	
Traditional practitioner	39.2
Clinician	59.4
Other	1.1
Don't know	0.3
Refused to say	0.1

10.2. Intention to circumcise among uncircumcised male children ages 0–14 years

Intention to circumcise was reported for the 25 uncircumcised male children. Figure 10-1 shows that there were intentions to circumcise nine (34 percent) of the male children and no intentions to circumcise 15 (60.5 percent), while the parent/guardian of one (5.5 percent) child did not know if he would be circumcised in the future or not.

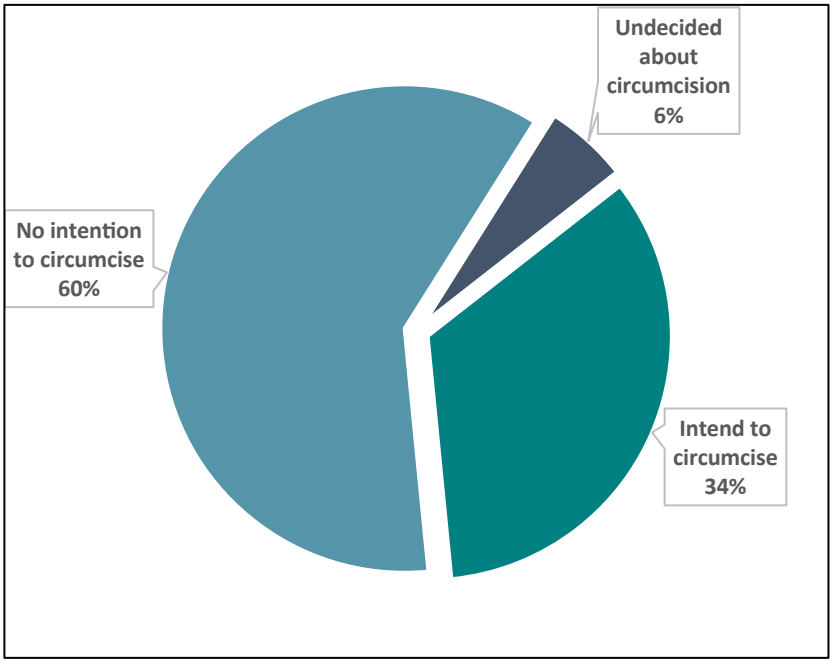
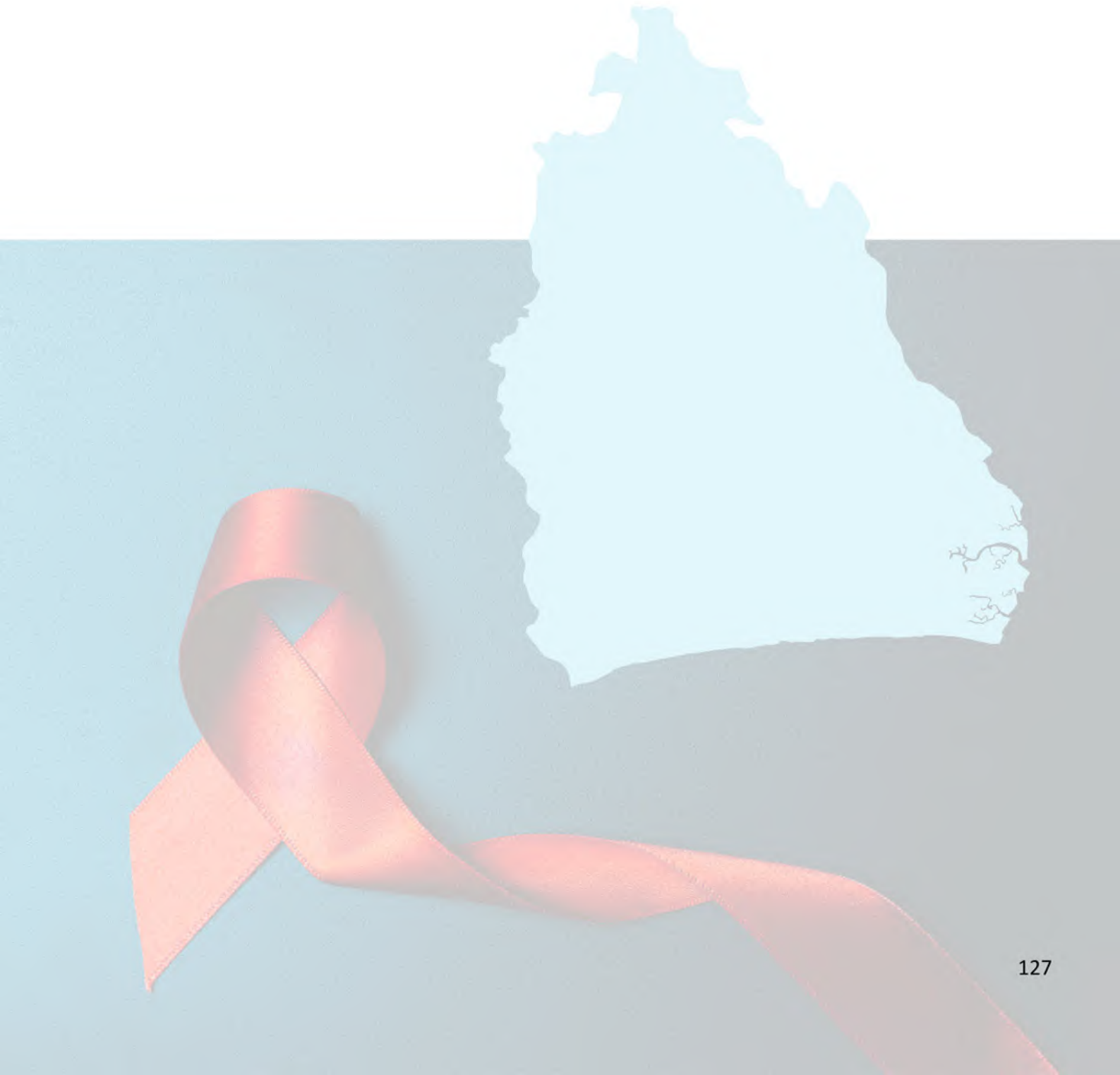


Figure 10-1. Intentions to circumcise male children among uncircumcised children ages 0–14 years, AKAIS 2017

Chapter 11:

Blood and Injection Safety Among People Ages 15 years and older



CHAPTER ELEVEN

BLOOD & INJECTION SAFETY AMONG PEOPLE AGES 15 YEARS AND OLDER

11.1 Key findings

8,932
Adult respondents

4.3%
Blood transfusion rate

4.8%
Blood donation rate

Most blood donations were made in public hospitals on request and voluntarily

35.5% received medical injections in the 12 months prior to the survey

90.4% of these injections were administered by health care workers

AKAIS 2017
AKWA IBOM AIDS INDICATOR SURVEY

11.1. Blood transfusion among people ages 15 years and older

Among the 8,932 adults who responded, 381 (4.3 percent) reported ever having received a blood transfusion.

11.2. Blood donation among HIV-infected and uninfected people ages 15 years and older

Among the 8,932 adults who responded, 419 (4.8 percent) had ever donated blood. Of those who had ever donated blood, 60 (14.1 percent) had donated in the 12 months preceding the survey. Thirty-one (50.7 percent) of those who had donated blood in the 12 months preceding the survey had donated blood voluntarily, while 29 (49.3 percent) had donated blood on request. Most donations were made in public hospitals (n=44 or 72.8 percent) (Table 11-1).

Table 11-1. Medical injection safety among adults and adolescents ages 15 years and older, AKAIS 2017

Variables	Percentage
Donated blood in the 12 months preceding survey (n=60)	14.1
Reason for donating blood the last time	
Family/friends	51.5
Hospital	48.5
Place of last blood donation	
Mobile drive	5.2
Public hospital	72.8
Mission hospital	3.1
Private hospital	17.2
Other	1.7
Blood donation based on request (n=29)	49.3
Source of request for donation	
Family/friends	51.5
Hospital	48.5
Intention to donate blood among ever donors	
Intends to donate blood in future	36.4
No intention to donate blood in the future	54.8
Don’t know	8.7

11.3. Medical injections among people ages 15 years and older

In the 12 months prior to the survey, 3,158 (35.5 percent) of the 8,931 survey participants ages 15 years and older reported that they had received medical injections. In 2,856 (90.4 percent) of these people, the injections were administered by health care workers, while 359 (11.3 percent) reported that they received medical injections by traditional practitioners or healers. Among those who had received a medical injection from a health care worker, 93.4 percent reported that a new, unopened syringe was used (Table 11-2).

Table 11-2. Medical injection safety among adults and adolescents ages 15 years and older, AKAIS 2017

Medical injections and safety	n	Percentage
Received any injection in the 12 months preceding survey	8,931	35.5
Medical injection administered by doctor, nurse or other health worker	3,158	90.4
New syringe used during last medical injection by health worker	2,856	93.4
Medical injection administered by traditional practitioner or healer	3,158	11.3

Chapter 12:

Prevention of Tuberculosis and Cervical Cancer

CHAPTER TWELVE

PREVENTION OF TUBERCULOSIS & CERVICAL CANCER

37% TB detection through passive case finding

91.5% TB treatment coverage among reported cases

74.1% Treatment completion among those who had ever been treated

Cervical cancer testing rate was **0.7%**

Among those tested, **17.5%** reported abnormal results.

AKAIS 2017

12.1. TB diagnosis and treatment among people ages 15 years and older

Of the 8,933 survey participants ages 15 years and older who responded, 2.6 percent had ever visited a clinic for a tuberculosis (TB) diagnosis or treatment. Among the 227 people who had ever visited a clinic for TB diagnosis or treatment, 37 percent reported being diagnosed with TB by a doctor or health worker. Among the 85 people who reported receiving a diagnosis of TB, 91.5 percent were ever treated for TB. At the time of the survey, 14.3 percent of those who reported ever receiving TB treatment were currently on treatment, while 74.1 percent reported that they had completed six months of treatment (Figure 12-1).

