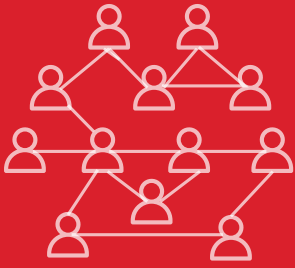


REPUBLIC OF KENYA



MINISTRY OF HEALTH



HIV EPIDEMIC APPRAISAL IN KENYA

A toolkit



**NATIONAL SYNDEMIC DISEASES
CONTROL COUNCIL**



PHDA
Partners for Health and
Development in Africa



**University
of Manitoba**

2024

Suggested citation: National Syndemic Diseases Control Council (NSDCC), Partners for Health and Development in Africa (PHDA) and University of Manitoba (UoM). 2024. HIV epidemic appraisal in Kenya: A toolkit. Nairobi: Ministry of Health



HIV EPIDEMIC
APPRAISAL IN KENYA

A toolkit

Contents

Acknowledgements.....	iii
Abbreviations.....	iv
1 Introduction.....	1
2 HIV prevalence and incidence.....	4
2.1 Data compilation/preparation.....	5
2.2 Data analysis.....	7
2.3 How this analysis can be used for prioritising counties.....	8
2.4 How this analysis can be used for prioritising sub-counties.....	9
3 Epidemic typology.....	15
3.1 Data compilation/preparation.....	17
3.2 Data analysis.....	19
3.3 How this analysis can be used for prioritising populations and geographies.....	25
4 Programme coverage gaps.....	27
4.1 Prevention of Mother-to-Child Transmission Programme.....	29
4.2 Key Populations Programme.....	37
4.3 Adolescents and Young People Programme.....	43
4.4 Voluntary Medical Male Circumcision Programme.....	50
4.5 Antiretroviral Therapy Programme.....	54
4.6 How this analysis can be used for prioritising populations and geographies.....	61
ANNEX 1: Regional level HIV epidemic appraisal: Meru County, 2023.....	62
ANNEX 2: HIV prevalence in key populations.....	74



Acknowledgements

This toolkit has been written by Dr. BM Ramesh and edited by Brooks Anderson.

Thanks to Dr. Ruth Laibon Masha, Joshua Gitonga, Dr. Celestine Mugambi, Japheth Kioko, Irene Gomba, Morris Ogero, Mercy Khasiani, Wendy Chege, John Kuria, Brandwell Mwangi, Henry Damisoni, Edwin Opwora, Catherine Mbaire, Dr. Samwel Mwalili, Hermes Gichane, Janet Musumbi, Jafred Mwangi, Rodgers Kong'ani, Elizabeth Gogo, Dr. Fatibiyya Wangara, Martin Kamau, Celelia Wandera, Jack Ogony, Janet Lunayo, Elvis Kirui, Dr. Peter Arimi, Dr. Souradet Shaw, Parinita Bhattacharjee and Dr. James Blanchard.

This toolkit has been designed by 129 Degrees Design Studio.

Abbreviations

ABYM	Adolescent Boys and Young Men
AGYW	Adolescent Girls and Young Women
AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal Care
ART	Antiretroviral Therapy
CAIPs	County AIDS Integrated Plans
EPP	Estimation and Projection Package
FSW	Female Sex Worker
GP	General Population
HMIS	Health Management Information System
HIV	Human Immunodeficiency Virus
IBBS	Integrated Biological and Behavioural Survey
KAIS	Kenya AIDS Indicator Survey
KenPHIA	Kenya Population-based HIV Impact Assessment
KHIS	Kenya Health Information System
KP	Key Population
KPSE	Key Population Size Estimation
L&D	Labour and Delivery
MoH	Ministry of Health
MSM	Men Who Have Sex with Men
NACC	National AIDS Control Council
Naomi	Network-based Approaches for Modeling HIV Incidence
NASCOP	National AIDS and STI Control Program
NSDCC	National Syndemic Diseases Control Council
PBS	Polling Booth Survey
PLHIV	Person(s) Living with Human Immunodeficiency Virus
PMTCT	Prevention of Mother-to-Child Transmission
PNC	Postnatal Checkup
PWID	People (or Person) Who Inject Drugs
UNAIDS	Joint United Nations Programme on HIV/AIDS
VMMC	Voluntary Medical Male Circumcision

