



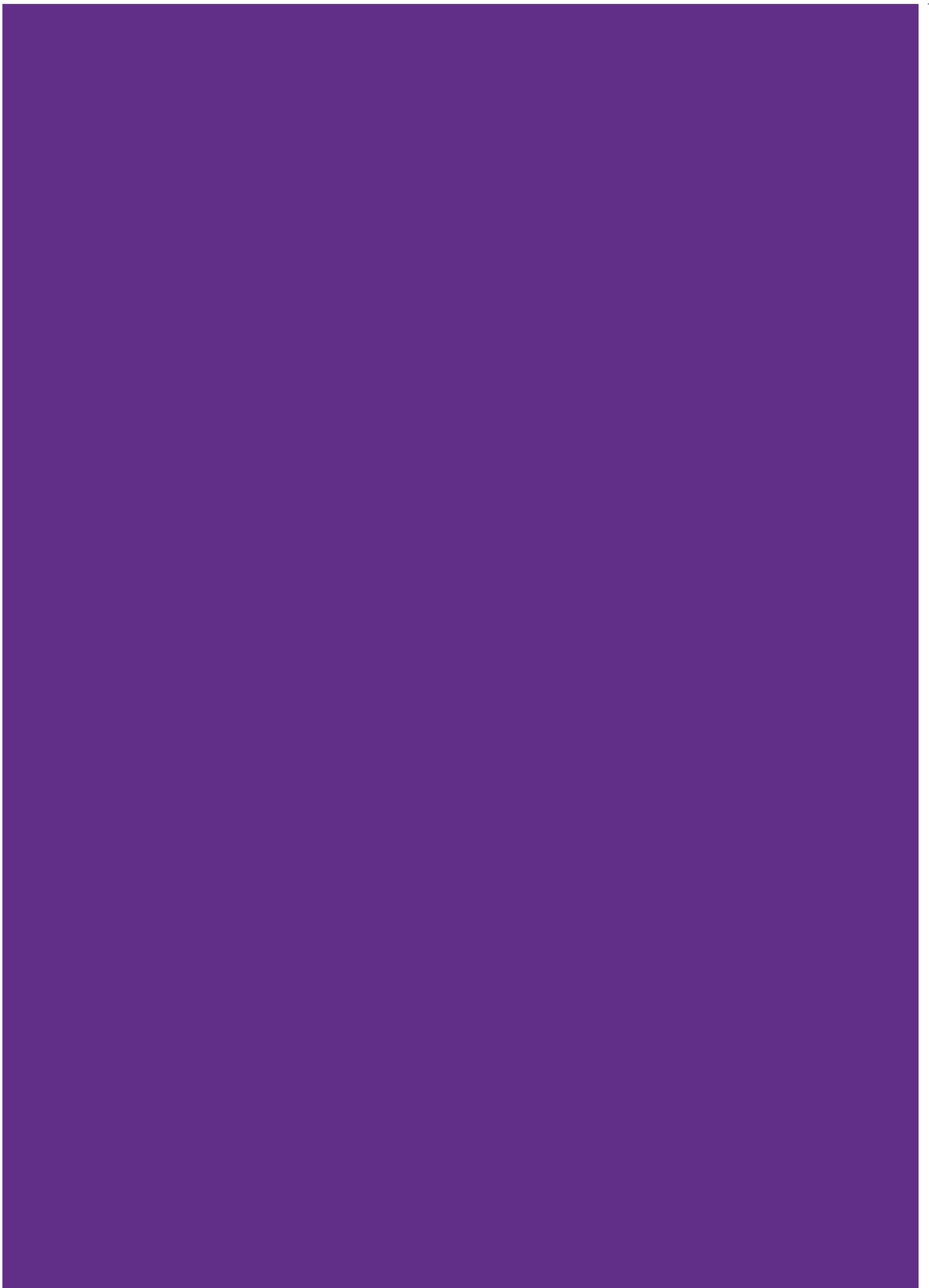
Republic of Kenya

**KENYA AIDS INDICATOR SURVEY 2012**

**K A I S**



**Preliminary Report**





Republic of Kenya

# **KENYA AIDS INDICATOR SURVEY 2012**

## **PRELIMINARY REPORT**

**NATIONAL AIDS AND STI CONTROL PROGRAMME**  
Ministry of Health, Kenya  
September 2013

PRELIMINARY REPORT

**KENYA AIDS INDICATOR SURVEY 2012**



## **KAIS 2012 Collaborating Institutions**

National AIDS and STI Control Programme (NASCOPI)  
Kenya National Bureau of Statistics, (KNBS)  
National Public Health Laboratory Services (NPHLS)  
National AIDS Control Council (NACC)  
National Council for Population and Development (NCPD)  
U.S. Centers for Disease Control and Prevention (CDC)  
Kenya Medical Research Institute (KEMRI)  
University of California San Francisco (UCSF)  
Joint United Nations Team on HIV and AIDS  
The World Bank  
Japan International Cooperation Agency (JICA)  
United States Agency for International Development (USAID)  
Elizabeth Glaser Paediatric AIDS Foundation (EGPAF)  
Liverpool Voluntary Counselling and Testing (LVCT)  
African Medical and Research Foundation (AMREF)

## **Donor Support**

KAIS 2012 was made possible through technical and financial support provided by the U.S. President's Emergency Plan for AIDS Relief (PEPFAR), Joint United Nations Team on HIV and AIDS, the Global fund, the World Bank, and JICA

## **Suggested Citation**

National AIDS and STI Control Programme, Ministry of Health, Kenya. September 2013. Kenya AIDS Indicator Survey 2012: Preliminary Report. Nairobi, Kenya.

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## GLOSSARY OF TERMS

**Acquired Immunodeficiency Syndrome (AIDS):** AIDS is a disease caused by infection with the human immunodeficiency virus (HIV). AIDS results in severe damage to the immune system, leaving the body vulnerable to life-threatening conditions such as infections and tumours.

**Antiretroviral Therapy (ART):** Treatment with antiretroviral drugs that inhibit the ability of HIV to multiply in the body, leading to improved health and survival among HIV-infected persons.

**CD4+T-Cells:** CD4+ T-cells are white blood cells that are an essential part of the human immune system. These cells are often referred to as T-helper cells. HIV attacks and kills CD4+ T-cells leaving the body vulnerable to a wide range of infections. The CD4+ T-cell count is used to determine the degree of weakness of the immune system from HIV infection and can be used to determine the need for and response to ART.

**Co-trimoxazole (CTX):** An antibiotic used in the treatment of a variety of bacterial infections. Kenya's national guideline recommends that co-trimoxazole be given as prevention to all people with HIV to prevent some opportunistic infections.

**Human Immunodeficiency Virus (HIV):** HIV is the virus that causes AIDS. The virus is passed from person to person through blood, semen, vaginal fluids and breast milk. HIV attacks CD4+ T-cells in the body, leaving the infected person vulnerable to illnesses that would have otherwise been eliminated by a healthy immune system.

**HIV Prevalence:** The proportion of living persons in a population who are infected with HIV at a specific point in time.

## LIST OF ABBREVIATIONS

<b>AIDS</b>	Acquired Immunodeficiency Syndrome
<b>AIS</b>	AIDS Indicator Survey
<b>ANC</b>	Antenatal Care
<b>ART</b>	Antiretroviral Therapy
<b>ARV</b>	Antiretroviral Drug
<b>CD4</b>	CD4+ T-cell
<b>CDC</b>	Centers for Disease Control and Prevention
<b>CTX</b>	Co-trimoxazole
<b>GoK</b>	Government of Kenya
<b>HBTC</b>	Home-Based Testing and Counselling
<b>HIV</b>	Human Immunodeficiency Virus
<b>KAIS</b>	Kenya AIDS Indicator Survey
<b>KDHS</b>	Kenya Demographic and Health Survey
<b>KNASP</b>	Kenya National HIV/AIDS Strategic Plan
<b>NASSEP</b>	National Sample Survey and Evaluation Programme
<b>KNBS</b>	Kenya National Bureau of Statistics
<b>NACC</b>	National AIDS Control Council
<b>NASCOP</b>	National AIDS & STI Control Programme
<b>NHRL</b>	National HIV Reference Laboratory
<b>PMTCT</b>	Prevention of Mother-to-Child Transmission
<b>POC</b>	Point-of-Care
<b>SAS</b>	Statistical Analysis Software
<b>WHO</b>	World Health Organization