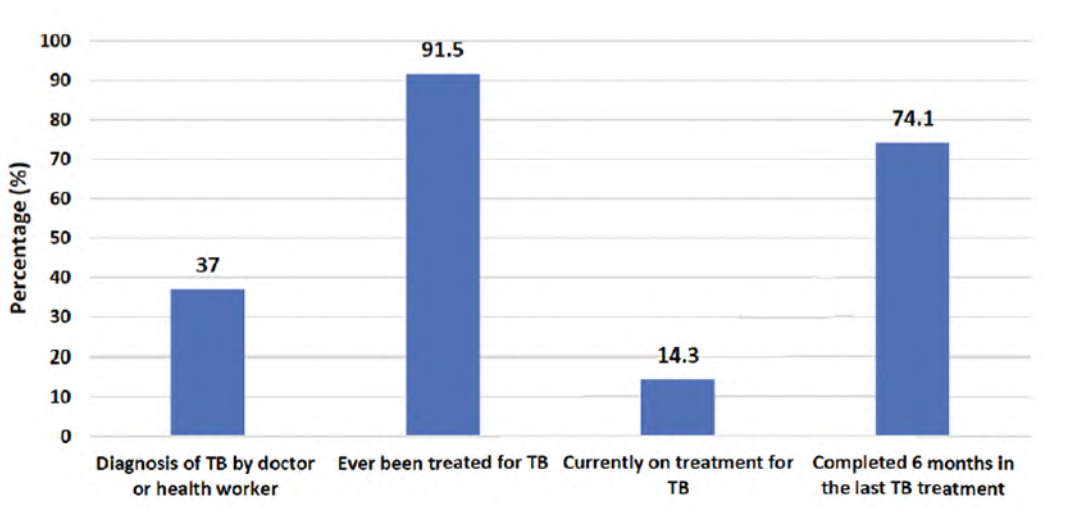


Figure 12-1. TB case finding and treatment among people ages 15 years and older, AKAIS 2017

12.2. Cervical cancer diagnosis and treatment among women ages 15 years and older

Among the 4,912 female respondents ages 15 years and older, only 0.7 percent had ever been tested for cervical cancer, 98.3 percent had never been tested, and 0.9 percent either did not know if they had ever been tested or they refused to answer. Of the 35 people who reported ever testing for cervical cancer, six people (17.1 percent) had an abnormal test result; four received treatment for cervical cancer the same day they were tested, one person received treatment on a different day, and one person was not treated (Table 12-1).

Table 12-1. Cervical cancer testing and treatment among women ages 15 years and older, AKAIS 2017

Variables	Percentage
Ever tested for cervical cancer	
Tested for cervical cancer	
Never tested for cervical cancer	0.7
Don't know/refused to answer	98.3
	0.9
Result of last test	
Normal	76.9
Abnormal	17.1
Don't know	5.6

Chapter 13:

Discussion

Available data on HIV prevalence and demographic, socioeconomic, and behavioral risks factors that drive the HIV epidemic in Akwa state are varied and provide conflicting inferences. The AKAIS affords an opportunity to confirm or refute some of the earlier findings, while also providing additional information on HIV incidence as well as access, coverage, and uptake of HIV care and treatment and related services. These findings will provide up-to-date information for program planners and implementers to make informed decisions about the status and drivers of the epidemic in Akwa Ibom State.

HIV knowledge, risk perceptions, and risk behaviors among adolescents (10–14 years)

The majority of adolescent respondents (10–14 years) had heard of HIV and knew some of the modes of transmission and prevention measures, such as avoidance of sharps, abstinence, and use of condoms. Awareness of HIV was higher in urban areas and among those currently in school. It increased with age and level of education. As expected, awareness of HIV was higher among those who were currently in school or were educated, as schools/teachers were identified as the most common source of HIV knowledge in this age group.

Among adolescents 12–14 years who said they had heard of HIV, 74.9 percent did not perceive themselves as at risk of HIV infection, while 18 percent did not know their likelihood of getting infected. Even among adolescents who had ever had sex, 64.1 percent said they were unlikely to have HIV, while 22 percent did not know their likelihood of getting HIV.

HIV knowledge, risk perceptions, and risk behaviors among adults (15 years and older)

Only 29.1 percent of respondents ages 15 years and older had comprehensive knowledge about HIV transmission. Knowledge was higher in urban areas and increased with levels of education. The majority (58 percent) of adults ages 15 years and older did not perceive themselves to be at risk of HIV. The perception of no risk was higher in urban areas and among female respondents, those with no schooling, and those who had no education.

With the low level of knowledge about HIV transmission, it was expected that among this age group (15 years and older), people living in rural areas, females, those with no schooling, and those with low levels of education would constitute the higher proportions of people with poor attitudes toward PLHIV. Consequently, it is apparent that the low level of comprehensive HIV knowledge predisposes these individuals to having low HIV risk perceptions and the tendency to stigmatize PLHIV. These factors — low HIV risk perceptions, low level of comprehensive HIV knowledge, and HIV- and AIDS-related stigmatization and discrimination — fuel new HIV infections.[17] Findings from this survey with respect to knowledge of HIV and AIDS among people ages 15 years and older were similar to findings from the NDHS 2013 and NARHS Plus 2012 surveys. Nuanced differences observed when the knowledge of HIV prevention methods (i.e., using condoms and limiting sexual intercourse to one uninfected partner) are disaggregated by gender show that the knowledge level from AKAIS was slightly higher.

HIV testing, stigma, and disclosure amongst adults (15 years and older)

Less than half of respondents ages 15 years and older had ever tested for HIV. Over 90 percent of those who had ever tested were negative. Of those who tested positive, HIV infection rates were higher in females and urban residents, increased with age, and decreased as educational levels increased.

Despite the limited reported coverage for HIV testing, even among those ever testing positive, 37.8 percent did not disclose their HIV-positive status to anyone. Fear of stigma was recognized as one of the major reasons why people were reluctant to test for HIV. Low knowledge of HIV status coupled with lack of disclosure may therefore fuel the continuing spread of HIV. To ensure the success of HIV prevention efforts, programs must be designed to address stigma.

Sexual behavior among adolescents 12–14 years

With regards to sexual exposure and demographic characteristics of adolescents who reported being pressured by friends to have sex, as well as by those who reported the ability to refuse sexual advancements, older adolescents reported more peer pressure to have sex than younger adolescents. A greater proportion of 13-year-olds reported the ability to refuse sex than the 12- and 14-year-olds. In respondents ages 12–14 years who reported that they had ever had sex, we observed a greater proportion of adolescents in rural areas (24.3 percent) than urban areas (17.4 percent). More females (23.4 percent) than males (20.6 percent) reported ever having sex. Exposure to sexual intercourse increased with age.

Sexual behavior among people 15 years and older

A total of 8,926 people ages 15 years and older responded to the question on ever having had sex. Over 90 percent of these adults had ever had sex. This proportion was higher among females than males. Furthermore, of the people ages 15 years and older who had ever had sex, about 99 percent said that they had ever had vaginal sex, and 1.8 percent said that they had ever had anal sex. HIV prevalence was higher (4.9 percent) among those who had ever had sex compared to those who had never had sex (0.6 percent). Prevalence among those who had ever had vaginal sex was 5 percent, while those who had ever had anal sex had a prevalence of 3.9 percent.

Use of alcohol and performance-enhancing drugs among 15 years and older

About 58.8 percent of people ages 15 years and older who were surveyed said they had ever consumed alcohol. With respect to injecting drug use for pleasure, a small percentage (0.4 percent) of the survey participants ages 15 years and older reported ever injecting drugs for pleasure. Indian hemp was the most commonly used (52.8 percent) mood-enhancing drug.

Prevalence of HIV

The overall prevalence of HIV in Akwa Ibom State from this survey was 2.8 percent. The point prevalence of HIV among adults 15 years and older in Akwa Ibom State was 4.8 percent and 0.4 percent among children ages 0–14 years. The prevalence of HIV in children ages 0–9 years and adolescents ages 10–14 years were 0.4 percent and 0.6 percent, respectively. For all age groups, the prevalence was higher in the rural than urban areas. In children ages 0–9 years, HIV prevalence was 0.2 percent in urban areas and 0.4 percent in rural areas. Among adolescents ages 10–14 years, HIV prevalence was 0 percent in urban areas and 0.9 percent in rural areas. The three highest HIV-prevalence values among those 10–14 years were 3.6 percent in Obot Akara, 2.6 percent in Ika, and 2.1 percent in Etim Ekpo LGAs. A total of 8,306 people ages 15 years and older were tested for HIV in Akwa Ibom State. In adults, HIV prevalence was about 5 percent in rural areas, compared to about 4 percent in urban areas in this age group.

Overall, prevalence was higher among those who had had any form of schooling compared to those who had had no schooling. The highest prevalence was seen among those who had had only primary education. The HIV prevalence was significantly higher in females (5.6 percent) than males (3.7 percent) ages 15 years and older. Prevalence was highest among those previously married (7 percent).

The HIV prevalence of Akwa Ibom is 2.8 percent. This finding mirrors trends observed in the HIV positivity rate from facility-based testing data in Akwa Ibom State. The HIV positivity rate showed a significant decline from 12.3 percent in 2013 to 2.8 percent in 2016. Similar studies done in the state, such as the 2014 ANC (sentinel) survey and the NARHS 2012, showed HIV prevalence rates of 10.8 percent and 6.5 percent, respectively.