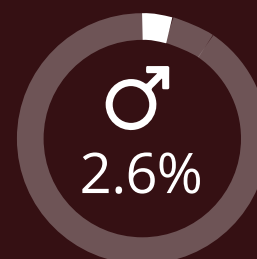
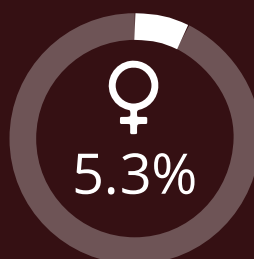


01

Introduction

The annual HIV incidence in Kenya was 12 per 1000 among adult women and 5 per 1000 among adult men (15–64 years) in 2021.¹

The **national HIV prevalence among adults was 3.7% in 2018**, twice as high among women, at 5.3%, compared to men, at 2.6%.^{1,2}




Kenya has a devolved governance system comprising the national government and 47 county governments that are autonomous and responsible for managing health facilities and pharmacies, and for promoting and providing health care services for HIV infection, tuberculosis, malaria, and reproductive, maternal, neonatal, child, and adolescent health.

In 2014, the Government of Kenya committed to prioritise and scale up HIV prevention interventions with the development of the Kenya HIV Prevention Revolution Roadmap 2030. It also set an ambitious target of reducing HIV incidence by 75% with the development and launch of the Kenya AIDS Strategic Framework 2014/15–2018/19. However, the country was not able to achieve its HIV prevention targets by 2019, so it has reprioritised reducing new HIV infections as one of the objectives of the Kenya AIDS Strategic Framework II, 2019/20–2024/25. The country also developed a Multisectoral HIV Prevention Acceleration Plan 2023–2030 to fast track achievement of the HIV prevention targets.³

Although the national government provides policy and strategic direction, as health is a devolved programme, the counties' role in designing and implementing HIV prevention programmes is critical. To this end, Kenya's Division of National AIDS and STI Control Program (NAS COP) and the National Syndemic Diseases Control Council (NSDCC) in partnership with University of Manitoba conducted a subnational epidemic appraisal during 2020–21 to inform the national HIV prevention strategy.

The appraisal was framed around three questions:


- 
1. Which geographies should Kenya prioritise for HIV prevention to achieve the country's goal of reducing HIV incidence by 75%?
 2. Which populations should Kenya prioritise in these geographies?
 3. What programmes and services should be strengthened and/or scaled up in these geographies and populations?

¹National Syndemic Diseases Control Council. Kenya HIV estimates report, 2022. Nairobi, NSDCC

²National AIDS Control Council. 2020. Kenya AIDS Strategic Framework II, 2020/21–2024/25. Nairobi: NACC. <https://nacc.or.ke/kenya-aids-strategic-framework-kasf/>

³National Syndemic Diseases Control Council. 2023. National Multisectoral HIV Prevention Acceleration Plan 2023–2030. Nairobi: NSDCC. <https://nsdcc.go.ke/download/national-multisectoral-hiv-prevention-acceleration-plan-2023-2030/>

The epidemic appraisal included the following three components:

- 
1. Analysis of HIV prevalence and incidence to identify high burden counties for geographic prioritisation.
 2. Analysis of population size and HIV prevalence to define epidemic typology and prioritise populations for preventive interventions.
 3. Analysis of routine programme monitoring data to assess programme coverage.

The data used in this appraisal was for the year 2021.

In this toolkit, we describe the detailed steps—data compilation/preparation, data analysis, presentation of the results, and interpretation—used in each component of the subnational epidemic appraisal in Kenya, with an objective of supporting future regular epidemic appraisals in the country. This epidemic appraisal is based entirely on secondary data, so the compilation of the required latest data from different sources is an important first step.

The appraisal uses Microsoft Excel for all analysis, so the data are compiled in two Excel Workbooks:

Toolkit_County Excel Workbook

[\(https://nsdcc.go.ke/epidemic-appraisal-toolkit/toolkit_county-excel-workbook-2/\)](https://nsdcc.go.ke/epidemic-appraisal-toolkit/toolkit_county-excel-workbook-2/)

Toolkit_Subcounty Excel Workbook

[\(https://nsdcc.go.ke/epidemic-appraisal-toolkit/toolkit_-subcounty-excel-workbook/\)](https://nsdcc.go.ke/epidemic-appraisal-toolkit/toolkit_-subcounty-excel-workbook/)

The detailed steps described in this toolkit for the subnational epidemic appraisal can also be followed for the sub-county level epidemic appraisal in each county. This toolkit presents and discusses epidemic appraisal results for four counties: Kisumu, Mombasa, Nairobi, and Nakuru. A sub-county epidemic appraisal report for Meru is provided in Annex 1.