## SUMMARY OF KEY PRELIMINARY FINDINGS FROM KAIS 2012

- HIV prevalence among adults aged 15 to 64 years decreased nationally from 7.2%, as measured in KAIS 2007 to 5.6% in 2012. HIV prevalence among children aged 18 months to 14 years was 0.9%.
- HIV prevalence among adults varied by region, with the highest prevalence in Nyanza and lowest prevalence in the Eastern North region. While most regions showed a decreased prevalence from 2007, substantial drops were identified in the Coast, Nairobi and Rift Valley regions.
- Levels of HIV testing have increased with 72% of adults aged 15 to 64 years in 2012 reporting ever having been tested for HIV, a significant increase from 34% in 2007.
- Despite the increase in HIV testing levels, 53% of survey participants found to be infected during KAIS 2012 were not aware of their HIV infection. However, this was a substantial improvement from 2007 where over 80% of HIV-infected persons did not know they were infected.
- The proportion of men who were circumcised increased nationally from 85% in 2007 to 91% in 2012. Nyanza region observed the highest increase in male circumcision rates, from 48% in 2007 to 66% in 2012.
- Low levels of consistent condom use were observed among individuals who reported a sexual partner of discordant or unknown HIV status. This observation held for both women and men aged 15 to 64 years.
- Ninety-two percent of women who gave birth between 2007 and 2012 and attended antenatal care (ANC) for those pregnancies had been tested for HIV infection at ANC, compared to 65% in 2007. Of those who were diagnosed with HIV at ANC, 90% received either maternal or infant antiretroviral prophylaxis to prevent mother-to-child transmission of HIV (PMTCT).
- Reported use of co-trimoxazole was 42% among HIV-infected persons aged 15-64 years. However, use of co-trimoxazole among those who were aware of their HIV infection was high, at 89%.
- Fifty-eight percent of HIV-infected persons aged 15-64 years were eligible for antiretroviral therapy (ART) treatment for HIV infection based on a CD4+ T-cell count of 350 cells/ $\mu$ l or less or reported history of current tuberculosis treatment. Of those, 63% were currently on ART. Among those on ART, 78% achieved viral suppression. However, viral suppression among all HIV-infected persons, regardless of awareness of HIV status and ART use was low, at 40%.

## INTRODUCTION

### 1.1 Background

AIDS Indicator Surveys (AIS) were developed to provide countries with a standardised tool for monitoring nationally-representative HIV/AIDS indicators in the general population in order to evaluate the response to the HIV epidemic and to inform HIV policy. The first AIS in Kenya was conducted in 2007 (KAIS 2007) and provided epidemiologic information on HIV, sexually transmitted infections, risk behaviours, and access to HIV prevention, care, and treatment services [1]. Results from KAIS 2007 led to important changes in HIV programming and policy for HIV prevention, care, and treatment in the country.

### 1.2 Overview of KAIS 2012

From October 2012 to February 2013, the Government of Kenya conducted the second AIS (KAIS 2012) among children and adults aged 18 months to 64 years to evaluate HIV care, treatment, and prevention programmes and to inform new strategies to respond to the HIV epidemic in Kenya.

KAIS 2012 differed from KAIS 2007 by including:

- Children aged 18 months to 14 years in the sample to estimate the number of HIV-infected children and the number in need of HIV treatment.
- A paediatric module to describe testing and clinical characteristics of children aged 18 months to 14 years.
- A behavioural interview for young adolescents aged 10 to 14 years.
- An expanded behavioural module on adult HIV risk behaviour, including transactional sex, drug use, anal sex, and correct and consistent condom use.
- An opportunity for survey participants to receive home-based testing and counselling (HBTC) to learn their HIV status at the conclusion of the survey and, for persons found to be HIV-infected, in-home measurement of CD4+ T-cell counts to immediately determine treatment needs.
- Viral load testing for all HIV positive samples.

The specific objectives of KAIS 2012 were to:

- Determine HIV prevalence among persons aged 18 months to 64 years.
- Describe the socioeconomic and behavioural risk factors associated with HIV infection.
- Determine the incidence of HIV infection among persons aged 18 months to 64 years.
- Determine need and use of HIV care and treatment services among HIV-infected persons aged 18 months to 64 years.
- Determine the use of HIV prevention services among persons aged 18 months to 64 years.

## DESIGN AND METHODS

### 2.1 Geographic Coverage and Target Population

KAIS 2012 was a cross-sectional, population-based survey that sampled 9,300 households within nine of the 10 National AIDS and STI Control Programme (NAS COP) programmatic regions. These regions include urban and rural areas of Nairobi, Central, Coast, Eastern North, Eastern South, Nyanza, Upper Rift, Lower Rift, and Western regions. The sampling frame was not available for the North Eastern region at the time of the survey. The target population was persons aged 18 months to 64 years.

### 2.2 Sampling Frame and Design

The survey used two-stage stratified cluster sampling where the first stage selected 372 out of 1,800 clusters from the Kenya National Bureau of Statistics (KNBS) household-based sampling frame and the National Sample Survey and Evaluation Programme (NASSEP V) [2] using probability proportional to size (PPS) method. The second stage randomly selected a sample of 25 households in each cluster from a roster of households in the cluster using systematic random sampling.

Households that were eligible for the child sample (individuals aged 18 months to 14 years) were pre-selected during the sampling phase. During data collection, if a pre-selected household did not have an eligible child, the next pre-selected household was visited until all pre-selected households in the cluster with at least one eligible child were identified.

The sample size was calculated to provide representative national, regional, urban and rural estimates of HIV infection among adults and adolescents aged 15 to 64 years and national HIV prevalence estimates for children aged 18 months to 14 years. The target sample size was 23,896 for women and men aged 15 to 64 years and 8,226 for children aged 18 months to 14 years. Table 1 below shows the distribution of sampled clusters and households by region.

**Table 1: Distribution of sampled clusters and households by NAS COP region, KAIS 2012**

Region*	Clusters			Households		
	Rural	Urban	Total	Rural	Urban	Total
Nairobi	0	51	51	-	1,275	1,275
Central	31	16	47	775	400	1,175
Nyanza	33	12	45	825	300	1,125
North Rift	23	8	31	575	200	775
South Rift	23	11	34	575	275	850
Eastern North	24	11	35	600	275	875
Eastern South	33	9	42	825	225	1,050
Western	33	8	41	825	200	1,025
Coast	25	21	46	625	525	1,150
<b>Total</b>	<b>225</b>	<b>147</b>	<b>372</b>	<b>5,625</b>	<b>3,675</b>	<b>9,300</b>

\*Central region includes Kiambu, Kirinyaga, Murang'a Kiambu, Nyandarua, and Nyeri counties; Coast region includes Kilifi, Kwale, Mombasa, Lamu, Tana River, and Taita/Taveta counties; Eastern North region includes Isiolo and Marsabit counties; Eastern South region includes Embu, Tharaka-Nithi, Kitui, Machakos, Makeni, and Meru counties; Nairobi region includes Nairobi county; North Rift region includes Trans-Nzoia, Baringo, Elgiyomarakwet, Uasingishu, Turkana, West Pokot, and Nandi counties; Nyanza region includes Nyamira, Kisii, Homabay, Migori, Kisumu, and Siaya counties; South Rift region includes Kajjado, Nakuru, Bomet, Kericho, Laikipia, Narok, and Samburu counties; Western region includes Bungoma, Kakamega, Bungoma, Busia, and Vihiga counties.

### 2.3 Eligibility Criteria, Recruitment, and Consent Procedures

The survey population was persons aged 18 months to 64 years who were usual household residents or slept in the household on the night before the survey. Adults and children with cognitive or hearing disabilities that would prohibit them from participating in the survey were excluded.

The head of household provided verbal consent for his or her household to participate in the survey and completed the household interview. The head of household was defined as an adult aged 18 years or older who was a usual resident of the household and was recognized as a decision-maker by other household members. In the absence of an adult household member, an emancipated minor (an individual less than 18 years of age who was married, pregnant, or had children) who resided in the household was recognized as the household head and able to provide consent for the household interview. If the head of household was not available to consent and there was no alternate adult head of household, the household was considered not eligible for the survey.

Individual consent was sought from eligible adults or emancipated minors for an interview, collection of blood specimen for biologic testing at the National HIV Reference Laboratory (NHRL) in Nairobi, and storage of samples at NHRL for future tests. A parent or guardian was required to provide verbal consent for participation of minors (those less than 18 years of age). Verbal assent was also obtained from children aged 10 to 17 years whose parents or guardians had consented to their participation. Emancipated orphans aged 10 to 14 years with no guardian present were excluded from the survey. All participants had the choice to consent to the interview alone or to both the interview and the blood draw.