However, it is noteworthy that these surveys had different methodologies and sample populations. A trend analysis of rural-urban prevalence in Akwa Ibom from ANC sentinel surveys show that rural HIV prevalence has consistently been higher than urban prevalence, including the as shown in the 2014 ANC survey where urban prevalence declined but rural prevalence continued to rise. Findings in this survey where rural prevalence was found to be higher support this previous trend. Gender distribution previously documented from national HIV surveys is similar, with female HIV prevalence being higher than male.

Laboratory-based HIV incidence

HIV incidence measures new HIV infections in a population over time (e.g., infection of 100 persons per year). Incidence data reveal trends in the HIV epidemic, the rate at which HIV is spreading, and the effectiveness of HIV prevention. This measurement helps to identify populations at unusually high risk for HIV infection.[45]

HIV incidence assays are designed to measure specific biomarker(s) that distinguish recent from established or long-term infection. The most widely evaluated methods have involved the measurement of serologic responses to HIV, mainly HIV antibody titre or antibody avidity.[43 46]

The new Limiting antigen assay method was used in the laboratory to estimate HIV incidence from the cross-sectional sample of confirmed HIV-1-positive individuals using the RITA. Incidence estimates obtained from Sedia plasma LAg-Avidity EIA after exclusion of individuals with low viral load (<1000 copies/ml) was 0.41/100 PY. Very little information is currently available on the use of DBS for cross-sectional incidence testing.[32 47] This study included the DBS sample comparison with its corresponding plasma specimen because of the beneficial effect of DBS in sample collection, handling, and transporting to inform future use of DBS in Nigeria for population-based studies. We decided to compare the results of DBS and similar plasma samples in the survey for correlation between the sample type and to further investigate the use of DBS samples to screen populations for HIV incidence. Thus, in comparison to the Sedia plasma LAg-Avidity EIA, DBS incidence was twice as much as the plasma (0.41/100 PY vs. 0.85 /100 PY). The majority of plasma samples were found to correlate with the DBS samples; however, DBS samples were classified as recent twice as much as the plasma samples, suggesting that using DBS may result in overestimation of HIV incidence. This result agrees with another study comparing DBS with plasma in a laboratory-based HIV incidence assay by a multi-country consortium.[48] There is therefore a need to review the DBS protocol or use a more optimized LAg assay kit for DBS samples. Based on the latest recalibration of the LAg-Avidity EIA in different HIV-1 subtypes, the LAg assay had been known to perform well on the Maxim Biomedical, Inc., Rockville, MD, USA kit using DBS specimens, which is an important advantage in large population-based surveys.[49]

Bio-Rad was incorporated into the study to minimize misclassification of people who may have been recently reported for the LAg-Avidity assay for advanced AIDS progression, elite controllers, and those on ART with viral suppression and partial seroreversion following ART and viral subtypes. Cross-sectional surveys based on a single serologic assay often overestimate HIV incidence. Multi-assay algorithms (MAAs) are said to provide more accurate discrimination between recent and non-recent infection at the population level.[50 51 52] Use of Bio-Rad Avidity had been suggested for use in MMAs in combination with LAg-Avidity.[53] Samples misclassified by the Bio-Rad assay had been reported to coincide less with those of the LAg assay. Bio-Rad Avidity was best at identifying truly recent infections with an FRR similar to the LAg-Avidity.[43] For simplicity and comparison in this study, we analyzed the same samples using the Bio-Rad and Sedia kits. Twenty-two were found to be final recent, which was twice as much as the Sedia plasma LAg assay. Following application of the mean duration of 333 days specified by the CEPHIA project,[54] the incidence was observed to be 0.32/100 PY.

The HIV incidence findings for this survey were based on reports of the Sedia plasma avidity assay. The results showed a 0.41 percent annual incidence of HIV among adults ages 15 years and older, representing a total of 13,000 new infections in this age group. Incidence was 0.42 percent among males and 0.41 percent among females. The number of new infections was 1.2 times higher in males than in females. The new infections in the age group 15–19 years was higher than in other age groups; this age group accounts for nearly half of the new HIV infections (5,000) occurring in the population ages 15 years and older. This is of concern where the growing population of adults ages 15–19 years are getting infected with the HIV virus and calls for revised HIV programming to be more focused on this age group. These data also corroborate the assertion that HIV is an epidemic primarily of young people and the need to reach this new generation of young people with HIV prevention and treatment services.[55 56 57 58]

HIV Incidence among those cohabitating with their sexual partners was higher (1.60 percent) compared to married (0.42 percent), never married (0.42 percent), and previously married respondents (0.22 percent). There is a need to strengthen the pre-exposure prophylaxis (PrEP) interventions in the country so that those who are living with discordant sexual partners can have prevention interventions as part of package of care. Incidence among those who had ever had sex was observed to be 0.46 percent and zero in those who had never had sex. This attests to the fact that characteristics of HIV epidemics vary, and in African countries HIV is acquired primarily through heterosexual contact and from mother to child. Although key populations contribute to the spread of HIV, heterosexual sex, particularly of low-risk sex, was reported to make up about 80 percent of HIV transmission in Nigeria. Mother-to-child transmission and transfusion of infected blood and blood products, on the other hand, accounted for the other notable modes of transmission.[59]

Rural areas had higher HIV incidence rates compared to urban areas (0.43 percent vs. 0.37 percent). This was in line with the population demographics of Akwa Ibom State, where the majority of the populace are rural dwellers. It also highlights the need for HIV programming to be more focused on rural areas.

With the current incidence estimates from this survey, especially among young people, the propensity for HIV transmission remains high in Akwa Ibom State. It also shows that the adults ages 15–19 years are not being reached as expected. This is an indication of the need to urgently reach the younger generation with HIV prevention and treatment services, especially in the rural areas. More research is needed to better understand the factors that are driving HIV transmission among adults ages 15–19 years in Akwa Ibom State.

HIV testing among children 0–14 years

Overall, 14.2 percent of children ages 0–14 years were reported to have ever tested for HIV, with higher rates in urban than rural areas. Testing rates were higher in Okobo (37.4 percent), Oron (35.2 percent), Ikot Ekpene (33.6 percent), and Uruan (30.1 percent) LGAs, while the lowest rates were in Esit Eket (2 percent), Mbo (2.6 percent), and Ini (2.9 percent) LGAs. The three LGAs with the highest testing rates in the age group 0-14 years are among the PEPFAR scale up LGAs in the state with intensified drive for epidemic control in the two years preceding the survey. On the other hand, the LGAs with the lowest reported proportions of children ever tested correspond to three of PEPFAR's sustained support in low HIV burden LGAs. These findings substantiate PEPFAR's achievements in increasing access to HTS in these LGAs. Of these, 675 children 0–14 years were reported as ever having been tested for HIV prior to the survey, three of whom (0.4 percent) were reported to have tested positive for HIV. This HIV positivity rate of 0.4 percent as analyzed using the self-reported data in this survey corresponds to the same prevalence of 0.4 percent found among this age group in AKAIS.

HIV testing among people ages 15 years and older

Among the 8,933 people ages 15 years and older who responded to the questions on HIV testing, 47 percent reported they had ever been tested for HIV. The testing rate was higher among females (48.4 percent) than males (45.4 percent), higher in those who had had any form of schooling (49.4 percent) compared to those who had not (24.8 percent), higher in urban areas (57.7 percent) than rural areas (42.1 percent), and increased with level of education (no education 25.3 percent, primary 38.0 percent, secondary 47.2 percent, and tertiary 81.8 percent). Our finding of higher testing rates among females, urban residents, and people with higher levels of education are consistent with findings from the 2013 NDHS[17] and NARHS Plus 2012.[6]

The highest testing rates for adults 15 years and older were reported in Okobo (83.5 percent), Uruan (75.3 percent), Oron (70.4 percent), Uyo (67.8 percent), and Ikot Ekpene (67.6 percent), while the lowest testing rates were reported in Ini (26.9 percent), Oruk Anam (27.4 percent), and Obot Akara (29.9 percent). Again, Okobo, Oron, Uyo, and Ikot Ekpene are among PEPFAR's scale-up LGAs in Akwa Ibom State, further corroborating our assertion that PEPFAR has had demonstrable success in increasing HTS access in these LGAs. Similarly, the three LGAs reporting the lowest testing rates are PEPFAR's sustained-support LGAs. Uruan LGA features as one of the LGAs with the highest ever-tested rates for both children and adult populations, while Ini features as one of the LGAs with the lowest ever-tested rates among both age groups.

HIV care and treatment coverage of HIV-infected adults and adolescents ages 15 years and older (enrollment in care, access and coverage of ART and co-trimoxazole, ART adherence, and viral load suppression)

Most (78.1 percent) of the adults ages 15 years and older who self-reported a positive HIV test result said that they had ever received care from a health care provider. This was higher among females and urban residents. Of the self-reported HIV-positive respondents, 95.3 percent reported ever receiving ARVs, and 81.1 percent of these were currently taking ARVs. Access to ARVs (i.e., currently on ARVs) was higher among females (83.1 percent) compared to their male (74 percent) counterparts. Coverage of ARVs was marginally higher in urban areas (81.9 percent) than in rural areas (80.1 percent). Less than half (45.9 percent) of self-reported HIV-positive respondents on ART had ever had viral load testing. Coverage of viral load testing was higher in rural areas. Barely, 16.5 percent of these respondents had ever attended support group meetings. This is much lower than findings from a facility-based study among 1,676 PLHIV enrolled in ART sites supported by the SIDHAS project in Nigeria, which found that 47 percent of respondents had ever participated in support group activities.[60]

Travel time and transport costs to health facilities among HIV-infected adults 15 years and older

The majority of respondents ages 15 years and older who self-reported that they had ever received HIV medical care from a health care provider had less than two hours of travel time to the facility. The median travel cost was N225.00. A small proportion reported traveling more than two hours to receive HIV care. Time spent receiving care influences retention in care and is useful in planning treatment sites in settings like Akwa Ibom with hard-to-reach areas. Total direct and indirect costs of care such

as lost productivity due to the time spent on clinic visits increase the economic burden of PLHIV, and service decentralization is key to improving equitable access for HIV services.

