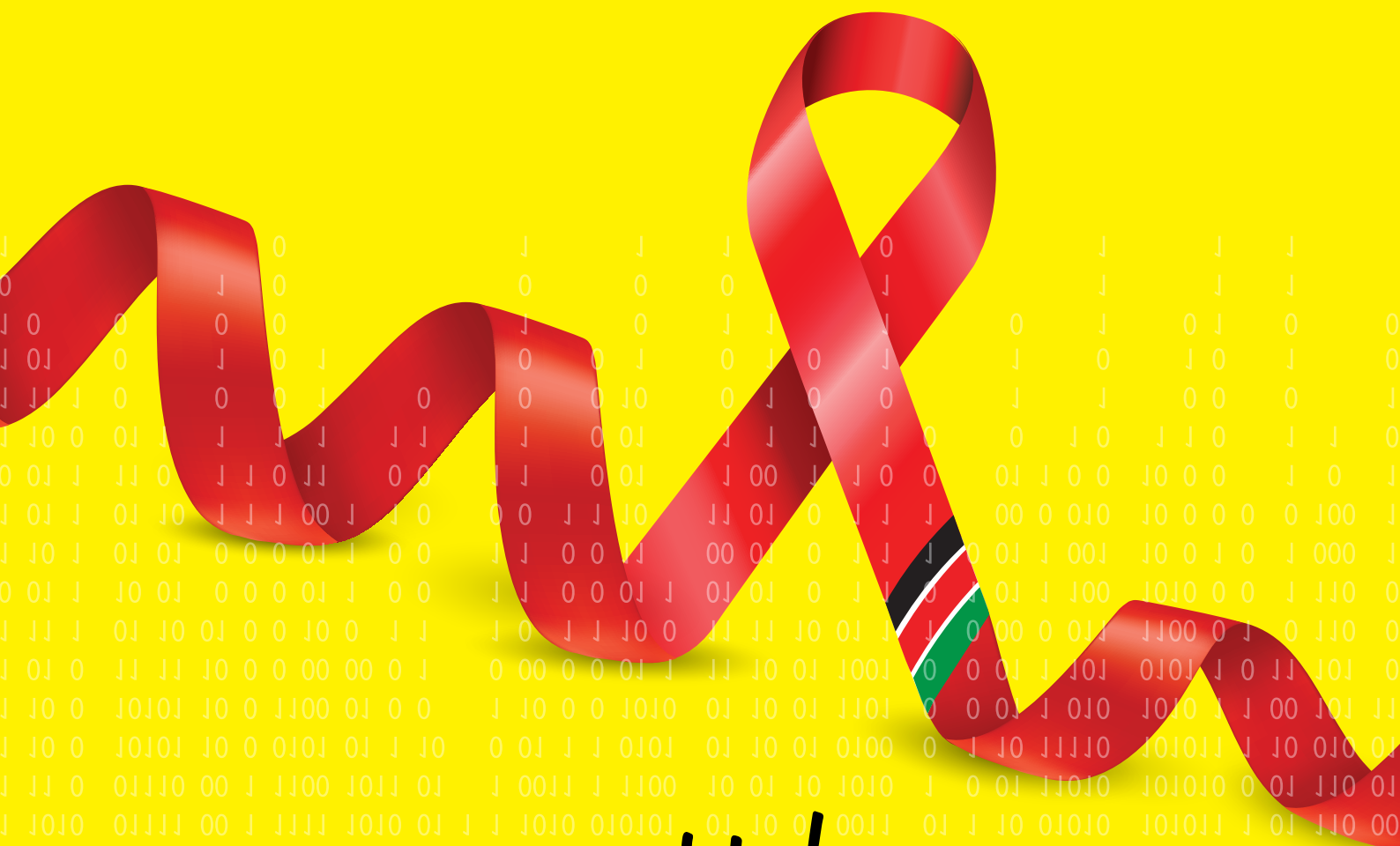




Ministry of Health

KENYA HIV ESTIMATES

REPORT 2018



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National AIDS Control Council

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Ministry of Health

KENYA HIV ESTIMATES

REPORT 2018



National AIDS and STI
Control Programme

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October 2018

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Foreword



The Ministry of Health has adopted an evidence-informed approach for advocacy, planning, and budgeting at the National and County levels for the HIV and AIDS response. Understanding trends in the HIV epidemic and the burden in different counties is an important step in this approach. The successful implementation of the HIV prevention and treatment programme has shown positive results, with Kenya's 2017 HIV estimates clearly indicating a decline in the trajectory of the HIV epidemic.

This 2018 HIV Estimates Report aims to provide an improved understanding of the HIV epidemic in Kenya, and offers important insights into the impact of various interventions. The estimates have been derived from many important data sources and benefit from national consultation and review with key stakeholders from the government, national and international organizations. The highlights of this report include a gradual decline in adult HIV incidence to an estimated 0.19% in 2018. When prevention programs achieve heightened awareness, significant changes in behaviour will occur. This is expected to lead to a significant reduction in the need for PMTCT services, as well as a reduction in the number of new HIV infections. There is therefore an urgent need to scale up prevention programmes in an effort to continue reducing HIV incidence. A positive outcome of treatment scale up is the reduction in mortality, and a corresponding reduction

in the number of AIDS orphans. Although prevalence has modestly decline to about 4.9%, a combination of increased awareness, scale up of prevention and treatment programs will lead to a sustained decline of HIV prevalence in Kenya. However, the wide geographic variation in HIV burden directs us to redouble our efforts and commitment to further reduce the burden of HIV and AIDS.

In this regard the Ministry of Health has put in place frameworks complete with accompanying policies to ensure that HIV and AIDS Response is comprehensively addressed. These include the Kenya Health Sector Strategic and Investment Plan which has captured critical indicators on HIV and AIDS. The Kenya Health Policy, 2014–2030 gives directions to ensure significant improvement in overall status of health in Kenya in line with the Constitution of Kenya 2010, the country's long-term development agenda, Vision 2030 and global commitments including those on HIV to ensure that the country attains the highest possible standards of health. This is energized by the current efforts towards Universal Health Coverage, one of the big four development agenda in which HIV and AIDS is also catered for.

The HIV Estimates were developed by the HIV Estimates Task Team with experts from different institutions under the overall coordination and leadership of the National AIDS Control Council. I give particular thanks all the experts from these institutions. I am sure that this report will be useful to programme managers, epidemiologists and researchers across the country.

A handwritten signature in black ink, appearing to read 'Peter K. Tum'.

Peter K. Tum, OGW

Principal Secretary, Ministry of Health

Preface



The National AIDS Control Council in consultation with national and international epidemiologists, demographers, public health experts and monitoring and evaluation specialists undertake an annual exercise to estimate the HIV burden in the country. Avenir Health and UNAIDS continue to provide technical support to this process. The estimates are based on data from Kenya Demographic Health Surveys, Kenya AIDS Indicator Surveys, HIV Sentinel Surveillance among pregnant women, data from programmes and the national census. The estimates use the Estimation and Projection Package and Spectrum tools as recommended by the UNAIDS Reference Group on Estimates, Modelling and Projections.

The HIV Estimates bring forth a sound reflection on the existing nature of HIV burden and trajectory of the HIV epidemic in the form of prevalence, new infections, AIDS orphans and related deaths. With



Kenya has succeeded in reducing the epidemic through focused interventions. However, a third of the Counties contribute 75% of the total national new HIV infections, and some Counties have hyper-endemic prevalence levels that compare to southern African countries.



adult (15-49 years) HIV prevalence estimated at about 4.9% in 2017 and approximately 1.5 million people living with HIV, Kenya has succeeded in reducing the epidemic through focused interventions. However, a third of the Counties contribute 75% of the total national new HIV infections, and some Counties have hyper-endemic prevalence levels that compare to southern African countries. The details of these and other indicators are provided in this report. The robust estimates generated for Kenya and its 47 Counties are a rich resource for county level planning, estimating the resource needs and developing strategies for scaling up high impact interventions.

Although Kenya's progression in the AIDS response is unambiguous, the gains need to be capitalised.

Kenya must sustain its efforts and move forward in achieving national and international targets. Considering the varied nature of the epidemic across the counties, and endeavouring to implement a range of essential HIV programmes on a population wide scale based on a sound evidence base, can Kenya meet the challenge of realising zero new infections?

In order to achieve this goal and free future generations from AIDS, we require leadership, political commitment, civil society participation, knowledge capital generation, financial resources, innovations in developing new and affordable medicines and preventive technologies. We also need to tackle the fundamental drivers of the epidemic, particularly gender inequality, poverty, stigma and discrimination in family and health service settings. Doing so, will ensure we achieve our goals.

Angeline Yiamiton Siparo

Chairperson, National AIDS Control Council

Acknowledgement



It is with pleasure that we launch the 2018 Kenya HIV Estimates Report; a product of hard work, resilience, and renewed commitment to ending AIDS by 2030. The 2017 Kenya HIV Estimates Report seeks to provide insight into the HIV epidemic in Kenya, and offers critical input into the impact of key interventions. The Report has been developed through concerted efforts of a multi-sectoral team, guided by the requisite legal framework, and in line with best practice.

The National AIDS Control Council wishes to acknowledge and appreciate the contribution of the Strategic Information Working Group who include; The National AIDS Control Council (NACC); National and STIs Control Program (NASCO); Health Management Information Systems (HMIS); Kenya National Bureau of Statistics (KNBS); Kenya's Universities (KU, UON, Strathmore); United Nations Programme on HIV and AIDS (UNAIDS); United Nations Children Fund (UNICEF); World Health Organization (WHO); the U.S. Centres for Disease Control and Prevention (CDC), Kenya AIDS NGOs Consortium (KANCO); National Empowerment Network of People Living with HIV/AIDS in Kenya (NEPHAK); University of California South Francisco (UCSF – Global Programs) and Africa Health Foundation (AHF) among others.

We give special thanks to the core members of the HIV Estimates Task Team members involved in the estimates process. Joshua Gitonga and Kennedy Mutai from NACC; Dr Joyce Wamicwe and Dorcas Mangoli from NASCOP; Henry Damisoni from UNAIDS; Richard Banda from WHO; Peter Young, Dr Davis Kimanga, and Dr Samwel Mwalili from CDC, Dr Nelson Owuor from UON, Dr Winnie Mutuku from KU, Felix Humwa and Agnes Natukunda from UCSF, Wellington Mbithi from UNICEF, Leonard Yosi from KEMSA, Dorothy Mutemi from AHF.

We also wish to acknowledge the consultant Dr Charles Oyaya and his support team including Fred Opundo, Mary Warinda, Bryan Tumwa, Mercy Oyaya and Evelyn Makena for compiling the report and Peter Cheseret for design. We extend our appreciation to John Stover from Avenir Health and Jeff Eaton of Imperial College London for their guidance and technical support, and UNAIDS for their financial and technical support during this process.

My special appreciation goes to Mr Joshua Gitonga and Dr Joyce Wamicwe for their contributions in coordinating the Strategic Information Working Group and disseminating the results.

Dr. Nduku Kilonzo

Chief Executive Officer, National AIDS Control Council

Executive Summary

The National HIV&AIDS estimates process, led by the Ministry of Health, is designed to describe the impact of the HIV and AIDS epidemic at national and county levels. It estimates HIV and AIDS prevalence and incidence, AIDS-related deaths, the impact of care and treatment on HIV and AIDS prevalence, and the number of pregnant women and children affected by HIV and AIDS and the current number of HIV and AIDS orphans.

The 2018 national and county HIV&AIDS estimates were generated using the Estimation and Projection Package (EPP) and Spectrum software recommended by the UNAIDS Reference Group on Estimates, Modeling and Projections. The software uses data collected from antenatal clinic surveillance, population based surveys including the Kenya AIDS Indicator Survey II (KAIS II) and HIV program data to estimate the prevalence of HIV and AIDS, and its impact on the population.

The 2018 estimates report presents updated HIV estimates for the calendar year 2017, the last year for which programme data were available. Because the data, methods and software are continuously evolving, the prevalence estimates from different reports are not directly comparable. Only the estimates produced by a single curve or model can be meaningfully compared to assess changes in HIV prevalence, and describe trends in the epidemic. This report presents trend data from 2000 to 2017 in the current EPP and Spectrum software.

For this report, two sets of estimates were prepared. The National estimates projected indicators for all of Kenya by fitting prevalence curves to surveillance and survey data for regions corresponding to the eight former provinces of Kenya. The County estimates produced separate data for each of the counties by disaggregating the regional prevalence curves using data from each county. The county estimates may be aggregated to produce National estimates.