### 2.4 Survey Implementation

#### *Survey Teams*

40 field teams participated in KAIS 2012 data collection. Each team consisted of a supervisor; interviewers that administered the survey questionnaires; laboratory technicians that conducted the blood draw and point-of-care (POC) CD4+ T-cell count testing and processed the samples for transport to the central laboratory; and a HBTC service provider who provided HIV testing and counselling services to participants. One laboratory technician on each team was a certified HIV testing counsellor and able to provide HBTC when needed.

#### *Community Sensitisation and Mobilisation*

During field work, print and electronic media was used to raise awareness and facilitate communication about the survey at the national, regional, district, and cluster levels. In addition, district- and cluster-level mobilisation was conducted, with mobilisers working with local leaders and organisations to gain access and acceptability in the community prior to the arrival of field teams.

#### *Survey Instruments*

The head of household completed the household questionnaire providing information on all eligible members within the household (Table 2). The household questionnaire also collected data on the

support of orphans and vulnerable children within the household, the physical and sanitary conditions of the home, household possessions and household food security. Interviewers administered adult questionnaires (male and female) to persons aged 15 to 64 years that collected information on demographic characteristics; reproductive and children's health; sexual behaviour; HIV-related knowledge and attitudes; HIV testing; injections and blood transfusions and donations; circumcision (for men); non-prescription drug use; and migration. Eligible children aged 10 to 14 years were administered a questionnaire that collected information on demographic characteristics; knowledge about and attitudes toward HIV; sexual behaviour; HIV prevention, care, and treatment services; and alcohol and drug use. Data were recorded on portable net book computers (Mirus Innovations, Mississauga, Ontario, Canada), using software specifically designed for the KAIS questionnaires.

#### *Sample Collection*

Survey participants provided a venous blood sample for HIV, CD4+ T-cell counts, viral load, and future testing at NHRL. If a participant was unable to or refused to provide a venous blood sample, dried blood spot (DBS) samples from a finger prick were requested. At the end of each day, DBS cards were prepared from venous blood samples. Both the DBS cards and venous blood samples were transported to NHRL for testing.

#### *HIV Home-Based Testing and Counselling*

As a service to study participants, respondents were given the opportunity to learn their HIV status within their homes through HBTC using the blood samples collected for the survey or from a separate finger prick. Methods for HBTC were consistent with national guidelines for HIV testing [3]. HBTC used a parallel HIV testing algorithm with two rapid tests: Determine-HIV-1/2 (Inverness Medical, Massachusetts, USA) and Unigold (Trinity Biotech PLC, Ireland). Participants with discrepant results (i.e. a positive test on one rapid test and negative test on the other rapid test) were referred to a health facility for re-testing. If a participant tested HIV positive in HBTC, she or he was offered a POC CD4+ T-cell count test to determine treatment and care needs. CD4+ testing was done using a PIMA CD4 analyser (Alere, Inc., Waltham, Massachusetts, USA).

Parents or guardians of children aged 18 months to nine years received the results on the children's behalf and were counselled by the HBTC service provider on how to disclose results to children. Children aged 10 to 14 years received results in the presence of a parent or guardian, while adolescents aged 15 to 17 years were given the opportunity to receive their results with or without a parent or guardian present. All participants who tested HIV positive in HBTC were provided with a KAIS 2012 referral form and were referred to comprehensive care facilities to seek routine care and treatment services.

**Table 2: Data sources in KAIS 2012**

<p>Household Questionnaire</p> <ul style="list-style-type: none"> <li>• Household census</li> <li>• Parental survivorship</li> <li>• Household characteristics and possessions</li> <li>• Support for orphans and vulnerable children</li> </ul>	<p>Biologic testing</p> <ul style="list-style-type: none"> <li>• Venous and dried blood spot specimens collected to test for HIV (DBS), CD4+ T-cell count (venous blood), viral load (DBS), and future tests (DBS) at the NHRL</li> <li>• In home HIV and POC CD4+ T-cell count testing offered</li> </ul>
<p>Adult Questionnaire (15-64 years)</p> <ul style="list-style-type: none"> <li>• Socio-demographic characteristics</li> <li>• Reproduction, fertility, and family planning</li> <li>• Male circumcision</li> <li>• Marriage and sexual history</li> <li>• Drug use</li> <li>• HIV knowledge, attitudes, and behaviours</li> <li>• HIV testing</li> <li>• Access to HIV prevention, care and treatment services</li> <li>• Tuberculosis and other health issues</li> <li>• Blood safety and injection</li> <li>• Migration</li> </ul>	<p>Child Questionnaire (10-14 years)</p> <ul style="list-style-type: none"> <li>• Socio-demographic characteristics</li> <li>• HIV knowledge, attitudes, and perceptions</li> <li>• Sexual activity (for children aged 12-14 years only)</li> <li>• HIV testing</li> <li>• Male circumcision</li> <li>• Alcohol and drug use</li> <li>• Participation in HIV prevention interventions</li> <li>• HIV stigma</li> </ul>

*Supervision*

Data collection teams were regularly supervised by teams of national supervisors with representation from different KAIS 2012 collaborating institutions. These supervision teams visited the field teams across the country to deliver survey supplies, perform quality checks on data completeness, provide technology support, assess mobilization efforts, and help address challenges to data collection. Supervision reports were circulated to the KAIS 2012 technical working group for response to any issues.

## 2.5 Laboratory Field Methods

Blood specimens were transported to NHRL for biological testing. Specimens were tested for HIV antibody using the Vironostika HIV-1/2 UNIF II Plus O Enzyme Immunoassay (bioMérieux, Marcy d'Etoile, France) and reactive results were confirmed using the Murex HIV.1.2.O HIV Enzyme Immunoassay (DiaSorin, SpA, Saluggia, Italy). Repeat testing was conducted for discordant results, and if results remained discordant, final results were obtained using polymerase chain reaction (Cobas AmplicorHIV-1 Monitor Test, v1.5, Roche Molecular Diagnostics, Pleasanton, California, U.S.A.). CD4+T-cell counts and percentages were measured using BD FACS Calibur flow cytometer (Becton Dickinson Biosciences, San Jose, California, U.S.A.). CD4+T-cell counts from a 10% random sample of HIV negative specimens were measured to quantify reference values. All laboratory-confirmed HIV positive specimens were tested for HIV RNA concentration (Abbott M2000 Real-Time HIV-1 Assay, Abbott Laboratories, Abbott Park, Illinois, USA). Participants with HIV RNA concentrations of fewer than 1,000 copies per mL were classified as meeting the World Health Organization (WHO) threshold for viral suppression at the time of the survey [4]; those with HIV RNA concentrations of less than 550 copies per mL, the minimum concentration detectable on the assay, were classified as virologically suppressed at threshold of 550 copies per mL [5].

## 2.6 Data Processing and Analysis

All field data collected were transmitted to a KAIS 2012 central server using a secure virtual private network and stored in Microsoft SQL Server 2008 (Microsoft Corporation, Redmond, Washington, USA). Where wireless networks were not available, supervisors uploaded the data manually on secure data cards during regular supervision visits. Data cleaning was conducted using SAS version 9.3 (SAS Institute Inc., Cary, North Carolina, USA). Laboratory data were cleaned and merged with the final questionnaire database using unique specimen barcodes and study identification numbers. The sampling weights were computed to correct for unequal probability of selection to provide survey results that were representative of the larger population, and to adjust for non-response. All results presented in the report are based on weighted estimates, except for the survey response rates.

Preliminary descriptive analysis of response rates, estimation of HIV prevalence and assessment of CD4+ T-cell count distribution, sexual behaviour, HIV testing behaviour, knowledge of HIV status and usage of ART and co-trimoxazole (CTX) was conducted using SAS version 9.3 (SAS Institute Inc., Cary, North Carolina, USA). Trends were assessed to determine if there were changes in key indicators between KAIS 2007 and KAIS 2012. For trend analyses, North Eastern region was excluded from the KAIS 2007 dataset to ensure comparability between the two surveys. Data are presented separately for persons aged 15 to 64 years and children aged 18 months to 14 years.