Antenatal care clinic attendance among women ages 15 years and older

The majority (74.0 percent) of the 1,058 female respondents ages 15 years and older who reported live births in the three years preceding the survey attended antenatal clinics during their last pregnancy. This ANC attendance rate was higher than that reported in the NARHS Plus 2012; where 65 percent of all the female respondents and 69.4 percent of those in South-South, Nigeria reported attending ANC visits in the five years preceding the survey.[6] The rate was also higher than that reported among female respondents in the NDHS 2013 (61 percent).[17]

Most (89 percent) of the ANC attendance were in public hospitals or clinics. And most (65 percent) of the women reported their first ANC visit during the second trimester of pregnancy. Improved ANC attendance was observed for AKAIS, and this plus the preference for public health facilities for ANC underscores the need for the public facilities to be upgraded to provide high-quality services. It is also imperative that the public facilities are supported to provide PMTCT services in order to expand coverage in Akwa Ibom State.

Labor and delivery

Most births (63.9 percent) among respondents were not attended by skilled attendants. The most common place of delivery was at home, though most women registered and attended ANC in health facilities. About 45.5 percent of the women who reported live births in the three years preceding the survey delivered at home, 36.1 percent in the health facilities and 13.6 percent in churches. This was similar to the findings of the NDHS 2013, where the most common place of delivery for respondents (55.9 percent) from Akwa Ibom State was at home.[17] This was different in the NARHS Plus 2012, where the most common place of delivery was government health facilities followed by at home.[6] The preference for home delivery further underscores the need to maximize the opportunities afforded by ANC for identifying HIV-positive pregnant women and initiating treatment. Results from this survey support previous findings that show that home and TBA delivery were preferred. The cultural drivers of home delivery by TBAs, as opposed to delivery in health facilities, may explain why women who attend ANC visits may not necessarily deliver in the health facility. We posit that home and TBAs were the preferred choice for delivery, possibly because they are more physically and financially accessible. Programs should also explore ways to expand ANC/PMTCT services into the community to provide access to women who do not attend ANC.

HIV counseling and testing in pregnancy

HTS was offered to the majority of the women during ANC, but only a few were offered this service during labor. Most of the women offered HTS during ANC and labor eventually got tested. HIV testing before pregnancy was reported for 48 percent of women whose last pregnancies occurred in the three years preceding the survey. The majority (80.1 percent) of those who attended ANC were offered HIV counseling and testing. This was comparable to the findings of the NARHS Plus 2012, where it was reported that 84.9 percent of ANC attendees in South-South Nigeria were offered HTS.[6] Of the AKAIS

respondents who were offered HTS during ANC, 96.4 percent had gotten tested for HIV during pregnancy. This was higher than the result of the NDHS 2013, where only 51 percent of the respondents received HIV counseling during ANC and 30 percent of these subsequently tested and received results for HIV.[17] This survey showed a remarkable improvement in testing uptake in that the majority of women receiving ANC who were offered HIV testing actually getting tested, compared to the NDHS 2013 and MICS 2011, which showed that about half of the women who were offered testing actually did get tested.

Only a few (23.9 percent) of the women who delivered in the hospital were offered HCT during labor, with 84.2 percent of these women then getting tested for HIV during labor. These findings suggest that ANC presents the best opportunity to offer HTS to pregnant women. However, low HTS coverage in labor creates a lingering gap for reaching women who may not have accessed ANC services or for identifying those with latent HIV infection who may have seroconverted during pregnancy. The 2016 National Guidelines for HIV Prevention, Treatment, and Care emphasize retesting in late pregnancy of women who tested negative in early pregnancy.[61]

ARV use before, during, and after pregnancy among self-reported HIV-infected women

Self-reported HIV positivity before pregnancy, during pregnancy, and during labor was relatively low among the female respondents. However, the majority of the women who reported being HIV positive also reported receiving ART. A few (4.8 percent) of the women who had tested for HIV before pregnancy reported being HIV positive, of whom 41.6 percent had received ART. The HIV positivity rate was also low (6 percent) among female respondents who had had a live birth during the five years preceding the NARHS Plus 2012;[6] this was relatively higher than the rate reported in AKAIS. About 3.7 percent of the women who reported testing for HIV during pregnancy were HIV positive, the majority of whom reported being on ART. Only one of those who reported testing for HIV during labor was positive and reported being on ART.

ARV prophylaxis among HIV-exposed infants

Less than half (40.7 percent) of the babies of mothers who tested HIV positive prior to pregnancy were reported to be on ARVs for PMTCT. The majority of the babies of mothers who tested positive during pregnancy and labor were reported to have received ARVs for PMTCT. Similar to ART coverage for women, ART coverage for HIV exposed infants (HIE) was low among women diagnosed before pregnancy. Programs should explore strategies to increase access to ART for women and their infants outside of pregnancy.

Family planning and fertility desires of women

Appropriate use of family planning methods reduces maternal mortality and increases child survival. The most common family planning methods used by respondents were male condoms, injections, and pills. The least used methods were IUDs, female condoms, and male sterilization. This was comparable to the findings of the NARHS Plus 2012, where the most common methods used by respondents from South-South, Nigeria were male condoms, abstinence, injectables, and pills.[6] Less than half (43.6 percent) of those who reported using any form of contraception expressed the desire to have more

children in the future. The average length of time they were willing to wait before the next child was 23.6 months.

Male circumcision status among children ages 0 months–14 years

The majority of the male children and adolescents were circumcised. The most common places for circumcision were at home and at public health facilities. Most of the male children had been circumcised by clinicians. As indicated by the NDHS 2012, population coverage for male circumcision was high in South-South, Nigeria and among the Ibibios, the predominant tribe in Akwa Ibom State.[17]

Intention to circumcise among uncircumcised male children

Of those who were not circumcised, the majority (60.5 percent) did not have the intention to be circumcised. Efforts should be expended to reach out to pockets of males who remain uncircumcised, as this has been found to be associated with increased risk of transmitting STIs including HIV.[62]

Blood transfusions and blood donation among people ages 15 years and older

The blood transfusion rate was low (4.3 percent) among the 8,932 adult respondents. The blood donation rate was also low (4.8 percent), with only a few respondents (14.1 percent) donating during the 12 months preceding the survey. A little more than half (50.7 percent) of those who had donated during the 12 months preceding the survey donated voluntarily, while the others had donated upon request. More than half of the requests for blood donation were from family and friends. The majority (72.8 percent) of the blood donations were done in public health facilities. More than half of those who had ever donated blood did not have the intention to donate again in the future. Voluntary blood donation has been reported to be low even among health workers in Nigeria as a whole,[63] [64] [65] which is corroborated by the findings from the AKAIS. Public awareness-raising efforts should be directed at encouraging people to become voluntary blood donors as opposed to remunerated or family replacement donors, as this is associated with less risk of transfusion-transmissible infections, including HIV.[66]

Medical injections among people ages 15 years and older

The safety practices for medical injections were good, as the majority of respondents reported that injections were administered using new syringes and needles by health workers. This finding demonstrates some measure of success in prevention programs in Akwa Ibom State.

TB diagnosis and treatment among people ages 15 years and older

TB case detection through passive case finding was relatively low. Self-reported TB treatment coverage among reported cases and treatment completion among those who had ever been treated were high. TB case detection efforts should be intensified.

Cervical cancer screening in women ages 15 years and older

The cervical cancer screening rate was very low (0.7 percent) among female respondents 15 years and older. Of those who had screened for cervical cancer, the majority (76.9 percent) had had normal test results. Even though majority of women screened for cervical cancer indicated normal results, low screening rates demonstrate gaps in service coverage. Cervical cancer screening awareness should be created for women of childbearing age across the state.

Limitations

The AKAIS was a cross-sectional survey as opposed to a prospective cohort study, which is the gold standard for HIV incidence estimations.[67 68]

All serology-based HIV incidence assays are subject to some degree of misclassification, typically because of innate immune variation, differences in HIV-1 subtypes, and prolonged use of ART.[69] There is limited knowledge of the dynamics of HIV incidence assay performance in the presence of ART and whether viral suppression alone is responsible for increased FRRs.

The sample size for the incidence testing was small, and there was no baseline FRR available for the country; this could also influence the incidence estimates for the study. There is a need to establish a baseline FRR for the country for future studies.

The MDRI of infection for the Bio-Rad assay was based on the CEPHIA publication. Related values for non-B subtypes of African origin are yet to be published.

Conclusions

- The study provides the first overall prevalence values accounting for all age groups as well as incidence of HIV in Akwa Ibom State; it is also the first study of its kind in the whole of Nigeria. The risk factors for HIV infection and the continuing burden of the disease in the state are now better understood, and the study results should be used to improve programming and budgeting for HIV control in Akwa Ibom State.

- HIV is still a major contributor to the burden of disease in Akwa Ibom State and is particularly devastating because it affects the productive population. This is because, despite the overall prevalence of HIV, which is 2.8 percent among the general population in the state, the point prevalence among people ages 15 years and above was 4.8 percent. This group represents the sexually active age group responsible for heterogeneous transmission of HIV. The burden of the disease is continually increasing in the state on a yearly basis, with at least 13,000 new cases of HIV infection occurring annually in people 15 years and older. Again, young people ages 15–19 years have the highest new infection rates in the state.

- The overall prevalence of HIV in Akwa Ibom State as assessed by the survey was 2.8 percent, and the prevalence of HIV in children ages 0–14 years was 0.4 percent. For this age group, prevalence was higher in rural than urban areas.

- Although the point prevalence of HIV among people ages 15 years and older in Akwa Ibom State was 4.8 percent, higher prevalence rates were observed in all other adult age groups except the age groups 15–19 years, 20–24 years, and 50 years and older.