02

HIV prevalence and incidence

HIV incidence and prevalence outputs from three models are used as the primary measures for determining county-level disease burden and prioritising geographies in Kenya: the Spectrum/Estimation and Projection Package (EPP)⁴ for the national and regional estimates, Naomi (Network-based Approaches for Modelling HIV Incidence)⁵ for county-level estimates, and Shiny90⁶ for the estimates of HIV status awareness. The Spectrum/EPP model, recommended by the UNAIDS Reference Group on Estimates, Modelling and Projections, uses data collected from antenatal clinic surveillance; population-based surveys, including the Kenya AIDS Indicator Survey II (KAIS II); and HIV programme data to estimate the prevalence of HIV and AIDS. EPP is used to fit smooth prevalence curves to surveillance and survey data separately for the former eight regions or 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 programme coverage (antiretroviral therapy [ART], prevention of vertical transmission, cotrimoxazole for children) to estimate indicators, such as the number of people living with HIV; the number of new acquisitions; AIDS deaths; and the need for ART, prevention of vertical transmission, and cotrimoxazole. These regional estimates, along with the number of people living with HIV (PLHIV), are then exported to the Naomi model to obtain the county-level estimates of incidence and prevalence, in addition to other estimates.

The Spectrum/EPP/Naomi model is the only source of county-wise annual estimates of HIV incidence and prevalence. Like any other modelling approach, the model outputs are affected by data quality and assumptions. The Naomi model, in particular, tends to underestimate the incidence and prevalence among children in Kenya.

Additional measures include the model-based county-wise estimates of new infections among adults and children.

2.1 Data compilation/preparation

The county-wise data in Table 1, also shown in Sheet “prevalence incidence” of the “Toolkit_County” Excel Workbook, are compiled from specified sources:

1. The most recent data on HIV incidence. In this example, we have used HIV incidence for 2021 from the model-based estimates from NSDCC (Column B).
2. Estimated new infections (adults and children) from the most recent model-based estimates. Here we have used this data from NSDCC (Column C).
3. HIV prevalence in the general population age 15–49 for the most recent year, based on the model estimates. Here we have used the 2021 model-based estimates from NSDCC (Column D).

Note that the counties are arranged in alphabetical order, and make sure that while copying the numbers for each county, the source data is sorted according to the county name in ascending order. Also note that the HIV incidence is per 1,000 and HIV prevalence is a percentage, as shown in Table 1.

⁴Stover, J, Brown T, Puckett R and Peerapatanapokin W. 2017. Updates to the Spectrum/Estimations and Projections Package model for estimating trends and current values for key HIV indicators. AIDS. 31: S5-S11. doi: 10.1097/QAD.0000000000001322

⁵Eaton JW, Dwyer-Lindgren L, Gutreuter S et al. 2021. Naomi: a new modelling tool for estimating HIV epidemic indicators at the district level in sub-Saharan Africa. J Int AIDS Soc., 24: e25788. <https://doi.org/10.1002/jia2.25788>

⁶Maheu-Giroux M, Marsh K, Doyle CM et al. 2019. National HIV testing and diagnosis coverage in sub-Saharan Africa: a new modeling tool for estimating the ‘first 90’ from programme and survey data. AIDS. Dec 15;33 (Suppl 3):S255-S269. doi: 10.1097/QAD.0000000000002386

Table 1

HIV incidence, estimated new infections, and prevalence by county, Kenya, 2021

A	B	C	D
County	HIV incidence per 1,000 (2021)	Estimated new infections (adults and children) (2021)	HIV prevalence (%) in general population age 15–49 (2021)
Baringo	0.6	262	1.65
Bomet	0.7	457	2.40
Bungoma	0.6	796	2.45
Busia	1.2	828	5.44
Elgeyo-Marakwet	0.7	218	2.02
Embu	0.5	230	2.17
Garissa	0.0	38	0.17
Homa Bay	4.1	2695	16.18
Isiolo	0.5	98	1.85
Kajiado	1.1	966	3.53
Kakamega	0.8	1198	3.58
Kericho	1.0	666	3.24
Kiambu	0.3	729	2.27
Kilifi	0.7	713	2.78
Kirinyaga	0.3	157	2.51
Kisii	1.3	1065	4.66
Kisumu	4.4	3117	15.47
Kitui	0.7	614	3.29
Kwale	0.8	453	3.11
Laikipia	0.6	243	2.23
Lamu	0.6	58	2.26
Machakos	0.7	821	3.02
Makueni	0.6	464	2.80
Mandera	0.1	88	0.41
Marsabit	0.3	89	0.86
Meru	0.6	782	2.54
Migori	2.8	1943	10.38
Mombasa	1.4	1241	5.37
Murang'a	0.3	239	2.41
Nairobi	1.2	3828	4.32
Nakuru	0.9	1496	3.46
Nandi	0.8	555	2.79
Narok	0.9	725	2.88
Nyamira	0.9	391	3.75
Nyandarua	0.3	137	2.00
Nyeri	0.3	193	2.97
Samburu	1.5	307	4.59
Siaya	3.6	2180	14.06
Taita-Taveta	0.8	209	3.46