## PRELIMINARY RESULTS

### 3.1 Survey Response Rates

Household response rates were calculated as the number of households consenting to the household interview out of the total number of eligible households. Vacant, destroyed, or missing households were excluded from the study. Individual interview response rates were calculated as the number of persons who completed the interview divided by the number of persons who were eligible for the survey based on the household census. For adults, only those consenting to the interview could participate in the blood draw component of KAIS 2012. The adult blood specimen collection response rate was calculated as the number of specimens collected divided by the number of persons who were eligible for the survey and completed the adult interview. Children aged 18 months to 14 years were eligible for the blood specimen collection regardless of whether the interview was completed. The blood draw response rate for children was calculated as the number of blood specimens collected divided by the number of persons who were eligible for the survey.

Participation rates in KAIS 2012 were high (Table 3). Of the 9,300 households sampled, 9,189 (99%) were eligible for the survey, and 87% of eligible households completed household-level surveys. Rural households (89%) had higher household interview response rates than urban households (85%).

**Table 3: Survey response rates, KAIS 2012\***

	Total	Female	Male	Urban	Rural
Eligible households	9,189	-	-	3,683	5,506
Household interview response rate	87%	-	-	85%	89%
<b>Individuals aged 15-64 years</b>					
Eligible for interview	16,383	8,931	7,452	6,093	10,290
Interview response rate	84%	89%	77%	83%	84%
Eligible for blood draw	13,720	7,954	5,766	5,082	8,638
Blood draw response rate (15-64 years)	85%	85%	84%	81%	87%
<b>Children aged 18 months to 14 years</b>					
Eligible for interview (10-14 years)	2,131	1,055	1,076	554	1,577
Interview response rate (10-14 years)	80%	81%	79%	79%	80%
Eligible for blood draw (18 months-14 years)	6,302	3,196	3,106	1,682	4,620
Blood draw response rate (18 months-14 years)	69%	69%	69%	63%	71%

\*Unweighted percentages

Of 16,383 eligible persons aged 15-64 years, 13,720 (84%) completed adult interviews. Response rates for adult interviews were higher among women (89%) compared to men (77%). Response rates for blood draw were similar among women and men (85% vs. 84%). Urban residents were less likely to provide a blood specimen compared to rural residents (81% vs. 87%). There were a total of 2,131 children aged 10-14 years eligible for an interview; of those, 80% completed interviews. The blood response rate for all children aged 18 months to 14 years was 69%.

The expected survey response rate was 90% based on the response rates from KAIS 2007. Although the survey response rate for KAIS 2012 was lower than the expected response rate, it was still large enough to provide regional and national estimates with a high level of precision.

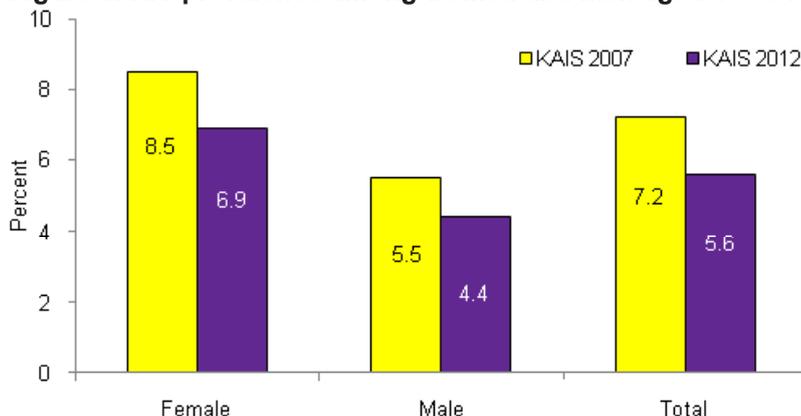
### 3.2 Prevalence of HIV

**Prevalence of HIV among Children:** Overall, 0.9% of children aged 18 months to 14 years were infected with HIV. This corresponds to an estimated 104,000 children infected with HIV nationwide. Note that this estimate does not include children younger than 18 months of age and children in North Eastern region.

**Prevalence of HIV among Adults:** In total, 5.6% of adults aged 15 to 64 years were infected with HIV. This corresponds to approximately 1,192,000 persons living with HIV infection in 2012. In contrast, KAIS 2007 estimated a HIV prevalence of 7.2%. These estimates do not include adults in the North Eastern region.

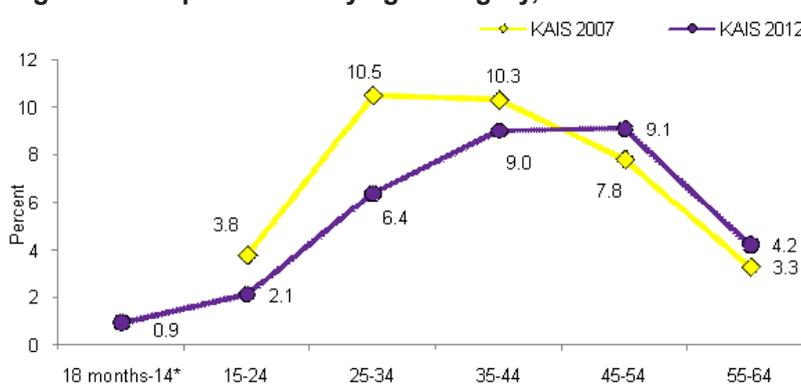
**Sex:** A higher proportion of women aged 15 to 64 years (6.9%) than men (4.4%) were infected with HIV (Figure 1). This pattern was similar to what was observed in KAIS 2007. Overall decreases in HIV prevalence were observed between 2007 and 2012 among both women and men.

**Figure 1: HIV prevalence among women and men aged 15 - 64 years, KAIS 2007 and 2012**



**Age:** There were differences in HIV prevalence across age groups (Figure 2). HIV prevalence increased with increasing age, with the highest prevalence among adults aged 45-54 years. Prevalence fell sharply among those aged 55-64 years. In KAIS 2007, prevalence was highest in the 25-34 year age category.

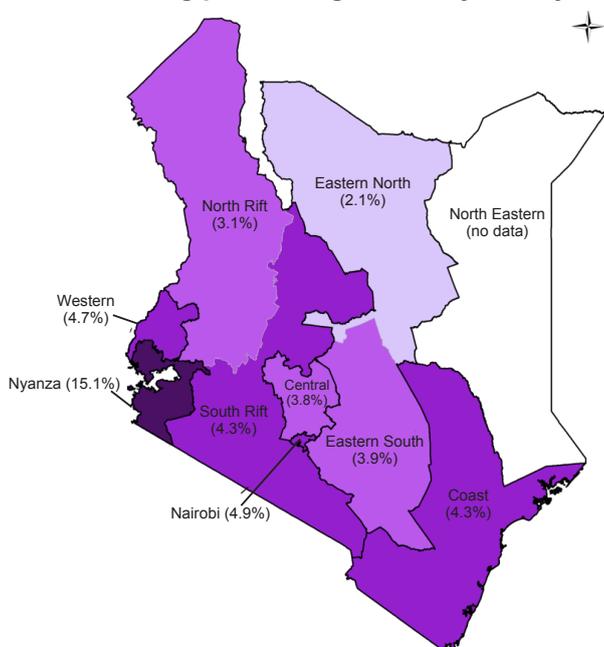
**Figure 2: HIV prevalence by age category, KAIS 2007 and 2012**



\*18 months to 14 year age category not included in KAIS 2007.

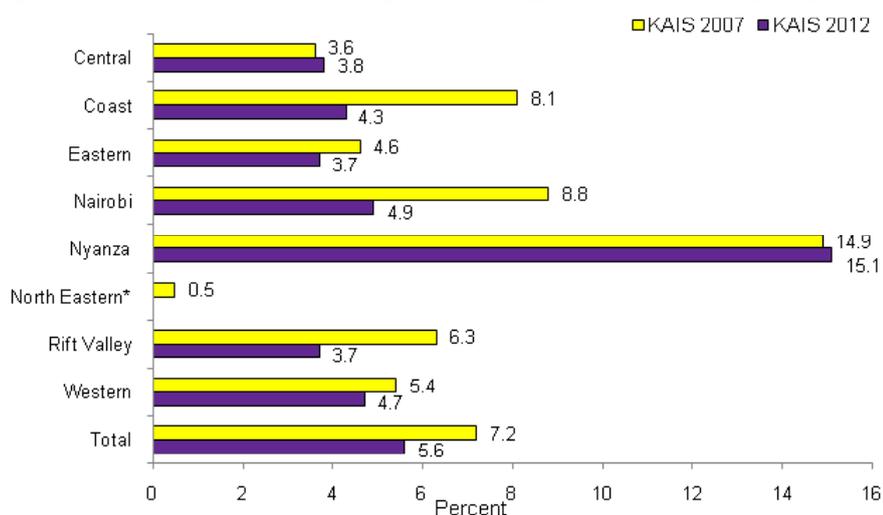
**Geography:** The distribution of HIV infections varied across the country (Figure 3). Prevalence was highest in the Nyanza region at 15.1% and lowest in the Eastern North region at 2.1%.