Adult HIV Prevalence

In 2017, the National adult HIV prevalence rate was estimated at 4.9% with prevalence higher among women (5.2%) than men (4.5%). Although the Spectrum results show a continued decline in HIV prevalence among the adult population aged 15-49 years over a period of time, the decline has been modest since 2010. Kenya's HIV epidemic is geographically diverse, ranging from a prevalence of 21.0% in Siaya County in former Nyanza region to approximately 0.1% in Wajir County in former North Eastern region. In descending order, Counties with the highest adult HIV prevalence in 2017 included Siaya 21.0%; Homa Bay 20.7%; Kisumu 16.3%; Migori 13.3%; Busia 7.7%; Nairobi 6.1%; Vihiga 5.4%; Kitui 4.5%, Kakamega 4.5%; Kisii 4.4%, Tans Nzoia 4.3%; Muranga 4.2%; Nyamira 4.2%; Makueni 4.2%; Mombasa 4.1%; Taita Taveta 4.1%; and Kiambu 4.0%. . These new estimates confirm a decline in HIV prevalence among both men and women at both national and county levels.

National HIV
Prevalence**4.9%****4.5% | 5.2%**
184,718 males and females
aged 15 to 24 years living with HIV.

Counties with the highest adult HIV prevalence in 2018

COUNTY	PREVALENCE (%)	COUNTY	PREVALENCE (%)	COUNTY	PREVALENCE (%)
Siaya	21.0%	Vihiga	5.4%	Nyamira	4.2%
Homa Bay	20.7%	Kitui	4.5%	Makueni	4.2%
Kisumu	16.3%	Kakamega	4.5%	Mombasa	4.1%
Migori	13.3%	Kisii	4.4%	Taita Taveta	4.1%
Busia	7.7%	Tans Nzoia	4.3%	Kiambu	4.0%
Nairobi	6.1%	Muranga	4.2%		

Annual New HIV Infections in 2018

Approximately
52,800 new
infections across all ages

44,800 among
adults aged 15+ years and

8,000
among children
aged <14 years

HIV prevalence among males and females aged 15 to 24 years

National HIV prevalence among males and females aged 15-24 years was estimated at 1.34% and 2.61% in 2017 respectively, and overall HIV prevalence was 1.98%, which means 184,718 young adults living with HIV in 2017.

Annual New HIV Infections

In 2017 there were approximately 52,800 new infections across all ages; 44,800 among adults aged 15+ years and 8,000 among children aged <14 years

Of the estimated total new infections (52,800) in 2017, Nairobi contributed 7,159 new infections; Homa Bay (4,558); Kisumu (4,012); Siaya (4,039); and Migori (2,814). Together these counties contributed about 43% of the estimated total new infections and 38.0% of the new infections among children in 2017. For young people 15-24 years the following counties had more than 1,000 new HIV infections, Homa Bay (1,852), Kisumu

(1,630), Siaya (1,641), Migori (1,143), and Nairobi (2,587). Young women in the age group 15-24 accounted for a third of all new HIV adult infections.

Trends in HIV Incidence and New HIV Infections

Kenya has continued to see a sharp decline in HIV incidence among adults aged 15-49 from 0.35% in 2010 to 0.19% in 2017 possibly due to the scale up of various prevention and treatment programmes. In terms of absolute numbers, the new HIV infections among all ages declined from 77,200 in 2010 to 52,800 in 2017, indicating a 32% decline in the number of new annual HIV infections at national level, in spite of population growth. Annual new HIV infections among adult aged 15+ also declined from 63,700 in 2010 to 44,800 in 2017, a 30% decline. Among children, new infections declined from 13,500 in 2010 to 8,000 in 2017, which shows 41% decline over the period. Among young people aged 15-24 years, new infections



The PMTCT coverage is about
76%
in 2018.

declined from 28,800 in 2010 to 17,700 in 2017, which shows 39% decrease over the period.

Treatment Needs

While the number of adults aged 15+ in need of ART was 627,900 in 2010, the number in need of ART was estimated at 1,338,200 in 2017. Even so, it is important to note that the guidelines have changed over time to currently 'treat all' irrespective of CD4 counts or percent. During the period 2010-2017, the ART needs among children (0-14) rose from 88,600 in 2010 to 105,200 in 2017. If the country continues the scale up of prevention programmes, a positive outcome will be the reduction in need for PMTCT and child treatment. The number of HIV-positive pregnant women in need of PMTCT services in 2010 was 73,800. In 2017, approximately 69,500 HIV positive pregnant women required PMTCT services. The PMTCT coverage was about 77% in 2017. The decrease in the number of HIV+ pregnant women is likely to be a function of several factors; reduced transmission (incidence) in young women leading to an aging of the HIV-infected population into lower-fertility age groups and perhaps increased knowledge of status leading to better fertility choices.

Deaths averted/Lives Saved Due to ART

The adult ART coverage is estimated at 75% while the ART coverage for children is 82% in 2017. It is estimated that the scale up of ART since 2004 has saved over 635,500 lives in the country by the end of 2017 by averting deaths due to AIDS-related causes.

People Living with HIV

While the decline in HIV prevalence is encouraging, the total number of people living with HIV (PLHIV) in Kenya is estimated at approximately 1.5 million in 2017, this includes 105,200 children <15 years and 1,388,200 adults aged 15+. Children under 15 years of age account for 7% of all persons living with HIV. Of the total number of people living with HIV in 2017, 184,700 (12%) were among youth 15-24 years of age.

AIDS related deaths

These estimates highlight the declining trend of annual AIDS deaths in Kenya since 2005. Approximately 28,200 people died of AIDS related causes in 2017 compared to 53,900 in 2010, a 48% decline in the number of AIDS related deaths at national level over the period. The decline is directly attributable to the wider access to ART—made available with the roll out of free ART in 2003—and the ability of the National AIDS/STI Control Programme to cover treatment needs for HIV and AIDS, co-infections and provide care services. Children <15 years AIDS related deaths were estimated at 4,300 in 2017 down from 10,200 in 2010. There was also a drop in AIDS related deaths among all other age cohorts with the deaths among the adolescents (10-19 years) declining from 3900 in 2010 to 2,100 in 2017; young adults (15-24 years) from 3,600 in 2010 to 2,800 in 2017; and adults (15+ years) declining from 43,700 in 2010 to 23,900 in 2017. In spite of the significant progress, people living with HIV that are not on treatment are still at increased risk of mortality, and continued efforts

are needed to ensure everyone who is infected accesses treatment.

Estimates of adult AIDS related deaths are based on several assumptions and additional datasets that include: estimates of the number of adults and children who are living with HIV, and estimates of survival from the time of infection to the time of death for both adults and children living with HIV, with or without treatment. AIDS deaths are estimated based on the latest global evidence on survival time, with and without treatment, and globally recognized methods and models are used to calculate this specific indicator.

Orphans and Vulnerable Children

The number of total orphans is estimated to have slightly declined from 2.3 million children in 2010 to 2.0 million orphans in 2017. The number of all AIDS orphans also declined from 998,000 children in 2010 to 581,400 in 2017.

A call to sustained action towards 'Zero New Infections, Zero AIDS-related deaths and Zero discrimination'

The evidence presented above shows that Kenya is on track to achieve the global targets of 'Zero New Infections, Zero AIDS-related deaths and Zero discrimination'. Sustaining prevention focus and intensity in the areas where significant declines in HIV incidence have been achieved is critical to consolidate these gains. Emerging epidemics must be addressed effectively, and prevention efforts intensified in high prevalence areas. With increasing treatment coverage

and a decline in AIDS-related deaths, a significant number of people are likely to require first and second line ART treatment in the coming years. A major challenge for the HIV programme will be to ensure that the treatment requirements of people living with HIV are fully met without sacrificing the needs of prevention or the quality of treatment programmes.

Conclusion

In conclusion, despite progress by Kenya in advancing towards National targets as reflected in the 2018 HIV estimates report, much remains to be done to halt and reverse HIV. In absolute terms, a large proportion of Kenya's population is infected with or affected by HIV. The spread of the epidemic must be halted, with zero new infections the principal target for epidemic control. The vision of eliminating the impact of the AIDS epidemic can be realized through scale up of evidence-based interventions such as PrEP, voluntary medical male circumcision. Improved strategic information, through improved surveillance of recent infections, treatment initiation, viral suppression, drug resistance, and deaths among people living with HIV can help programme planners better target interventions where they are most needed. Data presented through Kenya HIV Estimates Report 2018 should act as a primary step to catalyse continued action.



While the number of adults aged 15+ in need of ART was 627,900 in 2010, the number in need of ART was estimated at 1,338,200 in 2017.



Background

Kenya has a number of information sources for HIV prevalence levels and trends. Four national surveys, the Kenya Demographic and Health Survey of 2003¹ (KDHS 2003), the Kenya AIDS Indicator Survey 2007² (KAIS 2007), the Kenya Demographic and Health Survey of 2008/9³, the Kenya AIDS Indicator Survey 2012⁴ and the Kenya Demographic and Health Survey of 2014 provide good estimates of national prevalence and the trends between the years. Antenatal clinic surveillance has been conducted from 1990 to 2011, starting with 13 sentinel surveillance sites and expanding to 44 sites in the last round. Routine HIV testing among pregnant women at PMTCT sites has now reached high coverage and being used in the estimates process to inform national trends in HIV prevalence. The new estimates for 2017 are based on the four national surveys, sentinel surveillance data through 2011 and routine ANC data from 2013 through 2017.

Kenya produces annual estimates of HIV prevalence and key indicators. The last HIV Estimates Report 2018 was prepared in 2016⁵. This Kenya HIV Estimates Report 2018 aims to provide an improved understanding of the HIV epidemic in Kenya, and offers important insights into the impact of various



Routine HIV testing among pregnant women at PMTCT sites has now reached high coverage and being used in the estimates process to inform national trends in HIV prevalence.



interventions. The report describes the process used to prepare national estimates for 2017 and the results for key indicators and brings forth a sound reflection on the existing nature of HIV burden and trajectory of the HIV epidemic in the form of prevalence, new infections, AIDS orphans and related deaths. The estimates use the Estimation and Projection Package and Spectrum tools as recommended by the UNAIDS Reference Group on Estimates, Modelling and Projections.

¹ Central Bureau of Statistics (CBS) [Kenya], Ministry of Health (MOH) [Kenya], and ORC Macro. 2004. Kenya Demographic and Health Survey 2003. Calverton, Maryland" CBS, MOH and ORC Macro

² National AIDS and STD Control Programme, Ministry of Health, Kenya. July 2008. Kenya AIDS Indicator Survey 2007: Preliminary Report. Nairobi, Kenya.

³ KNBS [Kenya] 2009. Kenya Demographic and Health Survey 2008-09 Preliminary Report. Calverton, Maryland. KNBS, NACC, NASCOP, NPHLS, KEMRI, NCAFD, ICF Macro, September 2009.

⁴ National AIDS and STI Control Programme, Kenya AIDS Indicator Survey 2012, Preliminary Report, September 2013

⁵ National AIDS Control Council (NACC) and National AIDS & STIs Control Programme (NASCOP). Kenya HIV Estimates 2015. Nairobi, Kenya

Methods

The methods used to estimate national HIV prevalence in Kenya have changed over time in response to the data available. Before the first national survey, smooth prevalence curves were fit to individual surveillance sites to determine trends at those sites, and then these trends were aggregated by weighting them by the population represented by each site. When the first National survey became available the national trend was adjusted to match the survey findings in 2003⁶. Now that four surveys are available they can be used to adjust not only the level but also the trend in prevalence from 2003 to 2012. Over the years, there has been an increase in coverage and quality of routine testing data among pregnant women attending PMTCT sites. In 2017, the Kenya HIV Estimates Team evaluated the quality and completeness of routine ANC data and recommended the use of these data from 2013 onwards to adjust the trend of HIV prevalence. The national projection was validated by comparing the estimated total mortality with deaths estimates from vital statistics (adjusted for undercount) (Annex Figure 1) and by comparing the estimated age-specific prevalence with survey estimates (Annex Figure 2).

Annual fluctuations in surveillance and survey data are smoothed by fitting a curve to individual observations. Although the final curve may not be an exact match for the point estimates from any one survey, it should ideally lie within

the confidence bounds of all survey estimates.