- The annual incidence of HIV among adults ages 15 years and older was 0.41 percent. The HIV incidence rates were similar in females and males (0.41 percent among females and 0.42 percent among males). This translate to 13,000 new cases of HIV infections annually in persons 15 years and older.

- The HIV burden in the state could be fueled by the finding that HIV risk perceptions were very low among all age groups in the state; however, people 15 years and older perceived themselves as being at higher risk than did their younger counterparts. The HIV burden is also fueled by suboptimal HIV control services and the absence of universal coverage with such services.

- Knowledge of and attitudes toward HIV among school-age children, especially those who were not in school, is also a problem that should be addressed in order to reduce the burden of HIV in the state. This is because a higher proportion of out-of-school adolescents ages 12–14 years (41.9 percent) reported ever having sex compared to in-school adolescents (21 percent).

- There is a low level of testing for HIV in the state, which is vital for understanding the scale of the problem and for early initiation of HIV-positive people into care and treatment.

- There is a moderate level of access to ART; however, universal coverage of HIV control services in the state is yet to be attained.

- The evidence base has now better elucidated the enabling and constraining factors for the optimal prevention and treatment of the disease.

- Resources must be mobilized from both local and international sources to ensure universal access to HIV prevention and treatment services in the state, with extra attention paid to the more at-risk population groups.

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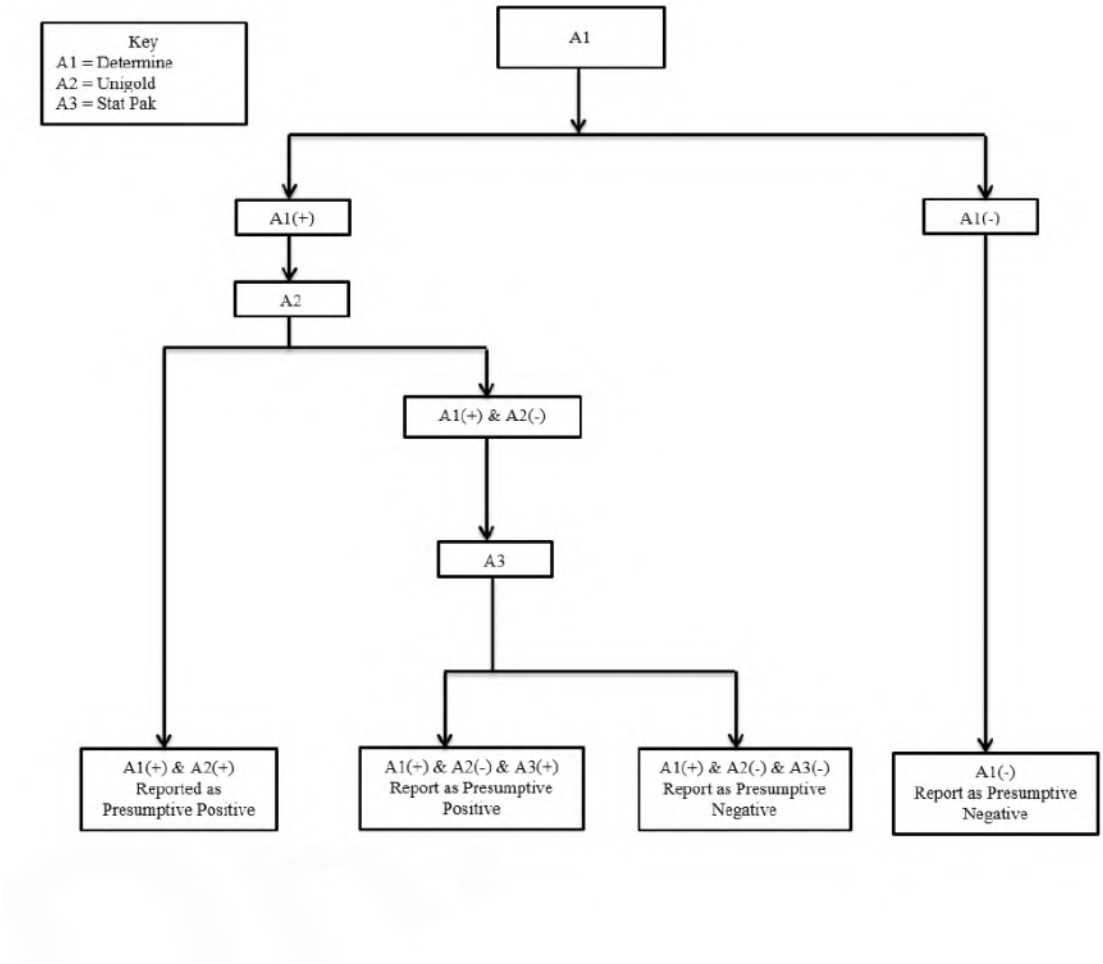
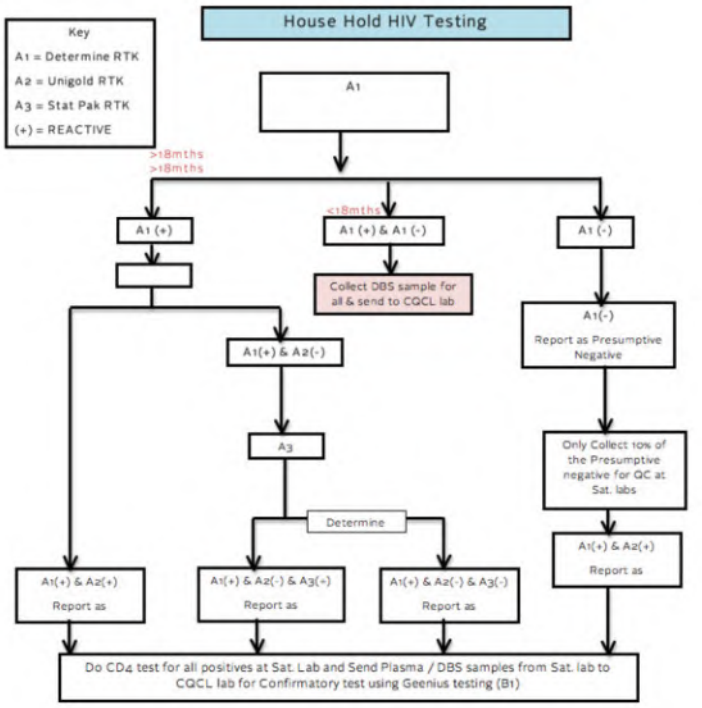
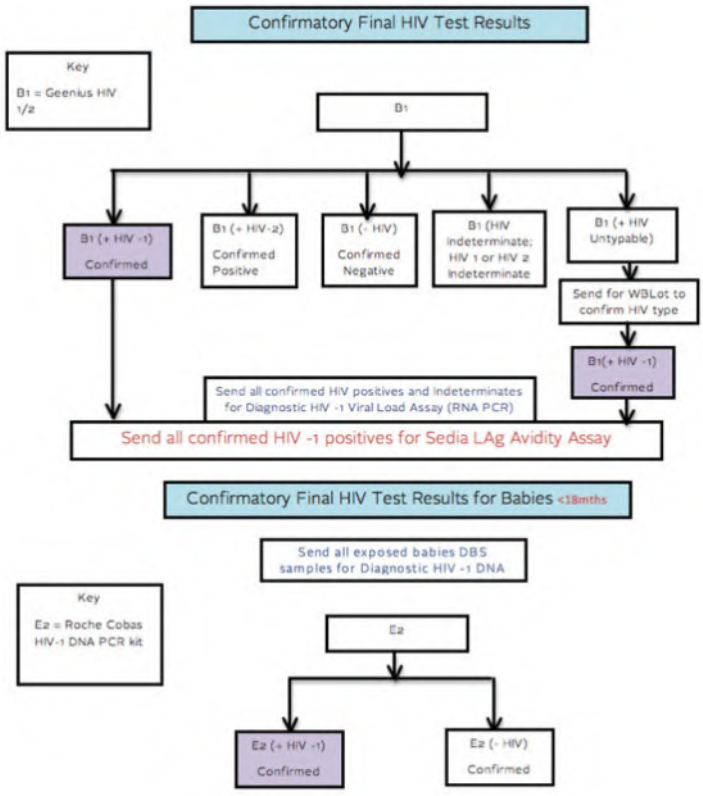
Appendices

Appendix A: National HIV testing algorithm



Appendix B: National HIV testing Algorithm from the field





Appendix C: Sampling probabilities and sampling weights

Sampling probabilities were calculated separately for each sampling stage and for each cluster (EA). The following notation was used for calculation of sampling weight:

n_h number of EAs selected from stratum h;
N_h number of EAs present in stratum h;
L_{hi} number of households counted during the household listing operation in stratum h and EA i
g_{hi} number of households selected from the ith EA of stratum h.