**Figure 3: HIV prevalence among persons aged 15-64 years by NASCOP region, KAIS 2012**



Substantial decreases in prevalence from KAIS 2007 were noted in Nairobi (-44%), Coast (-47%), and Rift Valley (North and South Rift) at -41% (Figure 4).

**Figure 4: HIV prevalence among persons aged 15-64 years by region, KAIS 2007 and 2012**

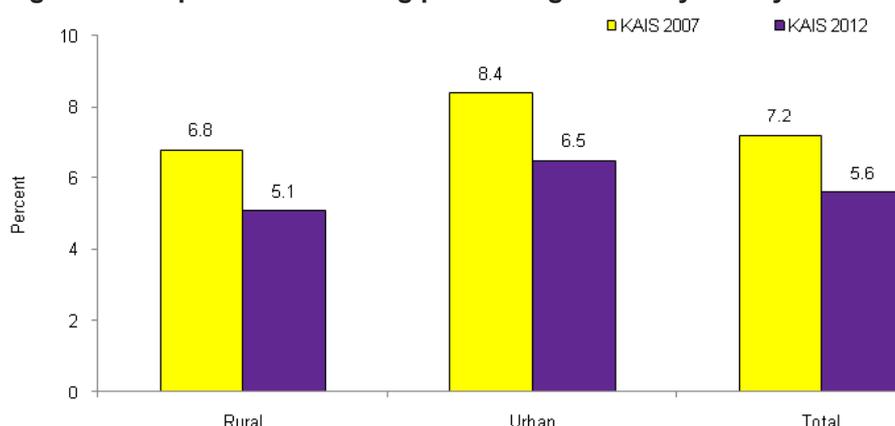


\*North Eastern region not surveyed in KAIS 2012.

**Residence:** Slightly less than two-thirds (65%) of adults lived in rural areas of the country at the time of the survey. HIV prevalence was higher in urban areas (6.5%) than in rural areas (5.1%) (Figure 5).

Women aged 15-64 years were more likely to be infected with HIV than men in both urban and rural areas, with 8.0% of urban females infected compared to 5.1% of urban males, and 6.2% of rural women infected compared to 3.9% of rural men. Compared to KAIS 2007, HIV prevalence for both rural and urban areas was lower in KAIS 2012.

**Figure 5: HIV prevalence among persons aged 15-64 years by residence, KAIS 2007 and 2012**



**Education:** HIV prevalence was higher among women than men at all education levels (Table 4). HIV prevalence was lowest among both women and men with no primary education (4.0% and 2.4% respectively).

**Marital Status:** HIV prevalence varied by marital status (Table 4). Both women and men who reported that they were widowed had high HIV prevalence (20.3% and 19.2% respectively). Those who reported they had never married or cohabited had the lowest HIV prevalence (2.7% and 1.3%, respectively).

**Table 4: HIV prevalence among persons aged 15-64 years by sex, education level, and marital status, KAIS 2012**

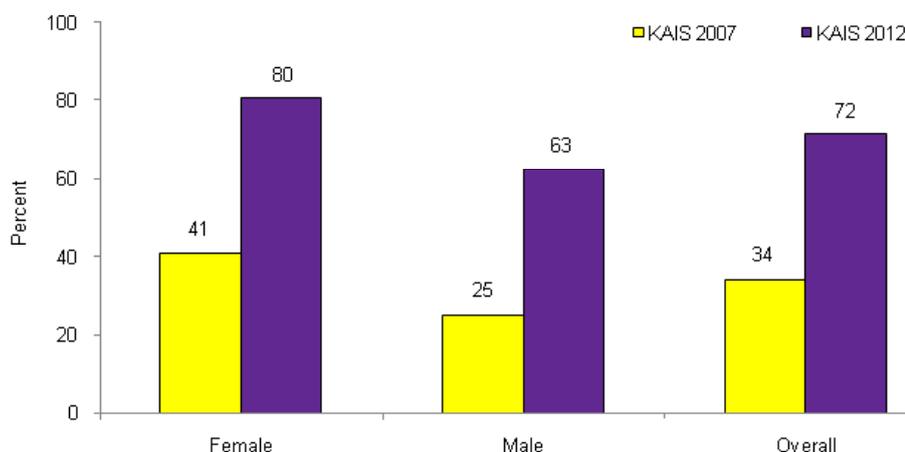
	Women % (95% CI)	Men % (95% CI)	Total % (95% CI)
<b>Education Level</b>			
No primary	4.0 (2.5-5.5)	2.4 (0.4-4.4)	3.6 (2.4-4.8)
Incomplete primary	6.3 (3.7-8.9)	3.2 (1.1-5.3)	5.0 (3.2-6.7)
Complete primary	7.1 (5.9-8.3)	4.8 (3.3-6.2)	6.0 (4.9-7.0)
Secondary+*	7.4 (6.3-8.5)	4.4 (3.4-5.4)	5.8 (4.9-6.7)
<b>Marital Status</b>			
Never married/never cohabited	2.7 (1.8-3.6)	1.3 (0.7-1.9)	1.8 (1.3-2.3)
Currently married/currently cohabiting	5.3 (4.4-6.2)	5.3 (4.2-6.4)	5.3 (4.4-6.2)
Separated/divorced	14.5 (11.1-17.9)	5.4 (2.3-8.6)	11.0 (8.4-13.4)
Ever widowed	20.3 (16.1-24.4)	19.2 (12.3-26.0)	20.0 (16.2-23.7)

\*Secondary+ education includes any years of secondary schooling whether completed or not.

### 3.3 Use of HIV Prevention Services

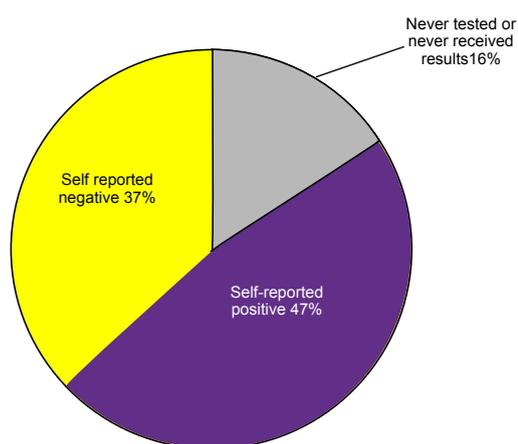
**HIV Testing:** Testing for HIV is important for HIV prevention and is necessary to receive HIV care and treatment services. Overall, 72% of adults aged 15-64 years reported having ever been tested for HIV, a marked increase from 34% in KAIS 2007 (Figure 6). There were differences in the proportion tested by sex, with women more likely to have ever been tested than men (80% vs. 63%). Among testers, the majority (56%) had been tested in the previous 12 months, 67% had tested more than once in their lifetime and 35% had ever been tested for HIV with a sexual partner.

**Figure 6: HIV testing among persons aged 15-64 years by sex, KAIS 2007 and 2012**

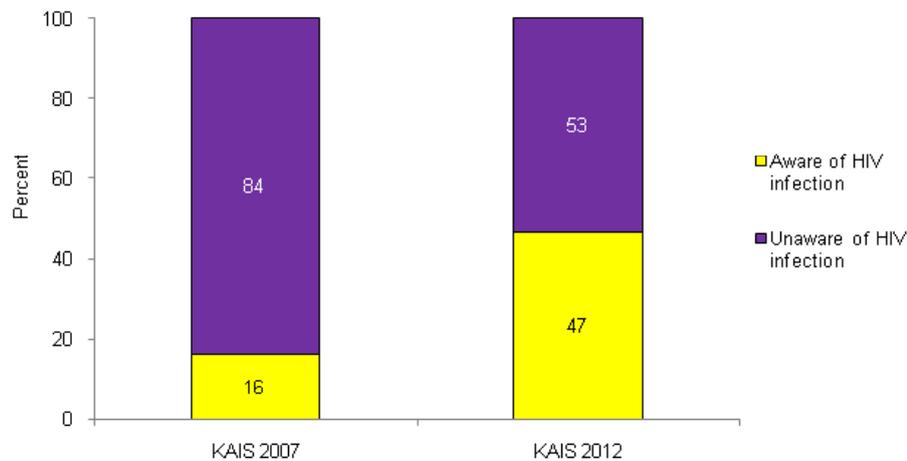


**Knowledge of HIV Status among Persons with HIV:** Among HIV-infected persons, the proportion that correctly self-reported their HIV status as HIV positive was 47%, whereas 37% self-reported their HIV status as negative and 16% had never been tested for HIV or had tested but never received their test results (Figure 7). The proportion of HIV-infected persons who were aware of their HIV positive status tripled from 16% in 2007 to 47% in 2012 (Figure 8).