A	B	C	D
County	HIV incidence per 1,000 (2021)	Estimated new infections (adults and children) (2021)	HIV prevalence (%) in general population age 15–49 (2021)
Tana River	0.3	65	1.05
Tharaka-Nithi	0.6	175	2.52
Trans-Nzoia	1.0	709	3.39
Turkana	1.0	665	3.10
Uasin Gishu	1.2	1048	3.95
Vihiga	1.0	434	4.58
Wajir	0.0	27	0.16
West Pokot	0.3	126	0.83

2.2 Data analysis

The county-wise HIV incidence and prevalence data may be presented in a figure as described here:

Figure 1 primarily uses data on the number of new infections in 2021 (Column C) and the HIV incidence for 2021 (Column B). Additionally, the cumulative percentage of new infections is computed, after sorting the data on Column C in descending order.

At this stage it is recommended that Sheet “prevalence incidence” is copied and pasted as “values” into Sheet2. Rename the sheet as “Figure1” and follow these steps:

1. Sort the data by Column C (Estimated new infections [adults and children] 2021), from largest to smallest.
2. In Column I, row 2, insert the formula: =C2
3. In Column I, row 3, insert the formula: =I2+C3
4. Copy the formula in Column I and row 3 all the way down to the last county.
5. Name Column I as “Cumulative number of new infections”
6. In Column J, row 2, put in the formula: =I2/\$I\$48%
7. Copy the formula in Column J row 2 all the way down to the last county.

Now, the number of new infections and the cumulative percentage of new infections are plotted in clustered columns, with the cumulative percentage in a line graph on the secondary axis, as shown in Figure 1 (copied from Toolkit_County Excel Workbook Sheet Figure1).