UNAIDS has supported the development of a number of tools to make national estimates. For Kenya the relevant tools are the Estimation and Projection Package (EPP) and Spectrum (several years ago EPP was integrated directly into Spectrum package)^{7,8}. EPP is used to fit smooth prevalence curves to surveillance and survey data separately for the former eight regions (former provinces). The incidence implied by the regional prevalence curves is then transferred to Spectrum where it is combined with additional information on the age structure of incidence and program coverage (ART, PMTCT, cotrimoxazole for children) to estimate indicators of interest such as the number of people living with HIV, the number of new infections, AIDS deaths and the need for ART, PMTCT and cotrimoxazole. These regional estimates are then aggregated to create national figures.

Treatment need was derived by combining the estimated number of new adult HIV infections with information about progression in CD4 counts, the mother-to-child transmission rate and service statistics to estimate the need for services. For adult ART, eligibility for treatment was defined based on evolving national treatment guidelines as: a CD4 count of less than 200 cells/

⁶ National AIDS Control Council (NACC) and National AIDS and STD Control Programme (NAS COP) 2007. National HIV Prevalence in Kenya. Nairobi: NACC and NAS COP.

⁷ Stover J, Brown T, Marston M. Updates to the Spectrum/Estimation and Projection Package (EPP) model to estimate HIV trends for adults and children (2012) Sex Trans Infect 2012;88:ii11-ii16. doi:10.1136/sextrans-2012-050640

⁸ Futures Institute, AIM: A Computer Program for Making HIV/AIDS Projections and Examining The Demographic and Social Impacts of AIDS, Glastonbury, CT: Futures Institute, January 2014.

µl through 2006, less than 250 cells/µl from 2007-2009, CD4 count of less than 350 cells/µl in 2010-2014, CD4 count of less than 500 cells/µl in 2014-2016, and “treat all” irrespective of CD4 count from 2016 onwards⁹. Spectrum tracks adults living with HIV by CD4 count based on assumed rates of progression to lower CD4 counts, AIDS mortality by CD4 count and initiation of ART¹⁰. The parameters of the model were set to reproduce the CD4 count distribution of the population living with HIV who were not on ART, as reported by the 2012 KAIS (Annex Figure 3).

For children, eligibility has three different criteria: age, CD4 count and CD4 percent thresholds. The first is age (in months) by which all HIV positive children are eligible or started on ART. Again based on evolving national treatment guidelines, the recommend age thresholds have changed from 0 to 12 months in 2009, 24 months in 2012, 120 months in 2014 and now “treat all” (180 months) from 2016 onwards. The second is, CD4 count by four age groups and by year based on WHO guidelines for the corresponding years. The third is CD4 percent by age based on WHO guidelines. Children are considered eligible for treatment if they meet any one of the three criteria¹¹. The child model in Spectrum follows children from HIV infection to death based on survival patterns, which are dependent on time of infection (peripartum, 6-12 months, 13-24 months, >24 months)¹².

Spectrum calculates the number of children infected through mother-to-child transmission using program data on the number of women receiving PMTCT services by regimen and timing of ART initiation among pregnant women, estimated breastfeeding patterns in the HIV-infected population, and the latest estimates of the probability of transmission for each scenario¹³.

There are uncertainties inherent in these estimates based on the error of measuring HIV prevalence through population surveys and the uncertainty in the assumptions used for time of progression, the distribution of new infections by age and sex, mother-to-child transmission rates, and the effectiveness of treatment. In order to quantify this uncertainty, Spectrum performs 1000 Monte Carlo simulations using randomly selected values for these assumptions with ranges indicated by the sources as well as the uncertainty in incidence estimates estimated by EPP. The results provide plausibility bounds around each estimate.

To measure the impact of treatment in terms of lives saved, we used Spectrum to compare this scenario to a hypothetical scenario in which no one was ever placed on ART. The difference in the number of AIDS deaths between the two projections is the estimated impact of treatment. A similar approach was used to measure the impact of PMTCT scale-up.

There were global changes in the child model structure with the adjustment applied to estimates for earlier years. New evidence from recent population-

9 Ministry of Health, National AIDS & STI Control Programme. Guidelines on Use of Antiretroviral Drugs for Treating and Preventing HIV Infection in Kenya 2016. Nairobi, Kenya: NASCOP, July 2016. Print.

10 Futures Institute, AIM: A Computer Program for Making HIV/AIDS Projections and Examining The Demographic and Social Impacts of AIDS, Glastonbury, CT: Futures Institute, January 2014.

11 Quick Start Guide for Spectrum 2018. UNAIDS, December 2017.

12 Futures Institute, AIM: A Computer Program for Making HIV/AIDS Projections and Examining The Demographic and Social Impacts of AIDS, Glastonbury, CT: Futures Institute, January 2014.

13 Rollins N, Mahy M, Becquet R, Kuhn L, Creek T, Mofenson L. Estimates of peripartum and postnatal mother-to-child transmission probabilities of HIV for use in Spectrum and other population-based models Sex Trans Infect 2012;88:i44-i51.

based HIV impact assessment (PHIA) surveys in three countries (Malawi, Zambia, Zimbabwe) suggested that estimated child prevalence was lower than empirical results¹⁴. Consequently, updates were done to the Spectrum model in 2017 to fully capture transmission from women who seroconvert during breastfeeding. In previous models, duration of risk of HIV incidence among breastfeeding women only lasted for 12 months; while in the revised model duration of risk of HIV incidence among breastfeeding women extended to full duration of breastfeeding. This results in more children becoming infected during breastfeeding, and consequently increase in new child HIV infections and children living with HIV.

In 2017, an update was introduced to Spectrum to allow adjustment on the percentage of women who were already on ART at the time they became pregnant or started ART during the current pregnancy who are still on ART at the time of delivery (a change from previous versions that used monthly drop-out rates). For 2018 estimates, we used an assumption of 85% retention rate based on results from the 2017 Cohort Analysis. The adjustment in retention rates results in increased MTCT rate (all other factors remaining constant) since women who dropout have a transmission rate of about 30% (similar to women with unknown HIV status/ women not on ART) compared to 2% for those on ART.

Like in 2016, this year a single set of regional projections were prepared. The regional estimates have been aggregated

to produce national estimates, and also used to disaggregate the regional indicators to the county levels.

County estimates of key indicators were prepared by disaggregating the regional total to the Counties within each region (former province). Separate Spectrum files were prepared for each region and prevalence trends were fit to surveillance and survey data. Population projections for each region were based on total fertility rates and mortality indicators from KDHS and adjusted to match census estimates by region.

For each of the key indicators the regional estimates were distributed to each county on the basis of that county's proportion of the total.

Estimates of prevalence by County were prepared by examining surveillance and survey cluster data from 2003 to 2017. For each County the prevalence trend was determined by one of five options: 1) overall average across all data points, 2) a linear trend fit to all data points, 3) the most recent value, 4) the latest KAIS estimate or 5) the latest KDHS estimate. The prevalence estimate for 2017 for each County was multiplied by the population 15-49 in the County to estimate the number of adults living with HIV aged 15-49. The number of adults living with HIV aged 15+ in each County was adjusted so that the total across all Counties in a province would equal the provincial total estimated by Spectrum. Values for other indicators were first distributed by County according to the number of HIV+ adults and then adjusted to match the regional totals.

¹⁴ Malawi, Zambia and Zimbabwe: PHIA surveys results. phia.icap.columbia.edu

Results

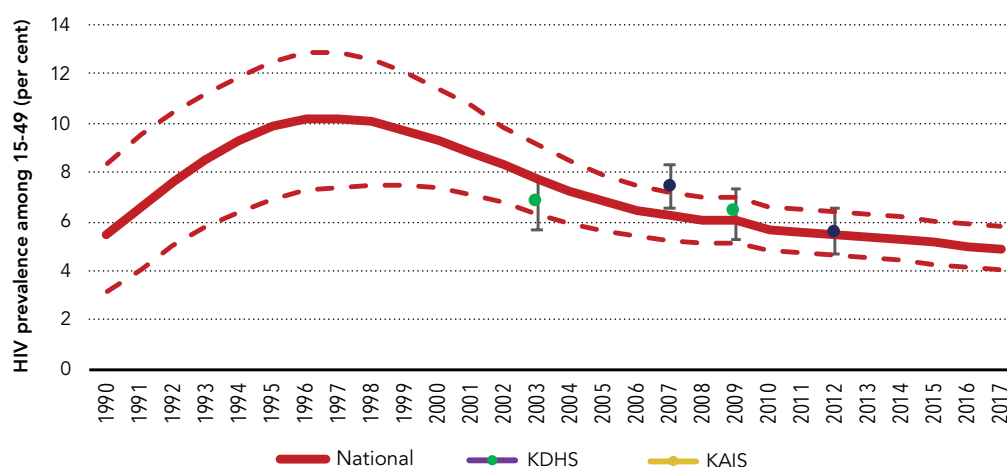
Table 1: National HIV estimates for 2017

Indicator	2017
People living with HIV (all ages)	1.5 (1.3 – 1.8) million
Annual new HIV infections (all ages)	52,800 (33,400 – 77,500)
Annual AIDS-related deaths (all ages)	28,200 (18,100 – 45,300)
HIV prevalence (adults aged 15-49)	4.85% (4.02 – 5.80%)
HIV incidence (adults 15-49)	0.19% (0.13 – 0.29%)
Adult 15+ living with HIV	1,388,200 (1,167,000 – 1,645,900)
Annual new HIV infections (Adult 15+)	44,800 (28,800 – 67,100)
Annual AIDS-related deaths (Adult 15+)	23,900 (15,400 – 39,000)
Adult 15+ on ART; ART coverage (%)	1,035,615 (75%)
Children (0-14 years) living with HIV	105,200 (73,800 – 134,000)
Annual new HIV infections (Children 0-14)	8,000 (3,500 – 13,000)
Annual AIDS-related deaths (Children 0-14)	4,300 (2,100 – 7,500)
Children (0-14) on treatment; ART coverage (%)	86,323 (84%)
HIV prevalence (young adults 15-24); male	1.34% (0.71 – 1.91%)
HIV prevalence (young adults 15-24); female	2.61% (1.34 – 3.98%)
Annual new HIV infections (young adults 15-24); male	5,200 (1,100 – 8,600)
Annual new HIV infections (young adults 15-24); female	12,500 (7,200 – 18,800)
Annual AIDS deaths (young adults 15-24)	2,800 (1,700 – 4,700)
Adolescents living with HIV (10-19)	105,200 (62,800 – 147,700)
Annual new HIV infections (adolescents 10-19)	8,200 (2,400 – 15,900)
Annual AIDS deaths (adolescents 10-19)	2,100 (1,200 – 3,200)
Mothers needing PMTCT	69,500 (31,800 – 106,800)
Mothers on PMTCT; PMTCT coverage (%)	53,236 (77%)
EMTCT rate	11.5%

Table 1 shows the results for key indicators for 2017. The updated estimates for people living with HIV for all ages are similar to those produced previously.

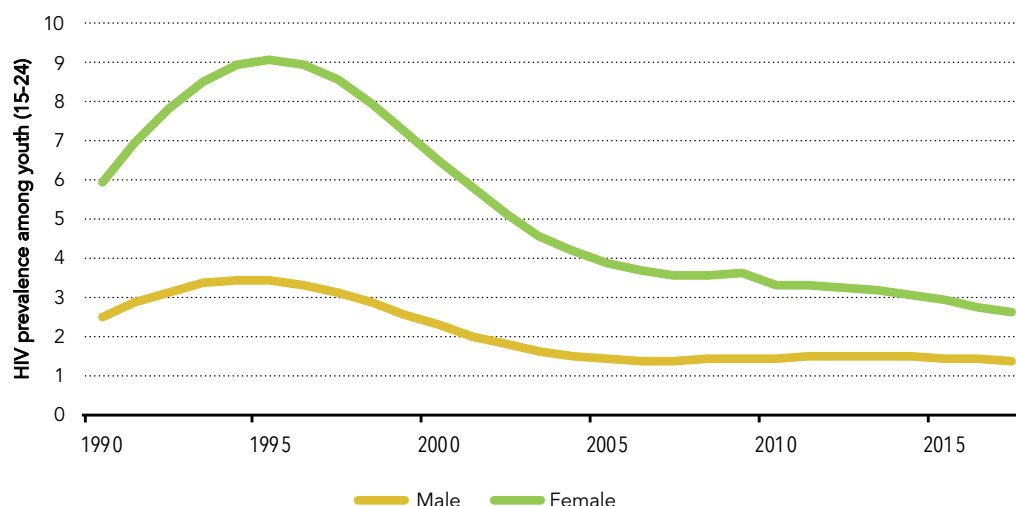
Adult HIV Prevalence

Adult HIV prevalence is the percentage of adults 15-49 living with HIV. The national prevalence trend indicates that prevalence peaked at 10-11% in the mid-1990s, declined to about 6% by 2006 and has been relatively stable at that level for several years, with a modest decline in recent years (Figure 1). In 2017, the National HIV prevalence rate was estimated at 4.9% with prevalence higher among women (5.2%) than men (4.5%).