**Figure 7: Self-reported HIV status among HIV-infected persons aged 15-64 years, KAIS 2012**

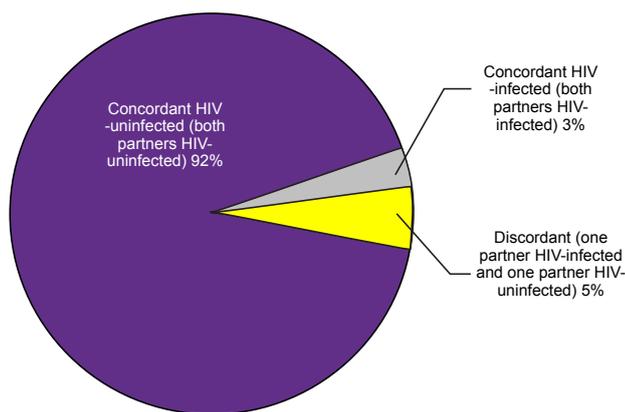


**Figure 8: Awareness of HIV status among HIV-infected persons aged 15-64 years, KAIS 2007 and 2012**



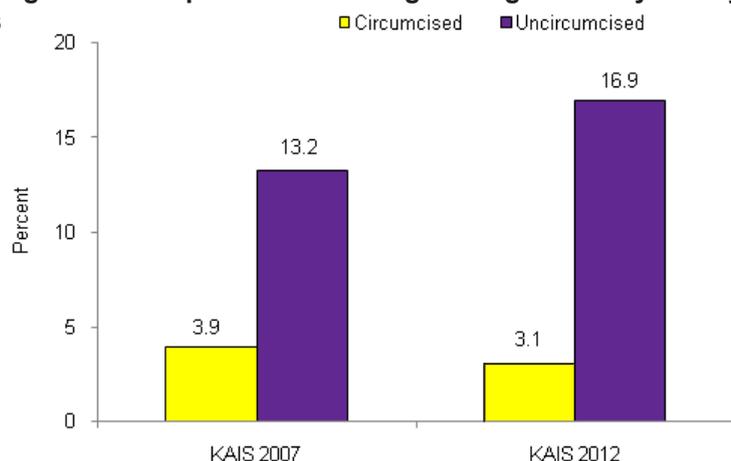
**Couples:** Of 4,226 married or cohabiting couples in KAIS 2012, 2,032 (47%) had HIV test results from NHRL for both partners, 1,473 (35%) had HIV test results for only one partner and 721 (18%) did not have HIV results for either partner. Of those couples where both partners had HIV test results, 92% were concordantly HIV-uninfected (both partners HIV-uninfected), 3% were concordantly HIV-infected (both partners HIV-infected), and 5% had discordant HIV status (one partner HIV-uninfected and one partner HIV-infected) (Figure 9). These data are comparable to KAIS 2007 which showed that among couples where both partners had NHRL HIV test results, 90% were concordantly negative, 4% were concordantly positive, and 6% were discordant. In couples where at least one partner was HIV-infected, 39% were concordantly infected and 61% were discordant. This corresponds to an estimated 260,000 couples that were HIV discordant in 2012.

**Figure 9: HIV concordance and discordance among married or cohabiting couples aged 15-64 years, KAIS 2012**



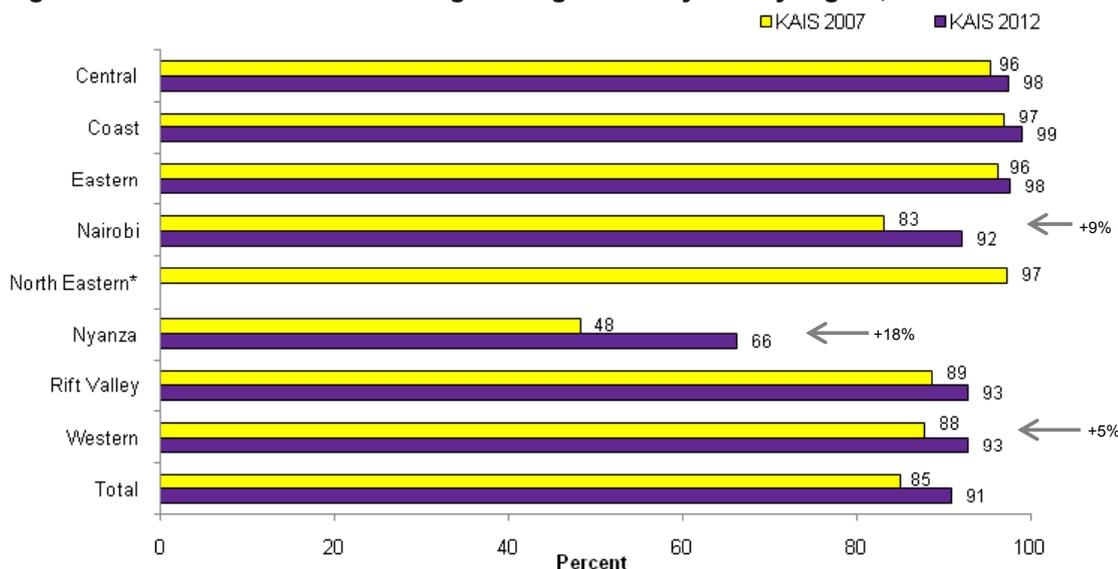
**Male Circumcision:** Circumcised men have a lower risk of acquiring HIV infection. In both KAIS 2007 and KAIS 2012, the prevalence of HIV infection among circumcised men was relatively low compared to uncircumcised men. In 2012, HIV prevalence was five times higher in uncircumcised than in circumcised men (Figure 10).

**Figure 10: HIV prevalence among men aged 15-64 years by male circumcision status, KAIS 2007**



The proportion of men who were circumcised increased from 85% in KAIS 2007 to 91% in KAIS 2012 (Figure 11). All regions observed increases in the proportion of men circumcised, with the largest increases seen in Nyanza region, from 48% to 66% and in Nairobi region, from 83% to 92%, both of which include traditionally non-circumcising communities. Although the North Eastern region was not surveyed in KAIS 2012, in 2007 over 97% of men in this region were circumcised.

**Figure 11: Male circumcision among men aged 15-64 years by region, KAIS 2007 and 2012**



\*North Eastern region not surveyed in KAIS 2012.

**Sexual Behaviour:** Among young adolescents aged 12 to 14 years, 7% reported ever having sex, with a median age at first sex reported at 10 years (interquartile range: 9-12 years) (Table 5). Among young adults aged 15 to 24 years, 66% of women and 59% of men ever had sex. Of those, 21% had reported sexual debut before 15 years of age, compared to 25% in KAIS 2007. Among sexually-active persons aged 15-24 years, 4% of women and 30% of men reported multiple sexual partners (2 or more partners) in the past 12 months; 57% of women and 38% of men reported that they were aware of their sex partners' HIV status, and 11% of women and 43% of men reported consistent condom use with partners of unknown or discordant HIV status. Among sexually-active persons aged 25-64 years, 3% of women and 17% of men reported having more than one sexual partner in the past 12 months; 48% of women and 61% of men were aware of the HIV status of their partners, and 5% of women and 14% of men reported using condoms consistently with partners of unknown or discordant HIV status.