Figure 1. County-wise estimated new HIV infections, Kenya, 2021

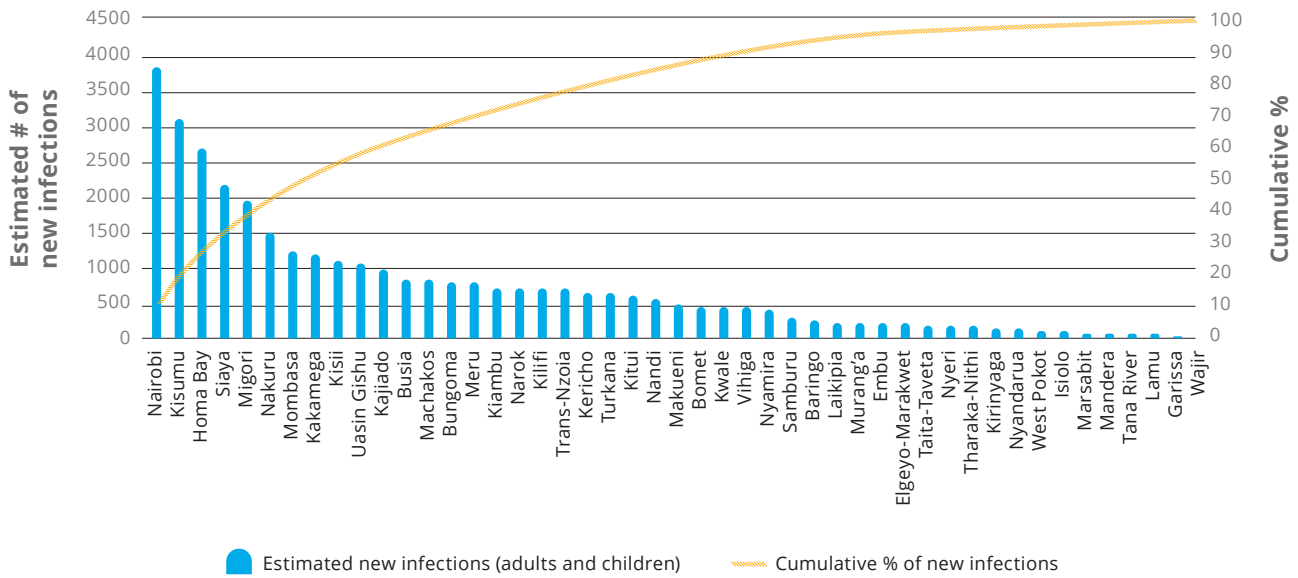


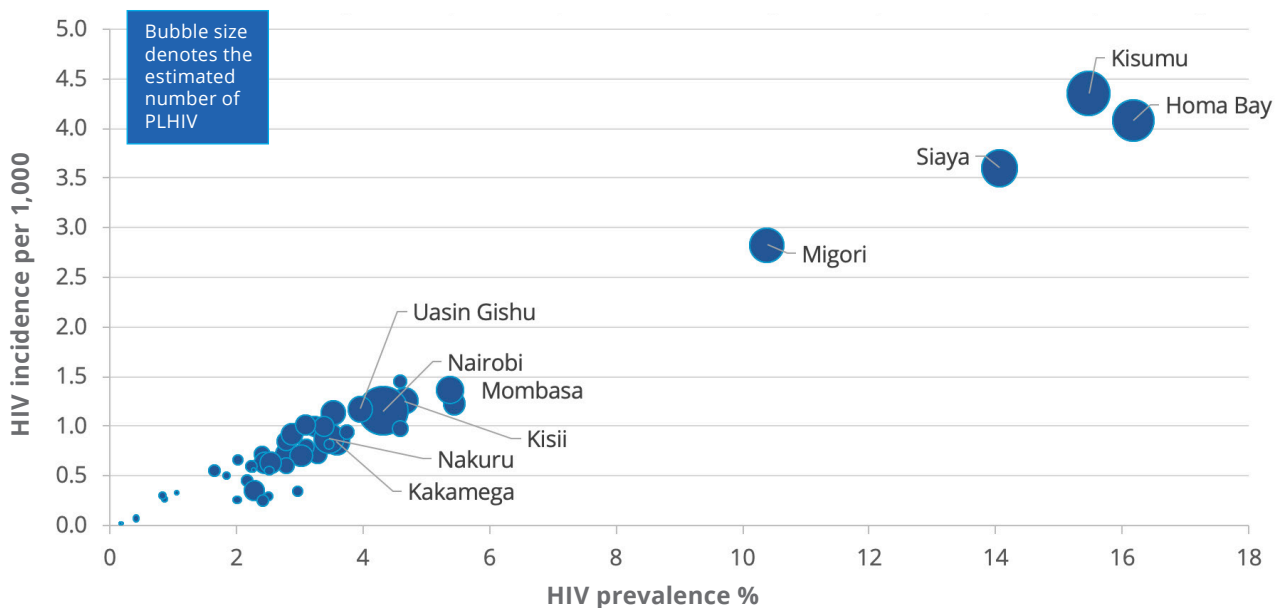
Figure 1 may be interpreted as follows:

1. 23 counties with more than 500 new infections accounted for 85% of new infections in Kenya.
2. 10 high-burden counties with more than 1000 new infections—Nairobi, Kisumu, Homa Bay, Siaya, Migori, Nakuru, Mombasa, Kakamega, Kisii, and Uasin Gishu—together contributed 57% of all new infections.

2.3 How this analysis can be used for prioritising counties

The counties can be prioritised based on disease burden, considering both the prevalence and incidence of HIV. As shown in Figure 2 (where bubble size denotes the number of new infections), four counties—Kisumu, Homa Bay, Siaya, and Migori—have relatively higher prevalence as well as incidence. Therefore, special effort should be made to slow HIV transmission in these counties. And, because of the high numbers of new infections in the large counties of Nairobi and Mombasa, they too are critical for HIV prevention, despite the relatively low prevalence and incidence in these counties.

Figure 2. Kenya's counties by HIV prevalence and incidence



Note: Only counties with 1000+ new HIV acquisitions are labelled by name in Figure 2.

2.4

How this analysis can be used for prioritising sub-counties

Within the counties, sub-counties can also be prioritised using similar analysis of HIV prevalence and incidence. The HIV incidence and prevalence data for each sub-county are compiled in Sheets “Figure 1” and “Figure 2” of the “Toolkit_Subcounty” Excel Workbook and the results of HIV prevalence-incidence analyses for Kisumu, Mombasa, Nairobi, and Nakuru are presented and discussed below.