Figure 1. HIV Prevalence Trend for Adults (15-49 years)

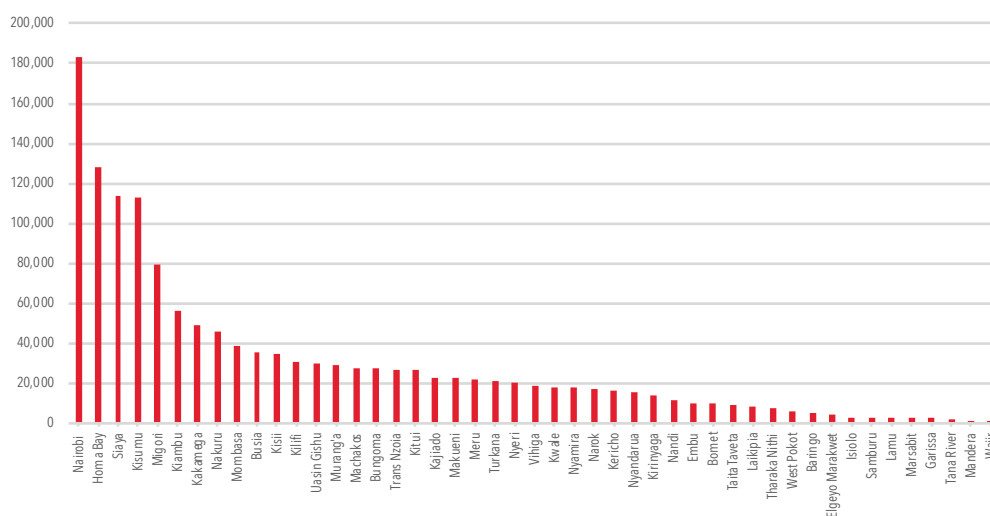
Youth HIV Prevalence

Comparable to adult HIV prevalence, the trend on national prevalence for youth shows that prevalence peaked at 9-10% and 3-4% in the mid-1990s, for female and male respectively. The prevalence declined to about 3.5% and 1.4% for female and male respectively by 2006 and has stabilized since then among men with a modest decline among female (Figure 2).

Figure 2. HIV Prevalence Trend for Youth (15-24 years)

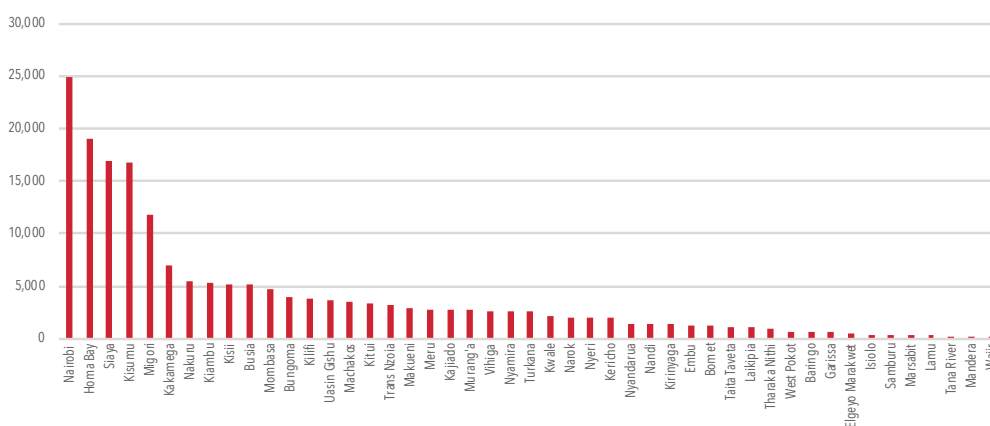
Adults aged 15+ living with HIV

There was an estimated 1,388,169 adults (15 years and above) living with HIV in 2017. The distribution is highly skewed, resulting in only eight counties contributed to more than 50% of the people living with HIV. They are namely, Nairobi (182,856), Homa Bay (128,199), Kisumu (112,862), Siaya (113,605), Migori (79,146), Kiambu (56,622), Kakamega (48,752) and Mombasa (38,548). Figure 3 shows the number of adults aged 15+ living with HIV by county.

Figure 3. Adults aged 15+ living with HIV across the counties

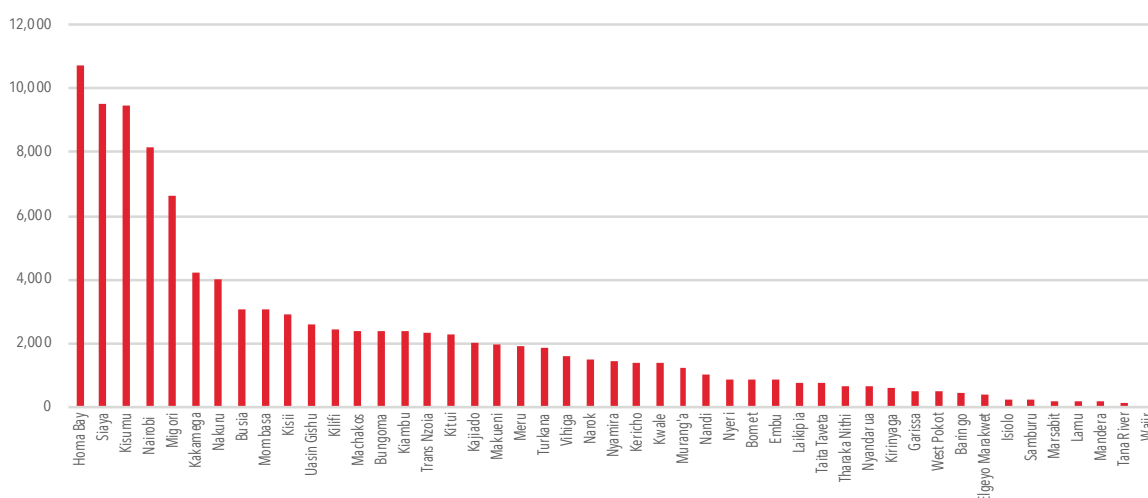
Youth aged 15-24 years living with HIV

Of the total number of people living with HIV in 2017, 184,719 (12%) were among youth 15-24 years of age. Youth with HIV were concentrated in the high prevalence counties in Kenya. Counties with high burden were Nairobi (24,918) Homa Bay (19,050), Siaya (16,881), Kisumu (16,771), Migori (11,761) Kakamega (6,986) and Nakuru (5,509) contribute to 55% of youth living with HIV in 2017. Figure 4 shows the number of youth aged 15-24 years living with HIV.

Figure 4. Youth aged 15-24 years living with HIV across the counties

Children 0-14 years living with HIV

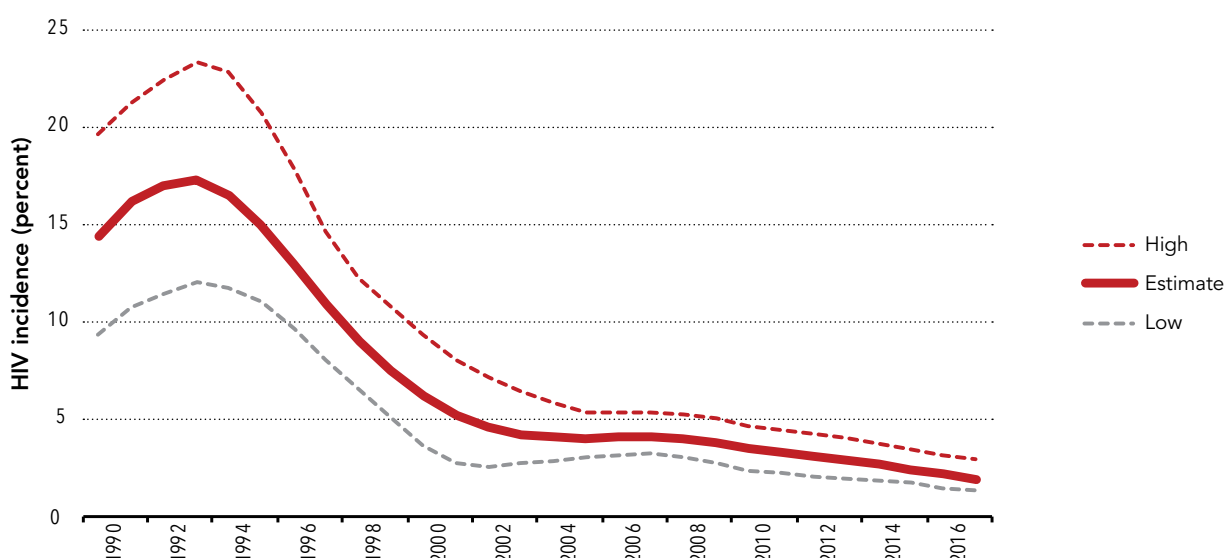
Of the total number of people living with HIV in 2017, 105,213 (6%) were among children 0-14 years of age. Half of the children (50%) living with HIV were from 7 out of the 47 counties, namely, Homa Bay (10,722), Siaya (9,501), Kisumu (9,439), Nairobi (8,137), Migori (6,161), Kakamega (4,224) and Nakuru (4,026). Figure 5 shows the number of children aged 0-14 years living with HIV.

Figure 5. Children aged 0-14 years living with HIV across the counties

Annual New Adult HIV Infections

Prevalence trends are used to estimate National adult incidence over time by incorporating the effects of AIDS mortality, non-AIDS mortality and population aging. Those calculations indicate that the annual number of new adult HIV infections increased steadily to a peak in the mid-1990s before declining sharply to about 63,000 per year in mid-2000. There has been a substantive decline in the past five years from approximately 59,000 in 2013 to 45,000 new adult infections per year in 2017 (Annex Table 1).

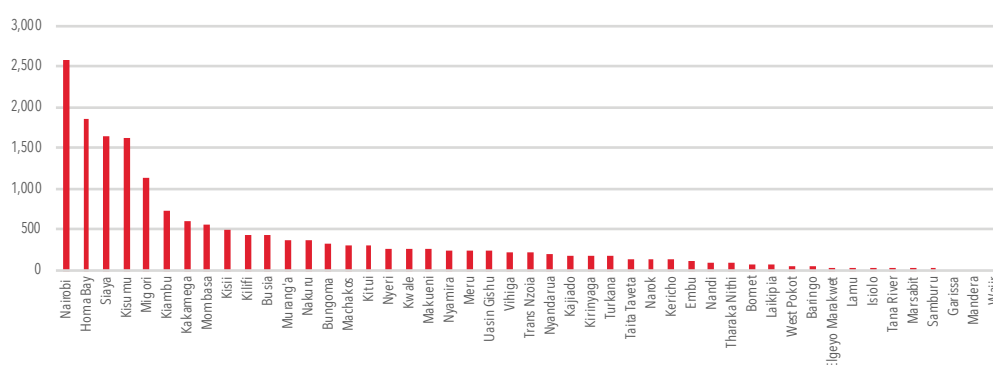
This trend implies that adult HIV incidence has declined from 2000 at 6.2 (3.6-9.3) per 1000 to 3.5 (2.3-4.6) per 1000 in 2010 and currently 1.9 (1.3 – 2.9) per 1000 in 2017 (Figure 6).

Figure 6. Trend of Adult 15+ HIV Incidence Rates

Annual New HIV Infections among Youth Aged 15-24 years

In 2017, new infections in Kenya were 52,767, with young people contributing 17,667 (33%). HIV infections among youth are concentrated in the high prevalence counties in Kenya. Counties with high number of HIV infections are Nairobi (2,587), Homa Bay (1,852), Siaya (1,641), Kisumu (1,630), Migori (1,143), Kiambu (730), Kakamega (596) and Mombasa (562), which contribute to 61% of new infections among youth aged 15-24 years in 2017. Figure 7 shows the annual new HIV infections among youth aged 15-24 years across the counties.