**Table 5: Sexual behaviour among respondents by age group, KAIS 2012**

	12-14 years	15-24 years		25-64 years	
		Women	Men	Women	Men
Ever had sex	7%	66%	59%	99%	99%
Median age at first sex, years (interquartile range)	10 (9-12)	17 (15-18)	16 (14-18)	18 (15-20)	18 (16-20)
Sexually-active in the past 12 months among persons who have ever had sex	--	85%	74%	78%	89%
Reported two or more sex partners in the past 12 months	--	4%	30%	3%	17%
Aware of HIV status of sex partners in the past 12 months	--	57%	38%	48%	61%
Condoms used consistently with partners of discordant or unknown HIV serostatus in the past 12 months	--	11%	43%	5%	14%

**Key Populations at High Risk of HIV Infection:** The Kenya Modes of Transmission study in 2006 reported that one of three HIV transmissions was attributed to certain populations that engage in high HIV risk behaviours [6]. In KAIS 2012, the proportion of respondents reporting high-risk sexual and drug-using behaviour was low: 0.1% persons reported ever injecting drugs and one percent of men reported ever having sex with another man (Table 6). Three percent of men reported a history of engaging in transactional sex, where money, gifts or favours were received in exchange for sex, whereas four percent of women reported ever engaging in transactional sex. In contrast, the proportion of men who had given money, gifts or favours in exchange for sex was higher, with 17% of men reporting that they had ever engaged in this behaviour and five percent reporting they had done so in the last 12 months.

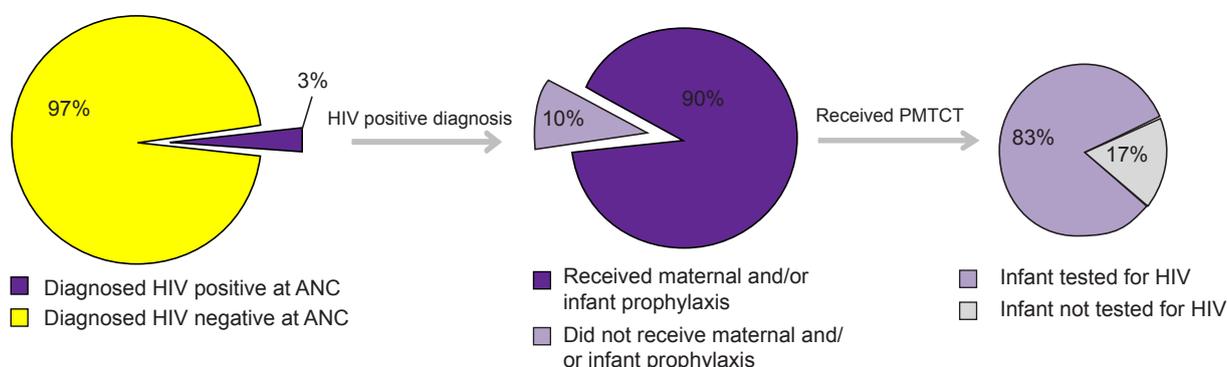
**Table 6: National percentage of key populations at high risk for HIV infection, men and women aged 15-64 years, KAIS 2012**

High-risk population	Ever	In the last 12 months
Persons who had ever injected drugs	0.1%	--
Men who had ever had sex with men	1%	--
Men who had received money, gifts, or favours in exchange for sex	3%	1%
Women who had received money, gifts, or favours in exchange for sex	4%	1%
Men who had given money, gifts, or favours in exchange for sex with women	17%	5%

### 3.4 Prevention of Mother-to-Child Transmission (PMTCT) of HIV

In KAIS 2012, among women aged 15-54 years who reported a live birth within the past five years (2007-2012), 96% attended an antenatal clinic (ANC) during their pregnancy, and 92% of those who attended ANC were tested for HIV as part of their antenatal care. In contrast, in KAIS 2007, 65% of women who reported a birth within the past five years (2002-2007) had been tested for HIV as part of antenatal care. Among the women who reported testing for HIV at ANC in KAIS 2012, 3% self-reported HIV positive, and of those, 90% received a PMTCT intervention, either maternal or child prophylaxis or both (Figure 12). 83% of infants born to women who received a PMTCT intervention were tested for HIV by their first immunization visit, and 16% of all the infants tested were reported by their mothers to be HIV-infected.

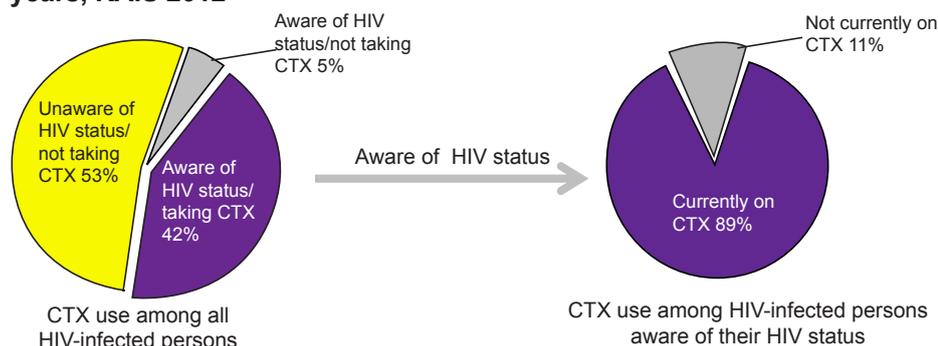
**Figure 12: Use of PMTCT and infant HIV testing among women aged 15-54 years diagnosed with HIV during their pregnancy who reported a live birth in the last 5 years, KAIS 2012**



### 3.5 Use of HIV Care and Treatment Services

**Use of Co-trimoxazole among HIV-infected persons aged 15 to 64 years:** It is recommended that everyone diagnosed with HIV take CTX, an antibiotic that reduces the risk of early mortality and rates of hospitalisation, malaria, diarrhoea, and pneumonia [4]. Use of CTX among those aware of their HIV infection was high at 89% (Figure 13). This was an increase from 2007, where CTX use was 76% among HIV-infected persons who were aware of their HIV infection.

**Figure 13: Use of Co-trimoxazole coverage and access among HIV-infected persons aged 15-64 years, KAIS 2012**



**Antiretroviral therapy use among HIV-infected persons aged 15 to 64 Years:** Current national guidelines recommend ART in all HIV-infected adults and adolescents with a CD4+ T-cell count  $\leq 350$  cells/ $\mu$ l or with WHO stage III or IV disease, such as co-infection with tuberculosis [4]. Among HIV-infected persons aged 15-64 years who had CD4+ T-cell counts done as part of KAIS 2012, 58% met the CD4+ T-cell count threshold for ART initiation (Figure 14a), and of those, 63% reported current use of ART (Figure 14b). Among all HIV-infected persons aged 15 to 64 years who were aware of their infection and eligible for ART, 88% were on ART (Figure 14c).

**Figure 14: Use of ART among HIV-infected persons aged 15-64 years by ART eligibility\* KAIS 2012\*\***

Figure 14a. All persons living with HIV

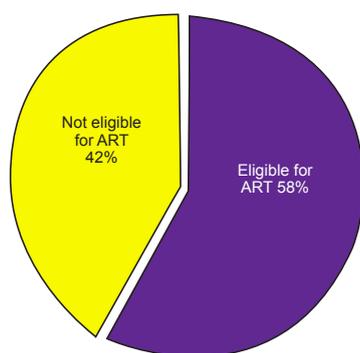


Figure 14b. All persons living with HIV and eligible for ART

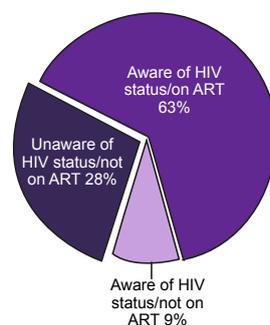
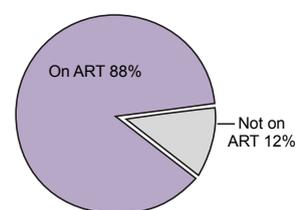


Figure 14c. All persons eligible for ART and aware of HIV positive status

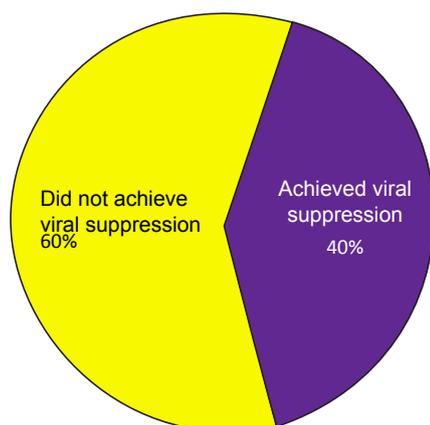


\*Eligibility is defined as CD4 $\leq$ 350 cells/ $\mu$ L, having ever been on ART or currently being treated for tuberculosis.

\*\*Data represent HIV-infected individuals who had a CD4+ T-cell count test done in KAIS 2012 laboratory testing.