The (first-stage) probability of selecting EA i in stratum h is given by

$$P_{1hi} = \frac{n_h}{N_h}.$$

The (second stage) probability of selection of households in EA i of stratum h is given by

$$P_{2hi} = \frac{g_{hi}}{L_{hi}}.$$

Then the overall selection probability of each household in EA i of stratum h is therefore t

$$P_{hi} = P_{1hi} \times P_{2hi}.$$

The **design weight** W_{hi} for each household in cluster i of stratum h is the inverse of its selection probability given by

$$W_{hi} = 1/P_{hi}.$$

The cluster-level response rate in stratum h is given by

$$R_{Ch} = n_h^*/n_h$$

where n_h^* is the number of EAs which were actually sampled. The household response rate in stratum h is given by

$$R_{Hh} = \frac{\sum_i W_{hi} m_{hi}^*}{\sum_i W_{hi}\, m_{hi}}$$

where m_{hi}^* is the number of households interviewed and m_{hi} is the number of households found in EA i of stratum h. The household sampling weight—***adjusted for non-response***—is given by

$$W_{Hhi} = \frac{W_{hi}}{R_{Ch} \times R_{Hh}}.$$

The individual response rate from stratum h is given by

$$R_{Ph} = \frac{\sum_i W_{hi} k_{hi}^*}{\sum_i W_{hi}\, k_{hi}}$$

where k_{hi}^* is the number of eligible persons who contributed blood samples, and k_{hi} is the number of eligible persons who where found in EA i of stratum h. The individual sampling weight —*adjusted for non-response*—is given by

$$W_{Phi} = \frac{W_{Hhi}}{R_{Ph}}$$

Appendix D: Additional tables

Basic amenities and household construction

Table D-1. Methods of water purification

Main Method of Water Purification	Urban (n = 1,364) %	Rural (n = 2,949) %	Total (n = 4,313) %
Do not treat water	74.5	88.3	83.9
Boiling	10.2	3.7	5.7
Sedimentation	0.7	4.1	3.0
Disinfection	3.7	0.6	1.6
Sachet water	9.0	1.9	4.2
Other	1.9	1.4	1.5

Table D-2. Main source of cooking fuel

Main Source of Cooking Fuel	Urban (n = 1,364) %	Rural (n = 2,949) %	Total (N = 4,313) %
Firewood/straw	45.4	85.3	72.7
Paraffin/kerosene	38.9	12.1	20.6
Natural gas	14.0	1.8	5.7
Other	1.7	0.8	1.1

Table D-3. Type of toilet facility

Type of Toilet Facility	Urban (n = 1,364) %	Rural (n = 2,949) %	Total (N = 4,313) %
Traditional pit latrine	50.5	81.4	71.6
Flush or pour flush toilet	42.8	9.9	20.3
No facility/bush/field	1.5	6.6	5.0
Ventilated improved pit latrine	4.7	1.6	2.6
Other	0.5	0.5	0.5

Table D-4. Electricity

Electricity	Urban (n = 1,364) %	Rural (n = 2,949) %	Total (N = 4,313) %
Any electricity	89.8	70.8	76.8
Connected to national grid	97.3	87.9	91.3
Generator	61.8	52.5	55.9
Solar power/inverter	1.1	0.4	0.7

Table D-5. Main material on floor

Main Material on Floor	Urban (n = 1,364) %	Rural (n = 2,949) %	Total (N = 4,313) %

Cement	77.4	67.6	70.4
Earth/sand	8.3	28.0	21.7
Ceramic tile	13.8	3.9	7.0
Others (polished wood, vinyl, terrazzo)	0.6	0.5	0.5

Table D-6. Main material of the roof

Main Material of the Roof	Urban (n = 1,364)		Rural (n = 2,949)		Totals (N = 4,313)	
	Frequency	%	Frequency	%	Frequency	%
Corrugated iron	697	51.5	1885	64.4	2582	60.3
Aluminum sheet	572	41.6	671	22.5	1243	28.6
Thatch/palm leaf	38	2.8	308	10.0	346	7.7
Asbestos	45	3.3	48	1.6	93	2.2
Other (mud, concrete, step tiles, wood)	12	0.8	37	1.3	49	1.1

Table D-7. Main material of the external wall

Main Material of the Exterior Walls	Urban (n = 1,364)		Rural (n = 2,949)		Totals (N = 4,313)	
	Frequency	%	Frequency	%	Frequency	%
Cement	996	72.1	1481	49.4	2477	56.6
Cement block	250	19.7	599	21.5	849	20.9
Mud	46	3.3	521	18.2	567	13.5
Bamboo with mud	43	3.1	160	5.2	203	4.5
Other (cane, stone/mud, bricks, stone/cement, wood)	29	1.9	188	5.7	217	4.5

Table D-8. Asset ownership

Asset Ownership	Urban (n =1,364)		Rural (n=2,949)		Total (N=4,313)	
	Frequency	%	Frequency	%	Frequency	%
Radio	982	70.7	1921	65.5	2903	67.1
mobile phone	1233	90.0	2302	78.7	3535	82.3
Refrigerator	668	48.5	527	18.3	1195	27.9
Bicycle	254	18.8	1196	40.0	1450	33.3
Motorcycle	457	33.7	1408	48.3	1865	43.7
Car or truck	258	18.3	205	6.9	463	10.5
Boat or canoe	17	1.4	110	3.8	127	3.0

Table D-9. Ownership of farm animals

Ownership of Farm Animals	Urban (n=1,364)		Rural (n=2,949)		Total (N=4,313)	
	Frequency	%	Frequency	%	Frequency	%

Poultry	420	32.0	1417	48.0	1837	42.9
Goats/sheep	249	18.6	1003	34.2	1252	29.2
Dogs	128	9.2	408	14.3	536	12.6
Cows	4	0.2	11	0.4	15	0.3
Other animals (donkey, horse, camel, etc.)	5	0.4	41	1.4	46	1.1
Ownership of mosquito net	897	66.7	2248	75.7	3145	72.8

HIV care and treatment program coverage

Table D-10. Adults and adolescents ages 15 years and older receiving HIV care from health care worker, AKAIS 2017

Variables	N	%
Ever received HIV medical care from a health care provider	89	78.1
Gender		
Male	23	68.8
Female	66	81.3
Age category		
15 – 19	4	*
20 – 24	8	*
25 – 29	12	*
30 – 34	14	*
35 – 39	13	*
40 – 49	20	*
≥50	18	*
Place of residence		
Urban	41	90.9
Rural	48	67.0

**Denominator less than 20 observations*

Table D-11. Disaggregation of viral load testing among adults and adolescents ages 15 years and older, AKAIS 2017

Variable	n	%
Ever had a viral load test	70	45.9
Gender		
Male	16	71.0
Female	54	38.5
Age category		
15 – 19	1	*
20 – 24	6	*
25 – 29	10	*
30 – 34	14	*
35 – 39	9	*
40 – 49	16	*
≥50	14	*
Place of residence		
Urban	37	37.9
Rural	33	55.3

**Denominator less than 20 observations*

Table D-12. Access to and coverage of co-trimoxazole among people ages 15 years and older, AKAIS 2017

Variables	n	%
Currently taking co-trimoxazole	70	62.8
Gender		
Male	16	53.9
Female	54	65.4
Age category		
15 – 19	1	*
20 – 24	6	*
25 – 29	10	*
30 – 34	14	*
35 – 39	9	*
40 – 49	16	*
≥50	14	*
Place of residence		
Urban	37	58.3
Rural	33	68.1

Appendix E: List of field workers and monitoring teams

MONITORING TEAMS	
Ogbonna Amanze	National Agency for the Control of AIDS
Kenneth Alau	National Agency for the Control of AIDS
Uche Amara	Federal Ministry of Health/National AIDS and STI Control Program
Gabriel Ikwulono	Federal Ministry of Health/National AIDS and STI Control Program
Phyllis Ogah	National Primary Health Care Development Agency
Nana Sandah-Abubakar	National Primary Health Care Development Agency
Arrnold Okpani	National Primary Health Care Development Agency
Frank Akpan	Federal Ministry of Health/Department of Planning Research Statistics
Ajirioghene Ogeh	Federal Ministry of Health/Department of Planning Research Statistics

SUPERVISORS	HOUSEHOLD TRACKERS	COUNSELLORS
Sampson Akanimo Monday	Daniel, Inyang, Godwin	Etim Uduakobong Gerald
Ukoyen Essien Ubong	Alaere, Ulzen, Kate	Ekpo Abigail Felix
Akpan Etop Patrick	Alex, Samuel, Esuong	Umoren Ubiere Ezekiel
Abraham Nsikak	Linda, George, Etim	Effiong Patricia Simon
Jimmy Emily Solomon	Kufre, Okon, Etim	Udoh Ntingwut Obong
Umoh Otobong Ezekiel	Isaac, Joseph, Macauley	Ahunanyah Maxwell Ngozih
Ekong Ubong Ufot	Joyce, Edem, Peter	Nwadike Sarah Friday
Iniekung David Sunday	Wisdom Anietie Abia	Monday Comfort Jeremiah
Alexnweke Chukwunonso	Essien Victor Eyo	Tom Stella Francis
Saturday Jeffery Chukwudi	Oyom Believe Manson	Edunoh Grace Effiong
Michael Emmanuel Ikpe	Umoh Akanimo David	Jimmy Blessing Ephraim
Thompson Nsima	Eyo Victor Asuquo	Ogor Grace
Johnson Akaninyene	Nyong Nkereuwem Edet	Ntekim Mary Edet
Okon Otobong Bassey	Okon Udo Udo	Onyile Glory Edet
Ntekpere Udo Frank	Ufot Edidiong Akpan	Umoh Enoima Efefiong
Udoekpo Etifiok	Christopher Okon Johnson	Okon Essienawan Effiong
Akpan Ofonime Eseme	Mendie Emmanuel Nicholas	Ikot Godwin Monday
Akpan Imekan Isaac	John Nicholas M.	Umoren May Daniel
Gbabo David Perebekebina	Bassey Anthony Aniekan	Nwabuisi Bolanle
Okameme Austin Christian	George Ita Udoeyo	Onyashi Margaret Inah
Akpan Emmanuel Paul	Eyo Emmanuel Nyong	Etim Edidiong George
Etuk Otobong Okon	Idongesit Crispin	Ben Uduak Udofot
Akpan Emmanuel	Uwem Anthony Udoh	Ufot Stella Okon
Okon Nyakno-Obong E.	Unwana Godwin Inyang	Edet Glory Effiong
Ime Aaron Akanimo	Udoette Otokan Anieti	Thomas Itohowo Udeme
Akpan Akaninyene Udo	Akinyemi Toyin Rufus	Ibritam Augusta Alexander
Ekpenyong Francis Bassey	Inwang Victor U.	Edet Edet Ndarake