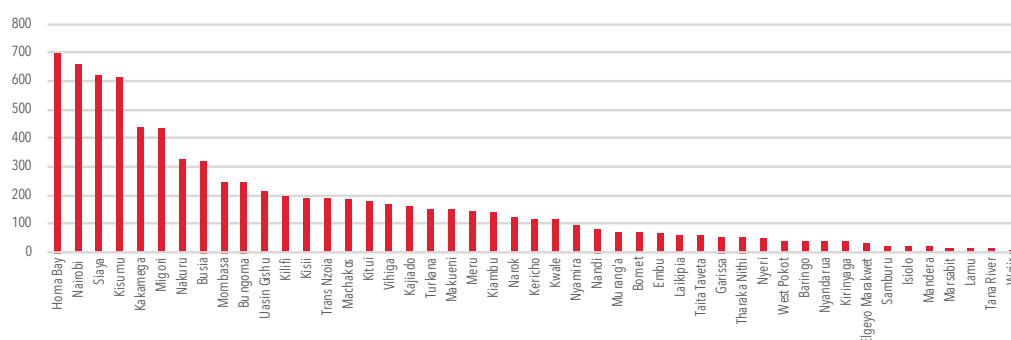
Figure 7. Annual New HIV Infections among Youth Aged 15-24 Years across the Counties



Annual New HIV Infections among Children Aged 0-14 years

There were 7,978 new HIV infections among children aged 0-14 years in Kenya which was about 15% of all total new HIV infections in 2017. These new HIV infections among the children were concentrated in the high prevalence counties in Kenya. Counties with high HIV infections were Homa Bay (700), Nairobi (660), Siaya (620), Kisumu (616), Kakamega (437), Migori (432), Nakuru (325), and Busia (318) and contribute to 51% of new infections among children aged 0-14 years in 2017. Figure 8 shows the annual new HIV infections among children aged 0-14 years across the counties.

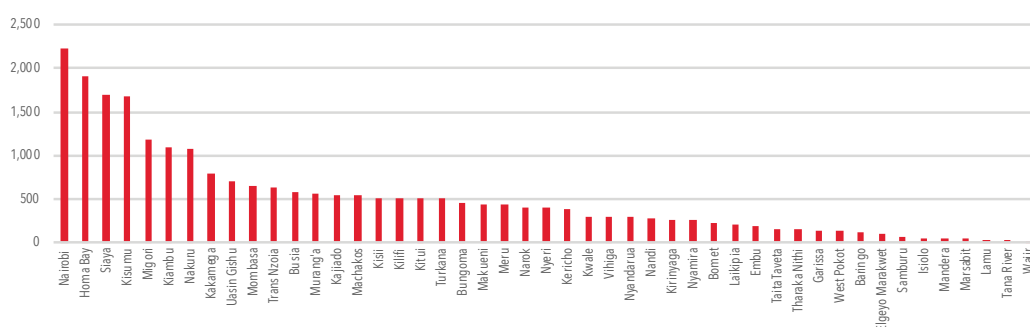
Figure 8. Annual New HIV Infections among Children Aged 0-14 Years across the Counties



Annual AIDS-related Deaths among Adults Aged 15+

Annual AIDS-related deaths in Kenya were 28,214 in 2017. Of the annual deaths, 23,902 (851%) were adults aged 15 years and over. About half of these deaths (52%) occurred in nine of the 47 counties, namely, Nairobi (2,232) Homa Bay (1,907), Siaya (1,690), Kisumu (1,679), Migori (1,177) Kiambu (1,096), Nakuru (1,081) Kakamega (794) and Uasin Gishu (703). Figure 9 shows the number of annual AIDS-related deaths among adults aged 15+ across the counties.

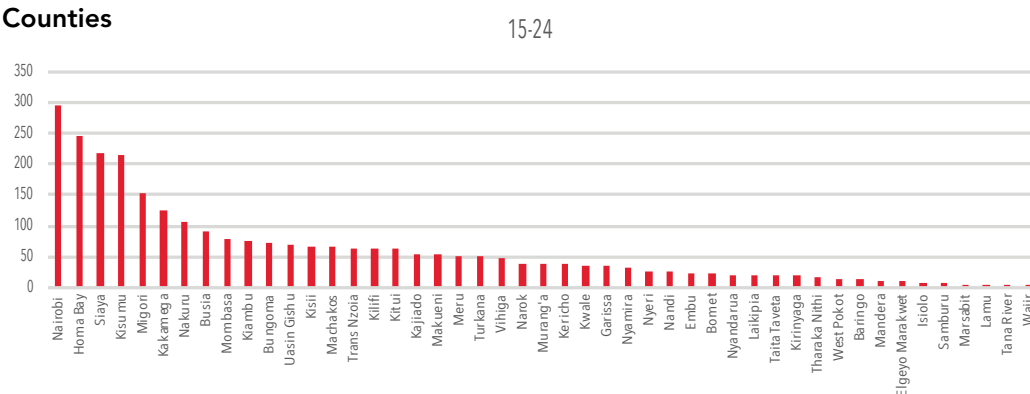
Figure 9. Annual AIDS-related Deaths among Adults aged 15+ across the Counties



Annual AIDS-related Deaths among Youth Aged 15-24 years

There were 2,830 AIDS-related deaths among youth aged 15-24 years in Kenya which was about 10% of all total AIDS-related deaths in 2017. About 54.% of these deaths occurred in nine of the 47 counties, namely, Nairobi (294) Homa Bay (246), Siaya (248), Kisumu (216), Migori (152), Kakamega (126); Nakuru (108), Busia (92) and Mombasa (79). Figure 10 shows the number of annual AIDS-related deaths among youth aged 15-24 years across the counties.

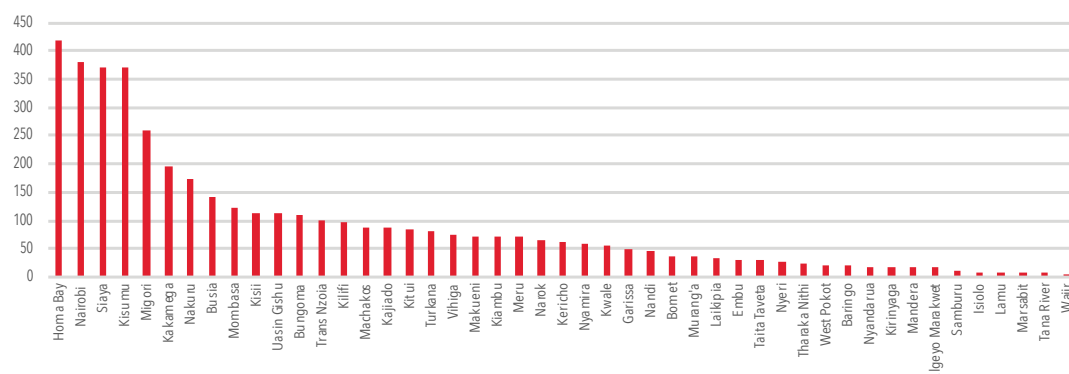
Figure 10. Annual AIDS-related Deaths among Youth Aged 15-24 years across the Counties



Annual AIDS-related Deaths among Children Aged 0-14 years

There were 4,312 AIDS-related deaths among children aged 0-14 years in Kenya which was about 15% of all total AIDS-related deaths in 2017. About 56% of these deaths occurred in nine of the 47 counties, namely, Homa Bay (420), Nairobi (380), Siaya (372), Kisumu (369), Migori (259), Kakamega (195), Nakuru (174), Busia (142) and Mombasa (124). Figure 11 shows the number of annual AIDS-related deaths among children aged 0-14 years across the counties.

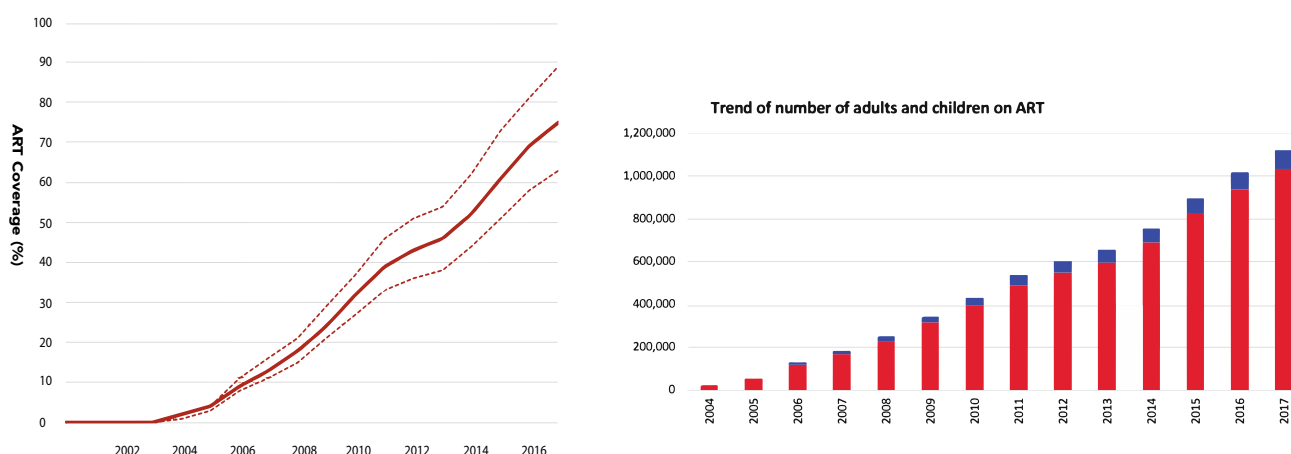
Figure 11. Annual AIDS-related Deaths among Youth Aged 0-14 years across the Counties



Need for and Coverage of Treatment

The number of adults in need of ART has increased by over 2-folds from approximately 627,900 in 2010 to 1,388,200 in 2017. Correspondingly, the ART need among children (0-14 years) has increased over time from 88,600 in 2010 to 105,200 in 2017. The ART guidelines have been changing over time to currently “treat all” irrespective of CD4 count or CD4 percent. ART need has increased both due to changes in treatment guidelines, as well as the increase in the number of people living with HIV over time. The number of persons receiving treatment has also increased dramatically over the last 14 years, reaching 1,121,938 by end of 2017, including 1,035,615 adults and 86,323 children. This has resulted in an estimated treatment coverage of 75% among adults (84% among children) in 2017 (Figure 12).

Figure 12. Cumulative HIV Related Deaths Averted by ART



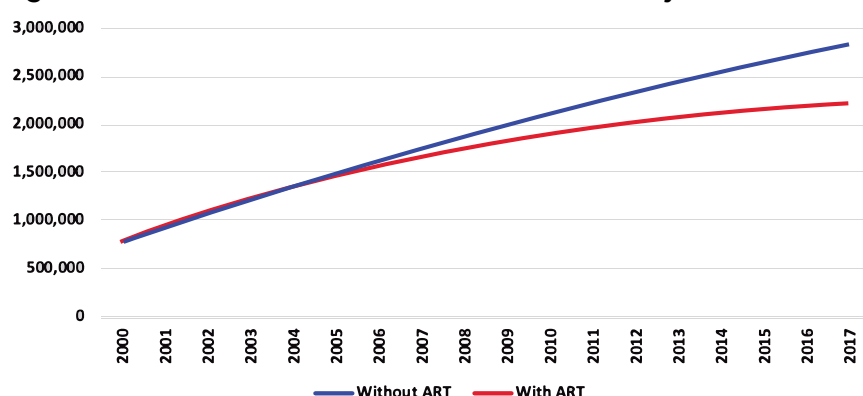
In future, need for treatment will only decrease if Kenya manages to scale up prevention and treatment to levels which results in fewer new HIV infections than the deaths among people living with HIV per year.

HIV-positive pregnant women in need of PMTCT services has decreased over time from 83,200 in 2005 to 69,500 in 2017; while the PMTCT coverage has increased over time from about 23% to 76% in the same time period. With the scale-up of PMTCT services, there has been a significant decline in EMTCT rate (final transmission rate including breastfeeding) from about 29.7% in 2005 to 11.5% in 2017.

Impact

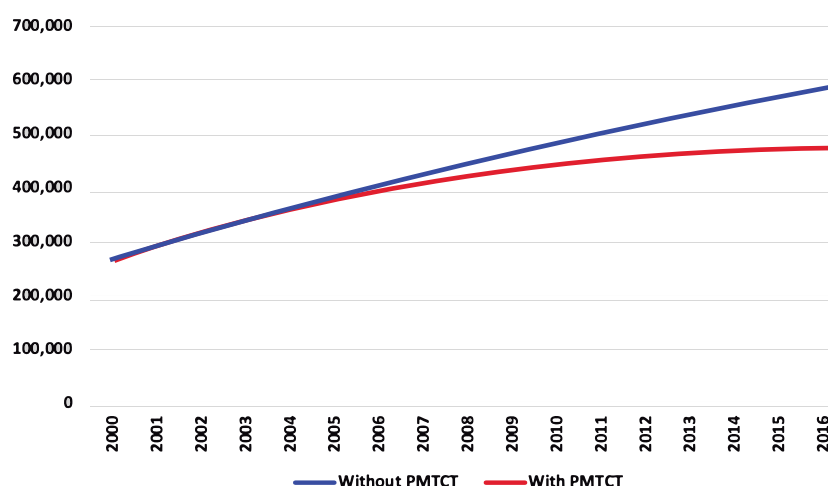
In total there have been approximately 635,500 AIDS deaths averted since the scale-up of ART began in 2004 through to 2017. As indicated in Figure 12, cumulatively an estimated 2.2 million AIDS deaths have occurred throughout the HIV epidemic till 2017.