2.4.1 Kisumu

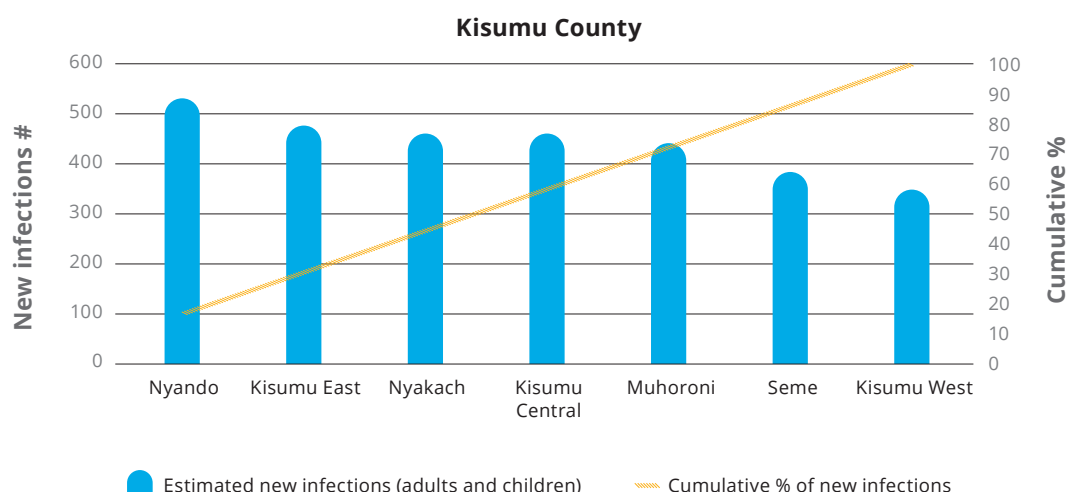
Table 2

HIV incidence, estimated new infections, and prevalence in the general population by sub-county, Kisumu County, 2021

County: KISUMU					
Sub-county	HIV incidence per 1,000 (2021)	Estimated new infections (adults and children) (2021)	HIV prevalence (%) in general population age 15–49 (2021)	Cumulative number of new infections	Cumulative % of new infections
Nyando	5.62	534	20.16	534	17
Kisumu East	3.30	472	12.70	1007	32
Nyakach	5.09	463	17.30	1469	47
Kisumu Central	4.21	461	13.30	1931	62
Muhoroni	4.80	453	15.86	2384	76
Seme	5.40	390	19.49	2774	89
Kisumu West	3.12	344	11.94	3118	100

Each sub-county in Kisumu has a relatively high number—and hence a sizable share—of the county’s new infections. Due to the large estimates of new infections in all of its sub-counties, Kisumu is a priority county for HIV prevention (Figure 3).

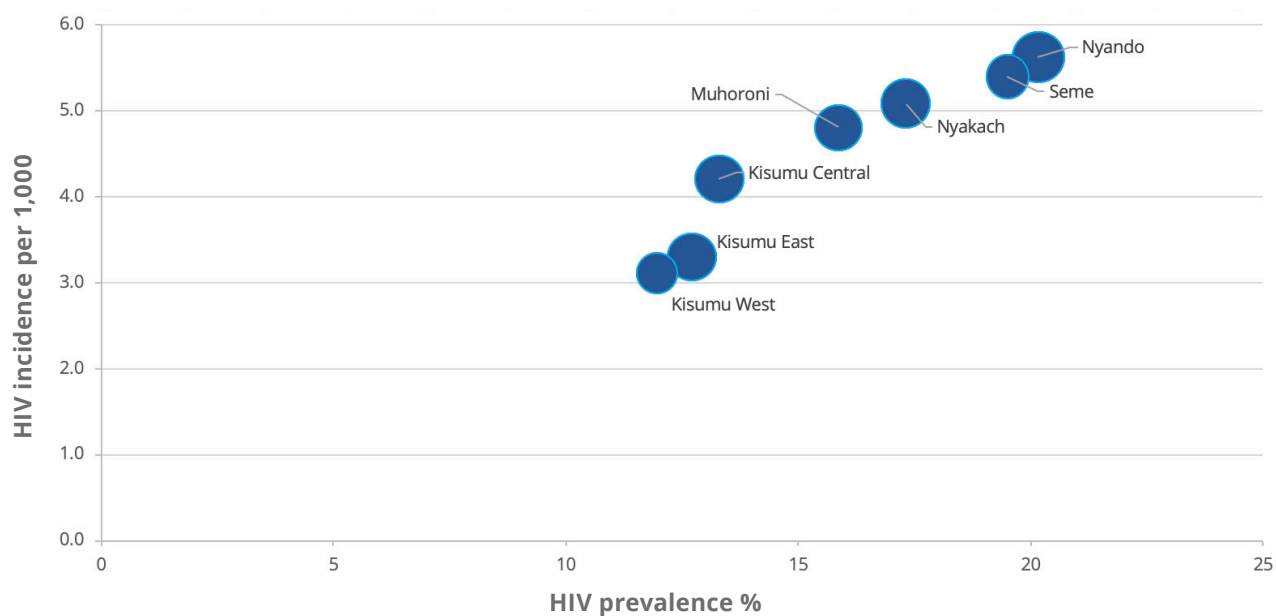
Figure 3. Estimated new HIV infections by sub-county, Kisumu County, 2021