Ben Isaiah Peter	Anietie Jimmy Roberts	Udoh Esther Michael
Margaret Idorenyin Uquang	Uduakobong James	Monday Victoria Uretor
Udom Ettemfon Sylas	Unyime Emmanuel George	Udoh Blessing Felix
Essien Itoro	Olaniyi Michael Bolaji	Edem Florence Cosmas
Johnson Ukeme Effiong	Obot Sunday	Jumbo Oto-Obong Okon
Abasiubong Faith	Antia Mayen Udoh	Bassey Ema Richmond
Ayaraekpe George	Olusanya Moses Olusesan	Inyang Margaret Peter
Andu Eta Eteta	Anietie Mendie Nicholas	King- Solomon Gloria Isaac
Obochi Emmanuel Chukwueme-ka	Okono Itoro Asuquo	Inang Mary Fabian
Udoh Victor Peter	Ubong Mendie N.	Umoh Ekaette
Uzim Elochukwu	Edidiong Nyong Archibong	Unanam Solomon Okon
Umoinyang Daniel Sunday	Uwem Michael Anitie	Idem Eyaknse, Sunday
Umoren Ekaette Ezekiel	Otu Nsikan Eton	Ntuk Felicita
Ukpe Emmanuel M.	Ayatmo Akpan Sunday	Tasie Omah Adaugo
Akaninyene Patrick	Anthony Unwana Patrick	Ukpong Emem Iniobong
Akpan Uduak Okon	Oyeleke Oluwakemi Oyewumi	Ibanga Uyai Michael
Otuko Ini Michael	Etim Essien Bassey	Bassey Bassey Nse
Udoh Esther Emmanuel	Ukana Emmanuel Udoh	Philip Abasiama Jones
Allotey Cynthia	Umoh Thompson Owoidighe	Oton Anietie Okon
Archibong Usen Okon	Beatrice Ugbadu Uwanguo	Essien Mfonobong Uduak
Okon Idiongo Ema	Nto-Obong Cletus Udoh	Umoh Ofofon Monday
Akpan Imo Emmanuel	Ini Archibong Asuquo	Udom Ofonime Friday
Udoekpo Ndueheidem	Sunday Akon Ime	Okon Imo Uko
Udoh Idorenyin Harry	Udondok Matthew Effiong	Ekpo Mfon Okon
Inua Paul Etim	Imoh Michael	Etiemana Nkoyo
John Ime Effiong	Udoyen Prince Paul	Okwongudoh Matilda
Akpan Samuel Essien	Evans Harry John	Ntuen Glory Friday
Ebong Uduakobong	Akaninyene Akpabio D.	Umoh Comfort Victor
Sunday Idara	Solomon Bassey Thompson	Effiong Kubiet Emmanuel
Udofia Andrew Sampson	Ekpo Akpan Idongesit	Ukoudo Etimbuk Ime
Inyang Ekemini Akpan	Macauly Udoh Jumbo	Umoren Oto-Obong Solomon
Ukofia Anietie Friday	Angel Oliver Enang	Ubong Flora Foluke
Udoh Anietie Johnson	Udoh Udo Friday	John Unwana Uko
Akpan Mercy Godwin	Assam Okon Jackson	John Mary Mbom
Mfon Matthew Martians	Deborah Azigbo	Usen Favour Usen
Ekpo Bassey Okon	Udoh Timothy Christiana	Etobasi Ekaette Bassey Okon
Oforji Victoria Gogo	Etuk Edinyanga Godwin	Ekerete Ani James
Inyang Ntiense	Peter Ubongabasi Malachy	Bassey Enoima Edet
Etuk Mboutidem Effiong	Iberedem Godwin Etuk	Udosen Idongesit Martin
Etuk Aniebet Samuel	Ukpabio Uduakobong Effiong	Afangide Mkpoikanke Augustine
Philip Isaac Effiong	Ndifreke Okon Udoh	Ekpo Mercy Effiong
INTERVIEWERS	**LABORATORIANS**	**TRANSPORTERS**
Fred Emmanuel Nse	Chizoba Ani Immaculata	Udoh Ekaette Effiong

Iwah-Udo Edemeka S.	Momoh Joy	Mfon Edidiong Chrysanthus
Udoh Eshiet James	Bassey Etta Etim	Atakpo Unyime Emmanuel
Noah Patience John	Bassey Imo Ekong	Okon Victoria Effiong
Udoh Solomon Effiong	Henshaw Ansa Nta	Ibok Ekemini Sunday
Bassey Enobong Sylvester	Etok Eyakeno Sunday	Udosen Imo Joseph
Omadewu Patrick Saviour	Ozah Evare Peter	Umoh Elizabeth Pius
Uchegbu Uchechi Vivian	Eze Henrietta Leechi	John Sarah Etim
Ukanire Ekikere Isaac	Okon Idongesit Amos	Wilson Mammy Sampson
Nwosu Chidnma Chinwendu	Thompson Mmedaraobong Idon-gesit	Stephen Idara Emmanuel
Peter Inimfon Uduak	Okpo Eghong Okpo	Akpan Victoria Edem
Ekwueme Prince Martin	Edohoema Patience Edet	Emelogu Godswill Chimaihe
Idon Akanimo Iniobong	Essien Idongesit Emmanuel	Essang Affiong Okon
Essien Ntia Benjamin David	Ezekiel Iniobong Unyime	Ulor Victor Effiong
Atadiaha Mary Emmanuel	Seun Fapohunda Joshua	Edohouqua Imaobong Sunday
Ossom Sifon Bassey	Eneze Promise Ebele	Etukudo Idongesit Udofot
Usoro Ukeme Sylvester	Emmason *Eyakmmo Otobong	Ekpu Udeme Emmanuel
James Archibong	Smith Michael Stephen	Umoh Abasi-Ibiangake Peter
Uwa Nyetiabasi Isaac	Okon Bassey Ibanga	Akrah Mercy David
Uduak Joe Akpan	Inyang Affiong Effiong	Akwarandu Tochi Gold
Tom Anietie Daniel	Okon Unyime Saturday	Akpan Enomfon Peter
Udoetok Victoria Francis	Njoba Francis Chinasa	Clement Uduakobong Augustine
Esio Godwin Okon	Peter Happiness Udeme	Offiong Onyinye Juliet
Uwah Itoro Ezekiel	Udofia Deborah Uwem	Kefre Idara Eno
Obong Edet Edoabasi	Jaja Imiegbam Adawari	Usoro Ubong Bassey
Mkpokporo Albert Albert	Chinweokwu Kris Ada	Ikafia Mbiatke Sam
Johnson Mkpongke Aniefiok	Ikpang Itoro Edet	Akpan Vincent Udofia
Offiong Godwin Etim	Agu Chidozie Elochukwu	Esenowo Joel Etim
Usirado Deborah	Dick Jovita Cletus	Ukim Ima Aniefiok
Bassey Joseph Bassey	Emah Nsidibe Inyang	Mbatt Iniabasi Okon
Etuk Inimfon Robinson	Itakiri Veronica Emmanuel	John Idara Dominic
David Goodness Mosiokpahe	Eyinda Confidence	Udo Eno-Obong Jackson
Ebieme Esio Essang	Uma-Mba Blessing Onyinyechi	Nkemka Jerome Odinaka
Ajiamah* Goodwill Udukhokhai	Akpabio Utibe Victor	Etefia Malachi Ukpabio
Akpan Idongesit Effiong	Eshovo Raji	Uduehe Glory Emmanuel
Nyabong Eduwem Asuquo	Njemanze Chigozie G.	Utong Mfon Monday
Udom Ofonime Sunday	Alfred Utibe-Abasi Okon	Bassey Magdalene James
Inam Kingsley Jimmy	Usen Ime Okon	Okoro Aniebiet James
Udofia Sunday Stephen	Udoh Precious Inyang	Anaikot Obonama Charles
Eke Fortune Chukuemeka	Ogban Onyi Eko	Udoumoh Emaekop Daniel
Ugbadu John Ikpe	Ekanem Asi Emmanuel	Akpan Sifon Albert
Ebong Ubong Victor	Osim Ogar Amba	Udo Nsemeke Friday
Alagi Alex Omenka	Akiki Ukpong George	Umoren Emmanuel Anthony
Edem Christiana Patrick	Ekeng Effiom Enewa	Ekong Mary Pius