Figure 13. Cumulative HIV Related Deaths Averted by ART



The program to prevent mother-to-child transmission of HIV has been scaling up rapidly in the past few years. In 2017, 53,236 women living with HIV received ARV prophylaxis to prevent transmission to their new born children. This represents about 77% of need. As a result of the scale up of this program since 2004, about 132,300 child HIV infections have been averted through to 2017 due to PMTCT scale up. As indicated in Figure 13, cumulatively an estimated 471,800 child infections have occurred throughout the HIV epidemic till 2017.

Figure 14. Cumulative number of Child Infections Averted by PMTCT



Annex Table 1, 2, and 3 below show the full set of indicators.

County HIV Estimates

County estimates are summarized in Table 2. Counties HIV epidemic is geographically diverse, with the incidence rates for 2017 ranging from 0.82% in Homa Bay County in former Nyanza region to almost zero incidence reported in Wajir County in former North Eastern region.

A call to sustained action towards 'Zero New Infections, Zero AIDS-related deaths and Zero discrimination'

The evidence presented above shows that Kenya continues to make progress towards the global targets of 'Zero New Infections, Zero AIDS-related deaths and Zero discrimination'. Sustaining prevention focus and intensity in the areas where significant declines in HIV incidence have been achieved is critical to consolidate these gains. Emerging epidemics must be addressed effectively, and prevention efforts intensified in high prevalence areas. With increasing treatment coverage and a decline in AIDS-related deaths, a significant number of people are likely to require first and second line ART treatment in the coming years. A major challenge for the HIV programme will be to ensure that the treatment requirements of people living with HIV are fully met without sacrificing the needs of prevention or the quality of treatment programmes.

Conclusion

The 2017 estimates show promising progress in ART treatment coverage, reductions in new infections among adults and children, and decreasing deaths due to HIV. The epidemic continues to be highly skewed, with a few counties contributing most of the annual new HIV infections, thus the strategy laid out in the 2014 prevention revolution roadmap, which advocated for tailoring prevention for the geographic distribution of disease is still valid.

Despite progress by Kenya in advancing towards National targets as reflected in the 2017 HIV estimates, much remains to be done to halt and reverse HIV. In absolute terms, a large proportion of Kenya's population is infected with or affected by HIV. The number of new infections per year continues to outpace the number of deaths among HIV-infected persons, resulting in a net annual increase in the size of the infected population. The spread of the epidemic must be halted, with zero new infections the principal target for epidemic control. The vision of eliminating the impact of the AIDS epidemic can be realized through scale up of evidence-based interventions such as treatment, PrEP, voluntary medical male circumcision. Improved strategic information, through improved surveillance of recent infections, treatment initiation, viral suppression, drug resistance, and deaths among people living with HIV can help programme planners better target interventions where they are most needed. Data presented through Kenya HIV Estimates 2018 should act as a primary step to catalyse continued action.

Table 2. County HIV Estimates for 2017

County	Population	ADULTS (15-49)			ADULTS (15+)			CHILDREN (0-14)			TOTAL			ADULTS			CHILDREN			PREGNANT WOMEN			Adolescents (10-19)			Young Adults (15-24)		
		Overall Prevalence	Male Prevalence	Female Prevalence	Incidence (per 1000)	HIV+	New Infections	HIV-related Deaths	HIV+	New Infections	HIV-related Deaths	HIV+	New Infections	HIV-related Deaths	Adults on ART	Coverage	Children on ART	Coverage	Need for PMCT	No on PMCT	Coverage	MTC Rate	HIV+	New Infections	HIV-related Deaths	HIV+	New Infections	HIV-related Deaths
Kenya		4.8%	4.5%	5.2%	1.8	1,388,169	44,789	23,902	105,213	7,978	4,312	1,493,382	52,767	28,214	1,035,618	75%	86,325	87%	69,497	53,067	76%	11.5%	105,230	8,177	2,072	184,719	17,667	2,830
Nairobi		6.1%	4.7%	7.5%	2.2	182,856	6,499	2,232	8,137	660	380	190,993	7,159	2,612	140,724	77%	7,611	94%	7,809	7,056	90%	8.5%	10,604	1,222	155	24,918	2,587	294
Mombasa		4.1%	2.5%	5.9%	1.9	38,548	1,490	654	3,051	248	124	41,599	1,738	777	41,748	*	2,630	86%	1,968	1,970	100%	3.4%	3,164	289	67	4,702	562	79
Kwale		3.8%	2.3%	5.4%	1.6	17,877	691	303	1,415	115	57	19,292	806	361	7,286	41%	785	55%	913	445	49%	11.5%	1,407	134	31	2,181	261	37
Kilifi		3.8%	2.3%	5.4%	1.6	30,597	1,183	519	2,422	197	98	33,019	1,380	617	21,224	69%	2,233	92%	1,562	1,081	69%	8.3%	2,511	229	53	3,732	446	63
Lamu		3.0%	1.8%	4.3%	1.3	2,445	95	41	194	16	8	2,638	110	49	954	39%	99	51%	125	96	77%	7.1%	201	18	4	298	36	5
Taita Taveta		4.1%	2.5%	5.8%	1.7	9,462	366	160	749	61	30	10,211	427	191	4,710	50%	352	47%	483	177	37%	13.4%	777	71	16	1,154	138	19
Tana River		1.3%	0.8%	1.8%	0.5	2,071	80	35	164	13	7	2,235	93	42	657	32%	74	45%	106	25	24%	15.4%	170	16	4	253	30	4
Garissa		0.8%	0.3%	1.4%	0.0	2,356	0	144	532	55	50	2,888	55	193	1,296	55%	71	13%	188	31	16%	28.2%	577	0	32	641	0	36
Mandera		0.2%	0.1%	0.3%	0.00	805	0	49	182	19	17	987	19	66	445	55%	39	21%	64	3	5%	31.4%	197	0	11	219	0	12
Wajir		0.1%	0.03%	0.2%	0.000	262	0	16	59	6	6	321	6	21	194	74%	9	15%	21	0	0%	32.6%	64	0	4	71	0	4
Embu		2.8%	1.6%	3.8%	1.1	9,866	363	193	855	66	31	10,721	429	225	7,846	80%	747	87%	432	302	70%	12.9%	847	35	18	1,241	112	23
Marsabit		1.4%	0.8%	1.8%	0.5	2,372	87	46	206	16	8	2,577	103	54	1,155	49%	160	78%	104	29	28%	23.3%	204	8	4	298	27	6
Meru		2.4%	1.4%	3.3%	0.9	22,090	813	432	1,914	147	70	24,005	960	503	17,283	78%	1,649	86%	966	558	58%	15.9%	1,896	79	40	2,778	251	52
Isiolo		3.2%	1.9%	4.3%	1.3	2,889	106	57	250	19	9	3,139	126	66	1,972	68%	248	99%	126	56	44%	19.2%	248	10	5	363	33	7
Makueni		4.2%	2.5%	5.7%	1.6	22,621	832	443	1,960	151	72	24,581	983	515	15,841	70%	1,719	88%	990	546	55%	16.5%	1,942	81	41	2,845	257	53
Kitui		4.5%	2.7%	6.1%	1.7	26,375	970	516	2,286	176	84	28,661	1,146	600	17,257	65%	2,003	88%	1,154	615	53%	17.0%	2,264	95	48	3,317	299	62
Machakos		3.8%	2.2%	5.1%	1.4	27,695	1,019	542	2,400	185	88	30,095	1,203	630	22,712	82%	2,148	90%	1,211	979	81%	10.2%	2,377	99	50	3,483	314	65
Tharaka Nithi		3.2%	1.9%	4.4%	1.2	7,779	286	152	674	52	25	8,453	338	177	6,022	77%	507	75%	340	132	39%	20.6%	668	28	14	978	88	18
Nyeri		3.7%	1.9%	5.5%	1.8	20,559	952	398	869	51	26	21,428	1,003	424	12,643	61%	732	84%	548	442	81%	13.5%	910	81	16	1,949	265	28
Nyandarua		3.5%	1.9%	5.2%	1.8	15,355	711	297	649	38	19	16,005	749	316	5,944	39%	539	83%	410	340	83%	12.7%	680	60	12	1,456	198	21
Kiambu		4.0%	2.1%	5.9%	2.2	56,622	2,623	1,096	2,394	139	71	59,016	2,763	1,166	34,417	61%	1,972	82%	1,510	1,836	*	6.2%	2,507	222	43	5,369	730	77
Muranga		4.2%	2.2%	6.2%	2.0	29,144	1,350	564	1,232	72	36	30,376	1,422	600	12,922	44%	935	76%	777	460	59%	20.4%	1,290	114	22	2,763	376	40
Kirinyaga		3.1%	1.7%	4.6%	1.6	13,893	644	269	588	34	17	14,481	678	286	9,074	65%	625	*	371	307	83%	12.7%	615	54	11	1,317	179	19
West Pokot		1.6%	1.3%	2.2%	0.3	5,524	104	131	488	39	21	6,012	144	152	3,164	57%	478	98%	289	130	45%	19.0%	451	22	11	668	45	13
Turkana		3.2%	2.7%	4.5%	0.7	21,343	403	506	1,887	152	81	23,230	556	588	4,945	23%	713	38%	1,117	531	48%	18.3%	1,743	87	42	2,582	175	51