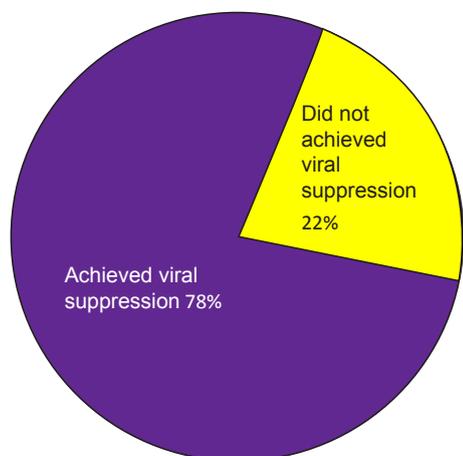
**Viral Suppression:** ART is considered to be successful if HIV-infected persons on ART have achieved and sustained viral suppression. Among all HIV-infected persons aged 15-64 years, 40% had achieved viral suppression (Figure 15). However, among HIV-infected persons on ART, viral suppression was achieved in 78%, similar to levels observed in developed countries (Figure 16).

**Figure 15: Viral suppression\* among HIV-infected persons aged 15-64 years, KAIS 2012**



\*Viral suppression is defined as HIV RNA concentration  $< 1,000$  copies/mL.

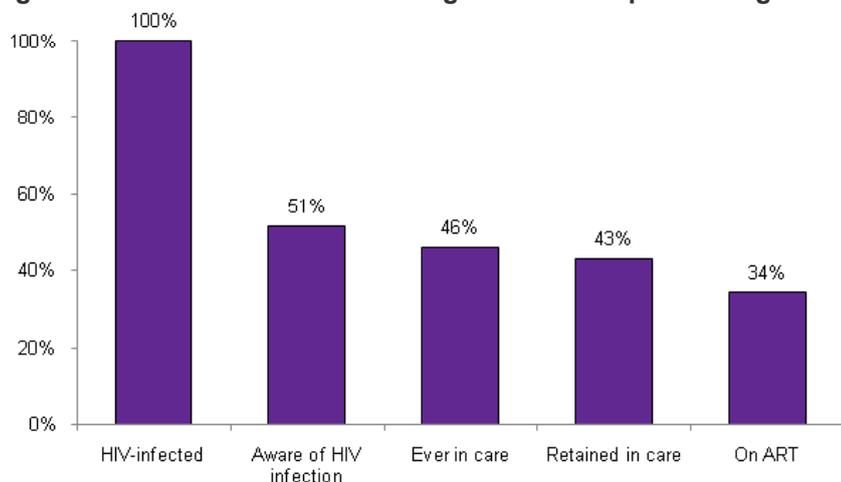
**Figure 16: Viral suppression\* among HIV-infected persons aged 15-64 years on ART, KAIS 2012**



\*Viral suppression is defined as HIV RNA concentration <1,000 copies/mL.

**Continuum of Care among HIV-infected Persons Aged 15 to 64 Years:** Although use of HIV-related care was high among those aware of their HIV positive status, only 43% of HIV-infected persons aged 15-64 years were diagnosed with HIV infection and retained in care. This gap in HIV care among HIV-infected persons highlights the importance of knowing one’s HIV status for seeking HIV care services.

**Figure 17: Continuum of care among HIV-infected persons aged 15 to 64 years, KAIS 2012\***



\*The HIV-infected bar represents individuals with a positive HIV test result from KAIS 2012 laboratory testing or individuals who self-reported HIV positive status.

**HIV Care and Treatment among HIV-infected Children:** Among HIV-infected children aged 18 months to 14 years, 41% were reported to have been diagnosed with HIV infection prior to KAIS 2012. Among these, 100% were currently receiving HIV-related care services. Of those children receiving HIV-related care services, 100% were on CTX, and 71% were on ART. Among those on ART, 40% had achieved viral suppression.

## NEXT STEPS

### 4.1 Dissemination of Final Results

This report summarizes the key preliminary findings from KAIS 2012. The final KAIS 2012 report, anticipated for release in December 2013, will offer a broader picture of the status of HIV in Kenya through a comprehensive look at all indicators included in the KAIS 2012 questionnaires and results from biologic testing. These include:

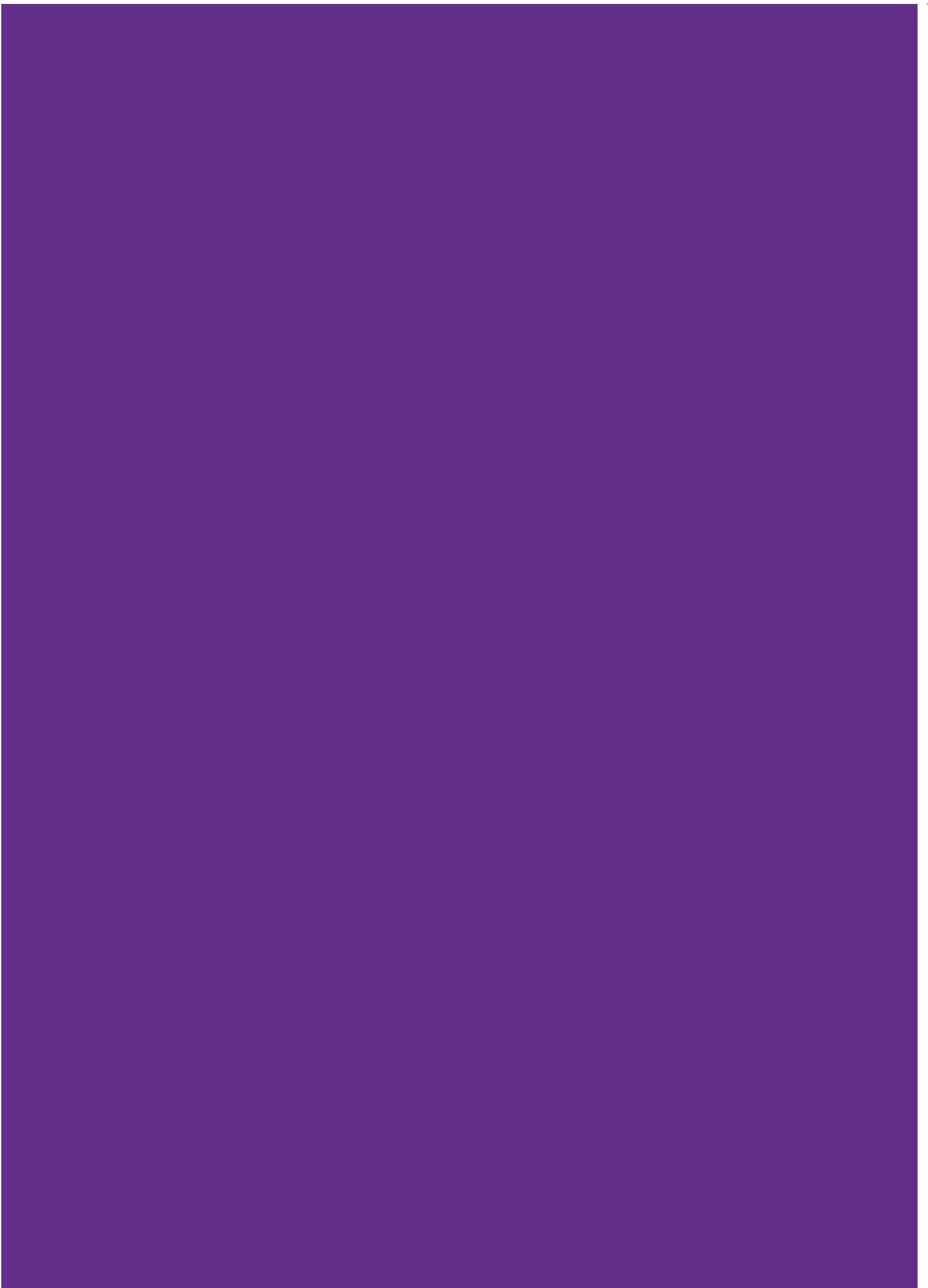
- HIV prevalence, HIV incidence, and trend analyses
- Impact of HIV on children, including orphans and vulnerable children
- Tuberculosis and co-infection with HIV
- Sexual partnerships and reproductive health

The final KAIS 2012 report will be released to the public and institutional stakeholders through a series of national and regional dissemination events. Additionally, fact sheets and policy briefs about each region and selected target groups, such as youths and older adults, will be available through the Government of Kenya partners and online at [www.nascop.or.ke](http://www.nascop.or.ke); [www.health.go.ke](http://www.health.go.ke); and [www.nacc.or.ke](http://www.nacc.or.ke).

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