Udo Idongesit Asukwo	Paul Mfon Henshaw	Essien Ini Ita
Otoho Anthony Anthony	Egbuta Ihuoma Helen	Udoh Edidiong Elijah
Etop Ekpo Akpan	Ben Ndifreke Sunday	Mbaba Ubong Christopher
Mfonobong Uduak Essien	Odia Itua Daniel	Essien Inemesit Ekpe
Osuji Zurishaddai Ebubechukwu	Etukudo Idiongo Ita	Nwaokonko Dennis Uju
Eyibio Efefiong Effiong	Eboh Unwana Benedict	Williams Uduak Ita
Afangide Nsetip George	Iloeje Uchenna Patience	Otumudia Ejiroghene Ebere-chukwu
Imeh Mboutidem Ikpe	Obidile Valentine Chidi	Ukott Akaniyene Gabriel
Udoh Margaret Akpan	Ekpe Edoama Bassey	Etuk Victoria Friday
Bassey Ekaette Owoidoho	Edupute Chukwuma Emmanuel	Philips Philips Stanley
Etim Timkere Edem	Morphy Ekaji Regina	Akpan Nko Edet
Ebongho Mfonobong Uwem	Etim Matilda Gabriel	Udoinyang Idongesit Item
Atansek Faith Emmanuel	Essien Clement Francis	Usoro Ekaette Udom
Enyiekere Magdalene Emmanuel	Aboaja Chinonso Lydia	Asuquo Nsini Augustine
Ayanlola Rhoda Olayemi	Akpan Inyene Mfon	Ekpo Nseobong Patrick
Sunday Uduak Edet	Stephen Uboho Nse	Umoren Ekemini Edet
Akpusugh Terwase Simon	Akpan Salome Charles	Ambrose Esther Ime
Akpan Nsikan John	Rufus Eka Edidiong	Udo Maria Romanus
Usoro Enobong Okon	Udo Kufre Emmanuel	Mene-Josiah Stephanie Leera
Israel Ovie Lucky	Manuba Chukwuka Michael	Omang Donald Ikwun
Udoibok Victoria Clement	Essang Patience Essang	Mwantwa David James
Eyo Chinyere Albert	Edet Sunday Odokwo	Idem Ekomobong Effiong
Essien Mfon Nyong	Tokede Tolulope Francisca	Bassey Utibeabasi Michael
Effiong Andrew Edet	Okon Christiana Nyong	Robert Mojana Ebirien
Edem Dominica Hanson		Anwan Anyiete George Henry
Ekpo Nsekong Desire	**MONITORS/ FACILITATORS**	Udo Peter Justin
Itumoh Shedrack Onyebuchi	Ogbonna Amanze	Essien Uwem Ita
Udom Samuel Udeme	Kenneth Alau	Jumbo Josephine Ukachi
Sam Mbuotidem Rufus	Uche Amara	Okon Roseline George
Edem Florence James	Gabriel Ikwulono	Joseph Mabel Sunday
Ebegbulam Mercy Eberechukwu	Phyllis Ogah	Ibekwe Aniebiet James
Ignatius Joseph Akpan	Nana Sandah-Abubakar	Edem Ikwo Asukwo
Archibong Augusta, Esemin	Arnold Okpani	Udoekpo Esang Bernard
Sunday Runyi Inah	Frank Akpan	Etim Unyim Afangideh
Udo Uwakmfonabasi Udo	Ajirioghene Ogeh	Joseph Unyime Ephraim
Ebe Ofonmbuk Samuel	Dr. Dominic Ukpong	
Iyak Helen Joseph	Mr. Bassey Attih	
Ekpo Felicia Franklin	Dr. Godwin Ebuk	
Asuquo Ifiok Inyang	Dr. Martin Akpan	
Gbev Emmanualla Nguevese	Dr. David Etuk-Essien	
Etokudo Michael Raphael	Dr. Iboro Udo	
Essien Ubong Dickson	Patricia Akpan	
Usoro Andrew Christiana	Tiebet Udofia	

Williams Emem Victor	Mercy Valentine	
Akpan Kufre Victor	Christiana Udoata	
Jude Abasiama Friday	Nsemeke Udoudo	
Jackson Ekereobong Sampson	Inimfon Ibibio Umoh	
Akpan Theophilus Elijah	Ekom Mendie	
Obosi Udeme Ezekiel	Emediong Udo	
Ekpe Ubong Alexander	Mary Uyara	
Ahaotu Amarachi Confidence	Pius Umanah	
Akpan Anietie Jimmy	Emem Udo	
Samuel Ubon Edet	Ekong Ubong Offord	
Okoye Chidinma	Isobara Raphael	
Etuk Emmanuel Eno	Emmanuel Ekong	
Ekemini Emmanuel Ekong	Godfrey Akro	
Abasiubong Joy Iniobong	Rashidat Mamudu	
Ambrose Prosperity Dominic	Emem Edet Essien	
Nseobot Favour Archibong	Ukpong Nelly Inyang	
Akpan Victoria Uduak	Bassey Etim	
Obot Amanam Uko	Monday Sunday Emmanuel	
Okafor Ifeanyi Phillip	Cartier Simon	
Sampson Samuel Joseph	Yemisi Ogundare	
Uboho Ukut	Udofot R. Umoh	
Ohiero Martha Onwu	Michael Akpan	
Stanislaus Ntiense Ubon	Grace Udoyen	
Etim Ofonmbuk Edet	Ogesanmola Omitayo	
Bassey Ransom Eke	Mr. Aboho	
Umoren Itoro James	Mr. Funsho Johnson	
Oguma Ephphatha	Ogbonna Amanze	
Etim Grace Abasiofiok	Sandah Nana Abubakar	
Uwah Idorenyin Ezekiel	Uche Amara	
Stephannie Anyaegbu	Felicia Umaru	
Wada Adaji	Vivian Okeke	
Ismail Abdulrahman	Joseph Okoegwale	
Joseph Okoegwale	Ebelenna Okoye	
Akannimo Udotim	Emmanuel Iroko	
Azubuike Olisa	Olugbenga Ogunlade	
Patrick Ikani	Teryima Uza	
Etim Utitofon Eseme	Monday Danung	
Eyo Otu-Ita	Ifunanya Nnaemeka	
Eyo Uwem Samuel	Dr Mrs Umoffia	
Ikpe Esitekom Ememobong	Robson Akpan	
Charlie Idongesit Gabriel	Idongesit Udoh	
Essien Dorcas Elijah	Kings Akpan	
Akpabio Nsisong Samuel	Feyisayo Jegede	
Dominic Blessing	Olubunmi Negedu-Momoh	

Nyang Udemeobong Edet	Umoette Ntiense	
Assi Affiong Okon	Akhigbe Oziegbe Paul	
Uwah Uduak Alwell	Attih Esther B.	
Obot John Solomon	Ahmed Bolla	
Mfon Idongesit Chrysanthus	Ekpenyong Ekaette	
Inokon Ufon-Abasi Effiong	Igri Ebunlomo	
Usoro Idoreyin Udofe	Patience Okon	
Enobong Justin Ibiok	Godwin Archibong	
Okokon Anietie Bassey	Helen Amakwe	
Mbia Rebecca Enop	Olayinka Adenuga	
Urua Glory Dennis	Frank Akpan	
Asuquo Mfoniso Usen		
Essiet Utibe Harry	Dr Edidiong Umoffia	
Mboho Mfonobong Ekom	Oyetunde Akinloye	
Robinson Joy Inyang	Kingston Omo-Emmanuel	
Akpan Mercy Joshua	Kufreabasi Isaac	
Esshiet Edidiong Esshiet	Nkerewuem Ndem	
Akpanidop Betini Sunday	Eloghosa Omorogbe	
Okon Eunice Edet		
Edet Gabriel Etim	Anastasia Isika	
Nandi-Esom Sylvester Nkra	Lucy Ekpo	
Wilson Israel Ikpe	Ekanem Anyiekere Morgan	
Itim Emem Okon	Babasoji Asuni	
Sule Ismaila Ocholi	Nwosu Philip	
Williams Ubong Victor	Idopise Inyang	
Ekwere Ekaette Michael	Samson Soetan	
Okon Margaret Inyang	Judith Onwuasoigwe	
Aniema Edem Jimmy	Michael Ariyo	
Ukana Precious Emmanuel	Akan Etuk	
Uboh Edidiong Friday	Onasochi Inyang	
Johnson Naomi Paul	Joseph Okeogwale	
Kufre Gabriel Uffot	Ebelenna Okoye	
Udom Nse Mfon	Akanimo Udotim	
Mboko Etimbuk James	Emmanuel	
Afangide Ndifreke George	Victor Edem	
Ogwunte Joy Isaac	Akwa Nsikan Etukudo	
Ubulom Sarah Adasi	Idongesit Omelle	
John Enerene Friday	Grace Ekpo	
Michera Bassey Anslem	Aniedi Michael	
Solomon Bassey Ema	Rev. Sr Regina Useh	
Joshua Emem Udofia	Sr Justina Ubah	
Ndifon Queenmary Asu	Mfon Isaiah Utuk	
Ekaobong Aniefiok Idongesit	Anthony Lawrence	
Okon Emmanuel James	Emmanuel Blankson	

Udoh Moses Ramsel	Udeme Emmanuel Gabriel	Volunteers
Usoroh Ekikere Etim	Udontuk Aniema Sebastian	Goodness Elijah
Ita Esther Otu	Glory Ekwere	Effefiom Orok
Udonsa Akaniyene Cyrinus	Iniobong Isong	Emem Umoh
Samuel Emem Aniefiok	Okpala Kingsley Arinze (Late)	Peter Ayabi
Etuk Edidiong Emmanuel	Daniel Antigha	Mmenyene Benedict
Ulagba Elizabeth Ene	Udeme Okon	Emem Edet
Udo Nsini Okon	Noah Mario Samuel	Emem Udom
Udo Akaniyene David	Pius Udoinyang	Idorenyin Ekong
Blessing Edobor	Etima Ntukidem	Ebenezer Ogunuase
Udoumoh Aniekpeno Francis	Iniobong Abasibom	Ikponoabasi Utuk
Ekanem Solomon Udo	Shadrach Inyang Lawrence	Ubong Edet
Akpan Ndifreke Solomon	Barthlomew Igwe	Esther Akpan
Onofiok Uduak Philip	Idongesit Udo	Ibah Betseobong
Amirize Chioma Mary	Ukeme Gideon Etuk	Bolaji Adewole
Eyoh Faith Vincent		Uduak Peter
Udofia Ndifreke Ezekiel		Akpan Ekwere
Okon Donatus Dickson		Cyril Okon
Iyang Mfon Jack		Owoidoho Ekanem
Ikoedem Mfon Ben		Annieye Nkanga
Phan Phan Samuel		Melody Aliche
Micheal Otobong Aniekan		Mmedara Emma
Unwausen Ndifreke Ezekiel		Onyekwelu Chibuzor
Udo Udim Thompson		Okon Imeobong
Frank Aniefiok Aniefiok		Ime Isaiah
Bassey Moses Obeten		Owoedinyene Sam
Erim James Jude		
Dickson Henry Eshiet		
Akpan Udeme David		
Warrie Abel Sunday		
Pepple Dimieara Festus		
Okon Mbuotidem Anietie		
Okon Wisdom James		
Inyang Nsikan-Abasi Ime		
Akpan Kufre Gabriel		
Marrak Utibe Donatus		