County	Population	ADULTS (15-49)			ADULTS (15-49)			CHILDREN (0-14)			TOTAL			ADULTS			CHILDREN			PREGNANT WOMEN			ADOLESCENTS (10-19)			YOUNG ADULTS (15-24)		
		Overall Prevalence	Male Prevalence	Female Prevalence	Incidence (per 1000)	HIV+	New Infections	HIV-related Deaths	HIV+	New Infections	HIV-related Deaths	HIV+	New Infections	Adults on ART	Coverage	HIV-related Deaths	Children on ART	Coverage	Need for PMTCT	No on PMTCT	Coverage	MTC Rate	HIV+	New Infections	HIV-related Deaths	HIV+	New Infections	HIV-related Deaths
Kenya		4.8%	4.5%	5.3%	1.8	1,388,169	44,789	23,902	105,213	7,978	4,312	1,492,382	52,767	28,214	1,025,618	75%	86,325	82%	69,497	53,067	76%	11.5%	105,230	8,177	2,072	184,719	17,667	2,830
Trans Nzoia		4.3%	3.7%	6.1%	0.9	26,610	503	631	2,352	190	101	28,962	693	733	12,510	47%	1,144	49%	1,393	611	44%	19.2%	2,173	108	52	3,218	218	63
Narok		2.7%	2.3%	3.9%	0.6	16,810	317	399	1,486	120	64	18,296	438	463	7,512	45%	887	60%	880	472	54%	16.8%	1,373	68	33	2,033	138	40
Nandi		2.0%	1.7%	2.9%	0.4	11,712	221	278	1,035	84	45	12,748	305	323	7,681	66%	667	64%	613	476	78%	10.9%	956	48	23	1,417	96	28
Nakuru		3.4%	2.9%	4.8%	0.7	45,549	860	1,081	4,026	325	174	49,575	1,186	1,255	37,619	83%	2,963	74%	2,384	1,933	81%	10.1%	3,719	185	89	5,509	374	108
Elgeyo Marakwet		1.6%	1.4%	2.3%	0.3	4,400	83	104	389	31	17	4,789	115	121	2,540	58%	232	60%	230	176	76%	11.2%	359	18	9	532	36	10
Lakipia		2.7%	2.3%	3.8%	0.5	8,530	161	202	754	61	33	9,284	222	235	5,386	63%	457	61%	446	305	68%	13.2%	696	35	17	1,032	70	20
Kericho		2.9%	2.4%	4.1%	0.6	16,111	304	382	1,424	115	61	17,535	419	444	16,045	100%	1,462	*	843	532	63%	14.5%	1,316	65	32	1,949	132	38
Kajiado		3.9%	3.3%	5.5%	0.8	22,850	432	542	2,020	163	87	24,869	595	629	11,658	51%	845	42%	1,196	922	77%	11.1%	1,866	93	45	2,764	187	54
Bomet		1.9%	1.6%	2.7%	0.4	9,761	184	232	863	70	37	10,624	254	269	9,186	94%	850	99%	511	464	91%	7.7%	797	40	19	1,181	80	23
Baringo		1.3%	1.1%	1.9%	0.3	5,397	102	128	477	39	21	5,874	140	149	3,450	64%	364	76%	282	204	72%	12.3%	441	22	11	653	44	13
Samburu		1.8%	1.5%	2.5%	0.4	2,820	53	67	249	20	11	3,069	73	78	1,197	42%	232	93%	148	47	32%	22.2%	230	11	6	341	23	7
Uasin Gishu		3.9%	3.3%	5.5%	0.8	29,640	560	703	2,620	212	113	32,260	771	816	29,557	100%	2,067	79%	1,551	1,109	71%	12.4%	2,420	120	58	3,585	243	70
Bungoma		3.2%	2.4%	3.9%	1.3	27,648	999	450	2,396	248	111	30,044	1,246	561	22,375	81%	2,104	88%	1,868	1,424	76%	10.8%	2,297	106	53	3,962	338	71
Kakamega		4.5%	3.4%	5.6%	1.8	48,752	1,761	794	4,224	437	195	52,976	2,197	989	40,525	83%	3,977	94%	3,294	2,176	66%	13.2%	4,050	187	93	6,986	596	126
Busia		7.7%	5.7%	9.4%	3.1	35,527	1,283	578	3,078	318	142	38,606	1,601	721	33,654	95%	2,415	78%	2,401	1,597	67%	13.1%	2,951	136	68	5,091	434	92
Vihiga		5.4%	4.0%	6.7%	2.0	18,346	663	299	1,590	164	73	19,935	827	372	13,131	72%	1,370	86%	1,240	605	49%	17.3%	1,524	70	35	2,629	224	47
Siaya		21.0%	19.4%	22.4%	7.7	113,605	3,419	1,690	9,501	620	372	123,107	4,039	2,062	80,123	71%	7,462	79%	6,222	4,564	73%	12.2%	9,272	890	158	16,881	1,641	218
Kisii		4.4%	4.0%	4.7%	1.5	34,950	1,052	520	2,923	191	114	37,874	1,243	634	27,571	79%	2,337	80%	1,914	1,055	55%	16.7%	2,852	274	49	5,193	505	67
Migori		13.3%	12.2%	14.2%	5.0	79,146	2,382	1,177	6,619	432	259	85,765	2,814	1,436	65,820	83%	6,175	93%	4,335	4,034	93%	7.2%	6,459	620	110	11,761	1,143	152
Kisumu		16.3%	15.0%	17.4%	6.3	112,862	3,396	1,679	9,439	616	369	122,301	4,012	2,048	101,527	90%	8,225	87%	6,181	5,398	87%	8.7%	9,211	884	157	16,771	1,630	216
Homa Bay		20.7%	19.1%	22.1%	8.2	128,199	3,858	1,907	10,722	700	420	138,921	4,558	2,326	100,677	79%	9,655	90%	7,021	6,304	90%	8.1%	10,463	1,004	178	19,050	1,852	246
Nyamira		4.2%	3.9%	4.5%	1.4	17,537	528	261	1,467	96	57	19,004	623	318	13,439	77%	1,357	93%	960	512	53%	17.1%	1,431	137	24	2,606	253	34

Annexes

Annex Table 1. Indicators for Adults 15+ (2000-2017)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
HIV population																		
Total	1,439,266	1,410,688	1,372,523	1,329,214	1,286,317	1,251,989	1,230,904	1,227,410	1,234,607	1,250,164	1,217,029	1,242,570	1,272,108	1,299,907	1,324,993	1,347,943	1,371,420	1,388,168
Male	552,747	539,472	522,498	503,607	485,009	470,141	460,882	459,027	461,691	467,608	475,609	487,060	497,223	504,456	509,772	514,349	520,311	523,569
Female	886,519	871,216	850,026	825,607	801,308	781,848	770,022	768,383	772,916	782,556	741,420	755,510	774,885	795,451	815,221	833,594	851,109	864,599
New HIV infections																		
Total	81,287	71,812	65,790	62,630	62,602	63,479	66,974	69,073	70,293	69,310	63,742	62,823	60,445	58,520	56,425	52,615	48,108	44,789
Male	31,901	28,115	25,668	24,320	24,173	24,366	25,554	26,198	26,490	25,939	24,963	24,617	23,700	22,960	22,147	20,656	18,875	17,556
Female	49,386	43,697	40,122	38,310	38,428	39,113	41,420	42,875	43,803	43,371	38,779	38,206	36,744	35,560	34,278	31,959	29,234	27,233
Annual AIDS deaths																		
Total	88,225	94,494	99,329	102,680	103,751	97,457	88,590	73,670	64,129	54,813	43,660	38,420	32,256	32,116	32,949	31,635	26,719	23,903
Male	35,763	38,099	39,827	40,939	41,118	38,166	34,113	27,574	23,275	19,400	16,208	14,757	15,169	17,403	18,696	18,119	14,881	13,829
Female	52,461	56,395	59,502	61,741	62,633	59,291	54,477	46,096	40,854	35,412	27,452	23,663	17,086	14,713	14,253	13,517	11,838	10,074
Annual AIDS deaths among those on ART																		
Total	0	0	0	0	351	2,112	3,566	6,106	6,353	7,701	8,612	8,986	9,453	8,322	8,444	10,030	11,869	11,955
Male	0	0	0	0	187	1,117	1,880	3,191	3,288	3,916	4,137	4,172	3,466	3,194	3,430	4,340	5,406	5,089
Female	0	0	0	0	164	995	1,686	2,915	3,065	3,785	4,476	4,814	5,987	5,128	5,014	5,690	6,463	6,866
Annual AIDS deaths among those not on ART																		
Total	88,225	94,494	99,329	102,680	103,400	95,345	85,024	67,564	57,775	47,111	35,048	29,434	22,802	23,794	24,505	21,606	14,850	11,948
Male	35,763	38,099	39,827	40,939	40,932	37,048	32,233	24,383	19,986	15,484	12,071	10,584	11,703	14,210	15,266	13,779	9,476	8,740
Female	52,461	56,395	59,502	61,741	62,468	58,296	52,791	43,181	37,789	31,628	22,976	18,849	11,099	9,584	9,239	7,826	5,375	3,209

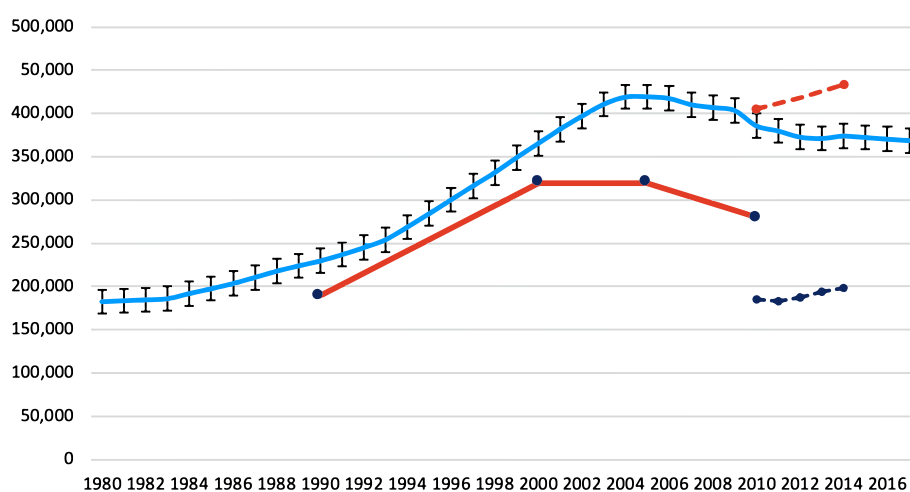
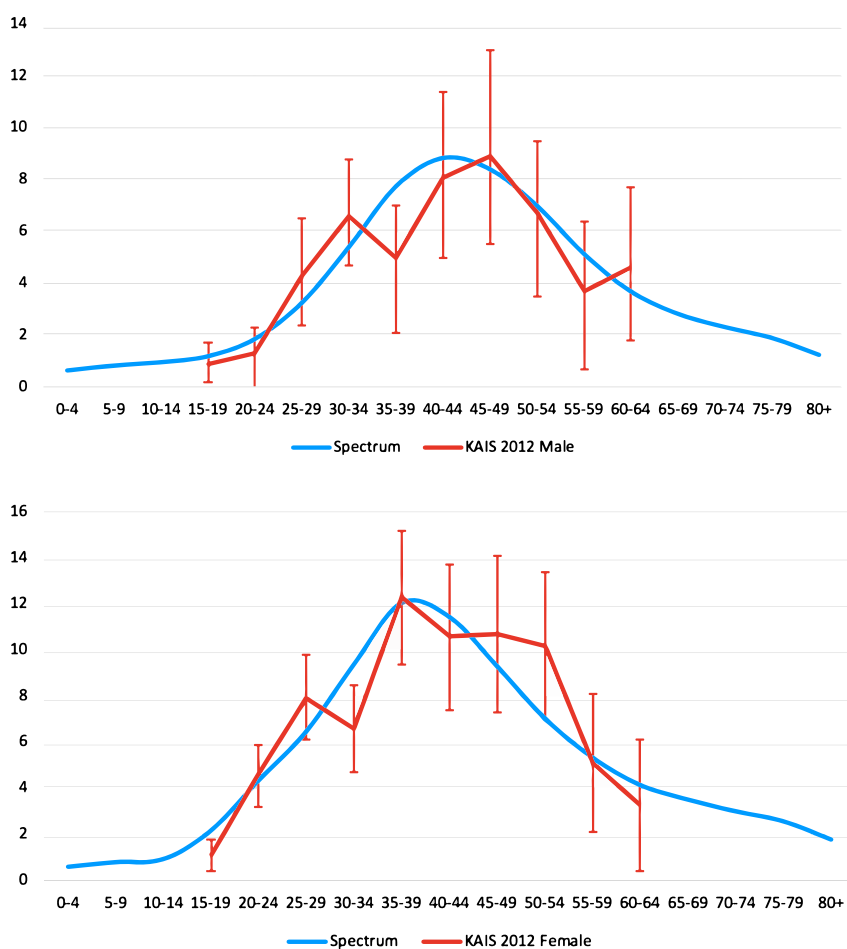
Annex Table 2. Indictors for children

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
HIV population																		
Total	159,521	166,466	171,608	174,918	176,209	174,766	171,109	165,894	158,455	153,972	147,548	138,926	133,149	129,193	123,698	116,179	109,878	105,213
Male	80,611	84,115	86,707	88,378	89,033	88,308	86,466	83,830	80,071	77,810	74,339	69,960	67,038	65,048	62,285	58,489	55,314	52,978
Female	78,911	82,351	84,901	86,540	87,176	86,458	84,644	82,064	78,384	76,161	73,209	68,967	66,111	64,145	61,412	57,689	54,563	52,235
New HIV infections																		
Total	34,199	32,805	31,238	29,644	27,774	24,717	22,306	20,658	16,764	16,518	13,478	10,965	12,743	12,845	10,179	6,982	7,105	7,978
Male	17,333	16,627	15,834	15,027	14,080	12,529	11,307	10,472	8,498	8,374	6,831	5,557	6,458	6,509	5,161	3,539	3,602	4,044
Female	16,866	16,178	15,404	14,617	13,695	12,188	10,999	10,186	8,266	8,144	6,647	5,407	6,285	6,336	5,018	3,443	3,504	3,935
Annual AIDS deaths																		
Total	23,120	23,047	22,745	22,282	21,587	20,237	19,004	17,891	15,318	11,575	10,227	9,317	8,302	6,824	6,042	5,216	4,586	4,312
Male	11,704	11,668	11,515	11,282	10,932	10,249	9,629	9,072	7,771	5,879	5,187	4,726	4,204	3,453	3,061	2,648	2,329	2,190
Female	11,416	11,379	11,229	11,000	10,655	9,988	9,376	8,818	7,547	5,696	5,040	4,592	4,097	3,371	2,981	2,568	2,257	2,121