The sub-counties themselves do not differ greatly in terms of the estimated number of new infections. Five of the seven sub-counties account for 75% of all new infections in Kisumu County.

Three sub-counties (Nyando, Kisumu East, and Nyakach) account for nearly half (47%) of all new infections in Kisumu County.

Figure 4. Kisumu County sub-counties by HIV prevalence and incidence, 2021



On all three counts—incidence, prevalence, and new infections—four sub-counties (Nyando, Nyakach, Muhoroni, and Seme) qualify as priority sub-counties within Kisumu County.

2.4.2 Mombasa

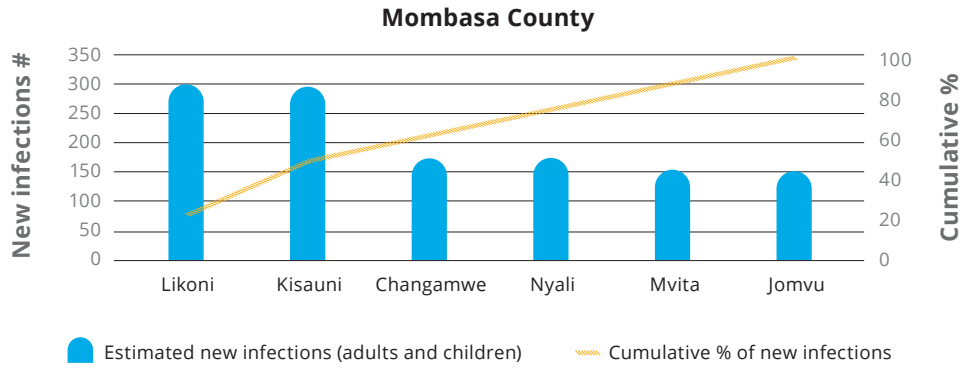
Table 3

HIV incidence, estimated new infections, and prevalence in the general population by sub-county, Mombasa County, 2021

County: MOMBASA					
Sub-county	HIV incidence per 1,000 (2021)	Estimated new infections (adults and children) (2021)	HIV prevalence (%) in general population age 15–49 (2021)	Cumulative number of new infections	Cumulative % of new infections
Likoni	1.60	294	5.80	294	24
Kisauni	1.29	289	5.45	583	47
Changamwe	1.81	174	7.94	757	61
Nyali	1.04	173	3.93	931	75
Mvita	1.42	162	5.22	1093	88
Jomvu	1.22	148	4.58	1241	100

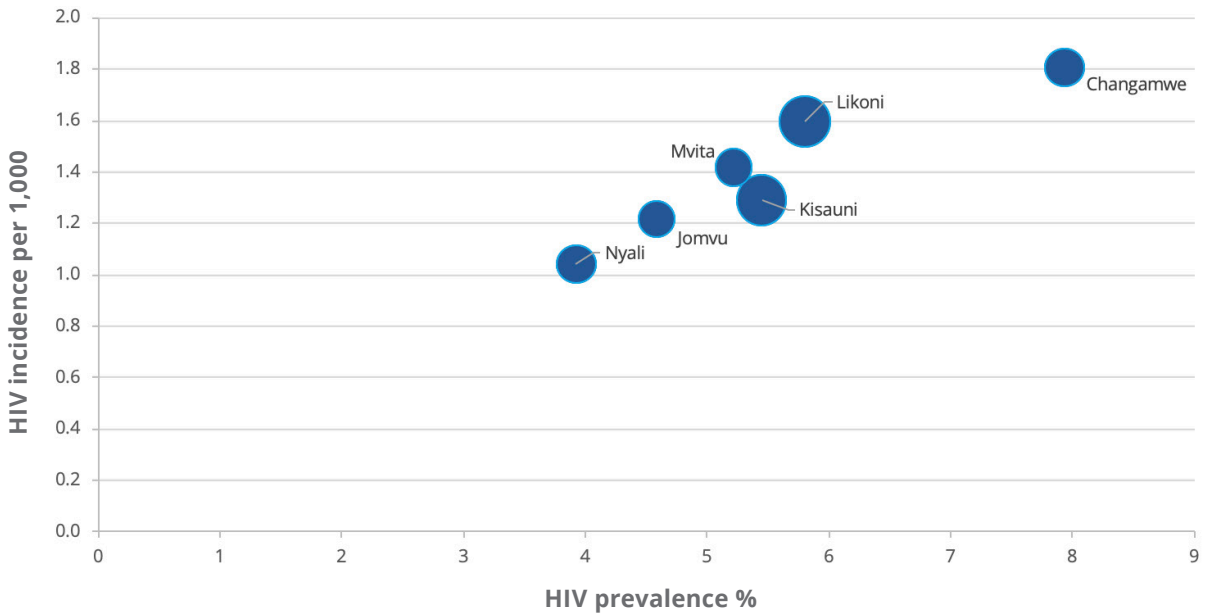
The HIV incidence and prevalence estimates are relatively moderate in all of the sub-counties of Mombasa County.