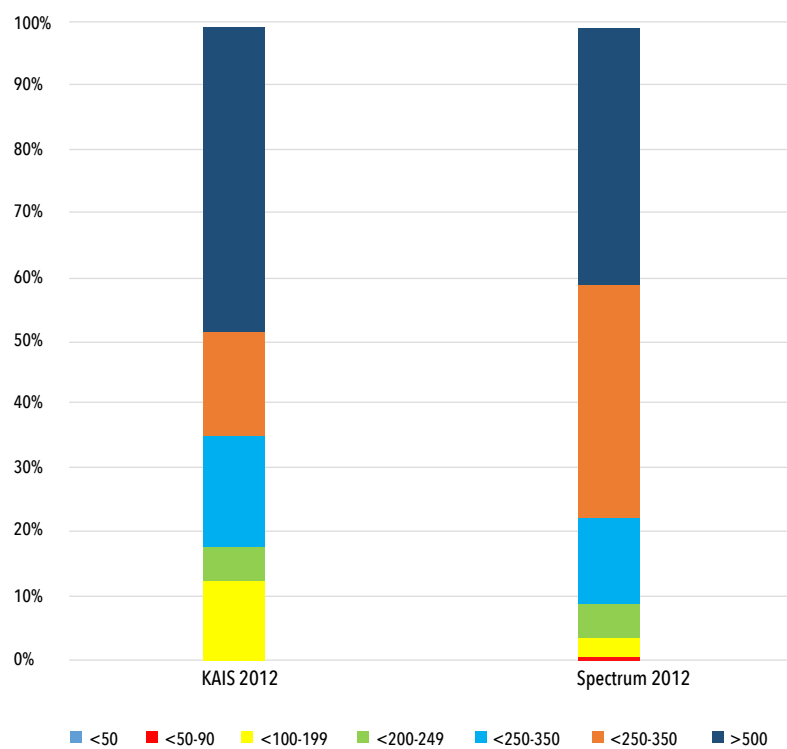
Annex Table 3. Treatment Indictors

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total receiving ART (15+)																		
Male																		
Number	0	0	0	0	10,981	23,800	52,971	74,023	101,203	138,541	172,209	166,748	186,509	196,756	217,548	262,207	290,771	322,104
Percent	0	0	0	0	9.2	19.6	42.1	54.8	68.6	85.4	68.1	61.7	65.4	66.1	49.7	58.7	55.9	61.5
Female																		
Number	0	0	0	0	13,979	30,293	67,418	94,211	128,856	177,018	224,317	323,689	362,050	399,472	471,608	563,890	649,395	713,511
Percent	0	0	0	0	7.4	15.8	34	44.6	56.5	71.4	59.8	80.8	83.7	86	65.1	75.1	76.3	82.5
ART coverage of all HIV+ adults (15+)																		
Total	0	0	0	0	1.94	4.32	9.78	13.71	18.63	25.24	32.58	39.47	43.12	45.87	52.01	61.29	68.55	74.6
Male	0	0	0	0	2.26	5.06	11.49	16.13	21.92	29.63	36.21	34.24	37.51	39	42.68	50.98	55.88	61.52
Female	0	0	0	0	1.74	3.87	8.76	12.26	16.67	22.62	30.26	42.84	46.72	50.22	57.85	67.65	76.3	82.53
Children receiving cotrimoxazole (0-14)																		
Number	0	0	0	0	0	0	0	0	36,001	45,603	54,337	55,804	71,630	79,677	86,806	82,501	79,287	78,947
Percent	0	0	0	0	0	0	0	0	53.2	56.9	59.1	69.2	99.9	100	100	100	100	100
Children receiving ART (0-14)																		
Number	0	0	0	0	0	1,897	8,333	16,668	20,577	28,370	36,096	48,548	55,438	60,141	66,070	71,547	78,739	86,323
ART coverage of all HIV+ children (0-14)	0	0	0	0	0	0	4.95	10.28	13.17	18.82	25.2	35.69	42.26	47.56	55.09	63.3	73.21	82.05
Total receiving ART(all ages)	0	0	0	0	24,960	54,093	128,722	184,902	250,636	343,929	432,622	538,985	603,997	656,369	755,226	897,644	1,018,905	1,121,938

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total need for ART (15+)																
Total	182,229	192,961	199,078	200,751	199,654	204,106	215,980	347,095	368,829	397,983	620,439	661,515	709,529	756,196	1,196,148	1,245,107
Male	85,399	89,605	91,655	91,692	90,499	91,745	96,320	153,510	162,429	174,665	269,803	286,087	300,691	313,017	484,640	498,010
Female	96,829	103,355	107,424	109,059	109,155	112,360	119,660	193,585	206,400	223,318	350,636	375,428	408,838	443,179	711,508	747,096
Total receiving ART (15+)																
Male																
Number	0	0	0	2,749	10,981	23,800	52,971	74,023	101,203	138,541	172,209	166,748	186,509	196,756	217,548	260,194
Percent	0	0	0	3	12.1	25.9	55	48.2	62.3	79.3	63.8	58.3	62	62.9	44.9	52.2
Female																
Number	0	0	0	3,499	13,979	30,293	67,418	94,211	128,856	177,018	224,317	323,689	362,050	399,472	471,608	560,020
Percent	0	0	0	3.2	12.8	27	56.3	48.7	62.4	79.3	64	86.2	88.6	90.1	66.3	75
ART coverage of eligible population (15+)																
Total	0	0	0	3.11	12.5	26.5	55.74	48.47	62.38	79.29	63.91	74.14	77.31	78.85	57.61	65.87
Male	0	0	0	3	12.13	25.94	54.99	48.22	62.31	79.32	63.83	58.29	62.03	62.86	44.89	52.25
Female	0	0	0	3.21	12.81	26.96	56.34	48.67	62.43	79.27	63.97	86.22	88.56	90.14	66.28	74.96
ART coverage of all HIV+ adults (15+)																
Total	0	0	0	0.49	2.05	4.61	10.43	14.56	19.64	26.32	32.15	38.49	41.64	43.87	49.24	57.78
Male	0	0	0	0.49	2.06	4.66	10.58	14.8	20	26.8	32.42	30.51	33.28	34.37	37.27	44.15
Female	0	0	0	0.49	2.04	4.58	10.32	14.37	19.36	25.96	31.94	44.48	47.83	50.77	57.8	67.45
HIV+ adults (15+)																
Total	1,514,760.56	1,436,726.46	1,356,694.26	1,280,934.54	1,217,176.28	1,172,849.53	1,153,804.84	1,155,754.79	1,171,636.69	1,198,827.85	1,233,441.04	1,274,237.54	1,317,350.36	1,359,226.25	1,399,611.08	1,440,361.70
Male	677,857.39	639,211.01	600,171.17	563,544.44	532,718.80	510,931.89	500,684.47	500,074.47	505,934.88	516,937.27	531,137.36	546,535.56	560,449.91	572,459.70	583,687.82	595,957.22
Female	836,903.17	797,515.45	756,523.08	717,390.10	684,457.47	661,917.64	653,120.37	655,680.32	665,701.81	681,890.58	702,303.69	727,701.98	756,980.45	786,766.55	815,923.26	844,404.49
Children needing cotrimoxazole (0-14)	246,381	230,584	213,647	196,718	181,123	168,046	157,476	148,985	143,097	146,214	148,848	144,128	140,820	145,833	151,048	150,441
Children receiving cotrimoxazole (0-14)																
Number	0	0	0	0	0	0	0	18,919	36,001	45,603	54,337	55,804	71,630	79,677	86,806	82,501
Percent	0	0	0	0	0	0	0	12.4	24.8	32.3	35.9	38.2	50.4	57.1	57.1	55
Total coverage for cotrimoxazole (0-14)	0	0	0	0	0	0	0	12.08	3.91	3.66	3.27	3.08	3.63	3.67	3.69	3.52
Children needing ART (0-14)	102,651	97,808	92,174	86,017	79,016	71,428	65,789	62,571	61,202	67,611	72,297	72,313	76,183	84,821	88,793	93,056
Children receiving ART (0-14)																
Number	0	0	0	0	0	1,977	8,333	16,668	20,577	28,370	36,096	48,548	55,438	60,141	66,070	73,767
Percent	0	0	0	0	0	2.6	12.3	26.1	33.6	46.3	48.8	68.8	74.9	76.8	72.3	85.5
ART coverage of eligible population (0-14)	0	0	0	0	0	2.77	12.67	26.64	33.62	41.96	49.93	67.14	72.77	70.9	74.41	79.27
ART coverage of all HIV+ children (0-14)	0	0	0	0	0	1.11	4.87	10.24	13.39	19.68	27.17	39.52	47.76	55.03	64.9	75.14

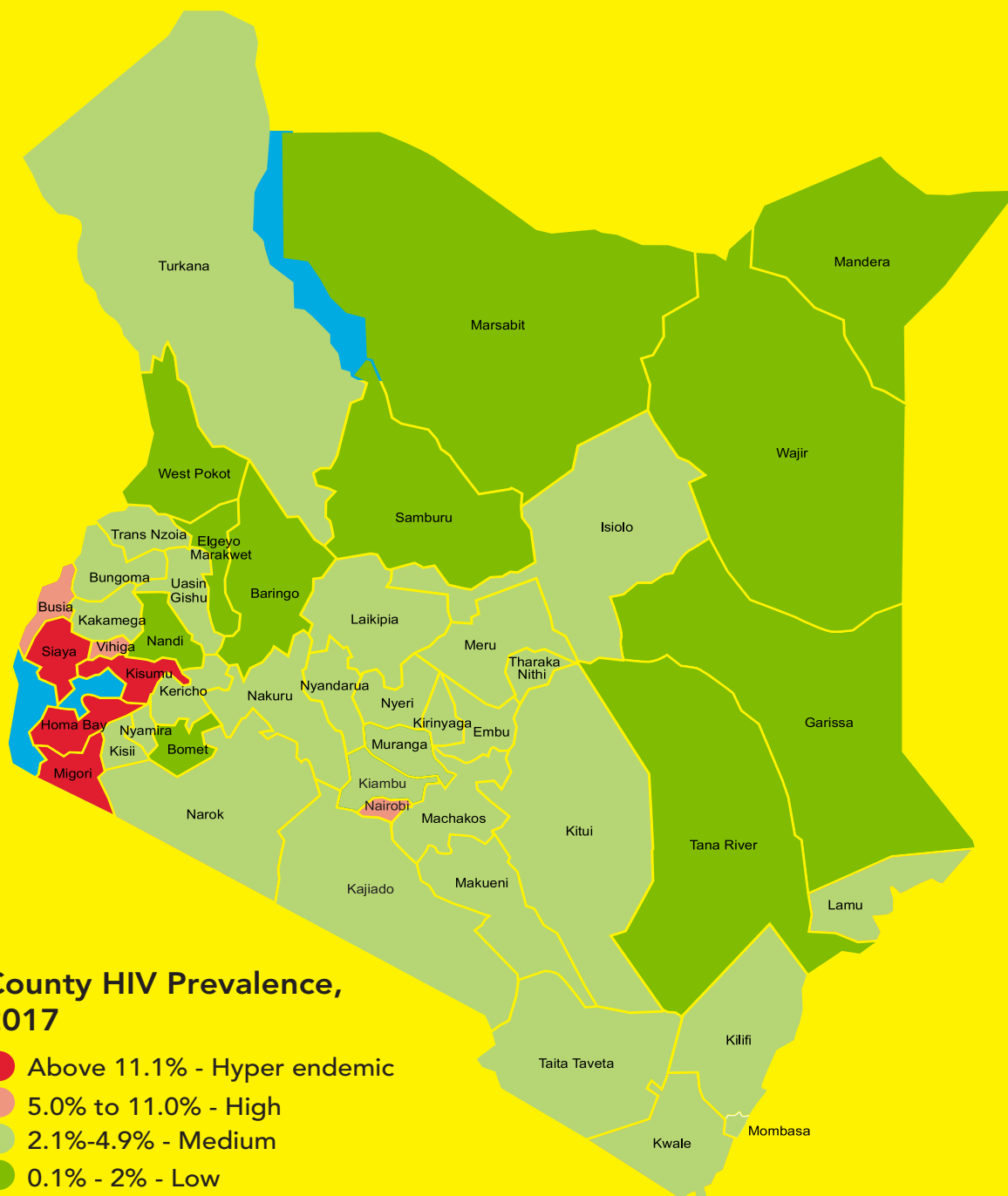
Annex Figure 1. Spectrum Estimate of All-Cause Mortality Compared to Vital Statistics**Annex Figure 2. Spectrum estimates of prevalence by age compared to survey estimates.**

Annex Figure 3. Distribution of HIV+ Adults not on ART in 2012



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