Figure 5. Estimated new HIV infections by sub-county, Mombasa County, 2021



Two of the six sub-counties (Likoni and Kisauni) account for nearly half of all new infections in Mombasa County.

Figure 6. Mombasa County sub-counties by HIV prevalence and incidence, 2021



On all three counts—incidence, prevalence, and new infections—three sub-counties (Changamwe, Likoni, and Kisauni) qualify as priority sub-counties within Mombasa County.

2.4.3 Nairobi

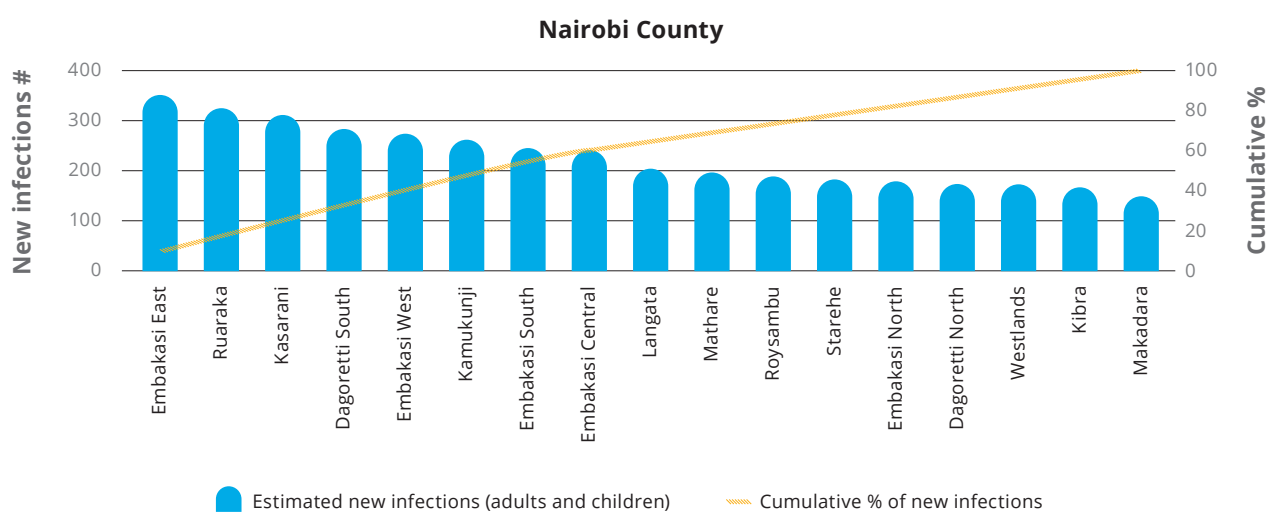
Table 4

HIV incidence, estimated new infections, and prevalence in the general population by sub-county, Nairobi County, 2021

County: NAIROBI					
Sub-county	HIV incidence per 1,000 (2021)	Estimated new infections (adults and children) (2021)	HIV prevalence (%) in general population age 15–49 (2021)	Cumulative number of new infections	Cumulative % of new infections
Embakasi East	1.49	347	5.68	347	9
Ruaraka	1.90	325	6.29	671	18
Kasarani	1.01	308	3.80	979	26
Dagoretti South	1.30	274	4.99	1254	33
Embakasi West	1.26	270	4.72	1523	40
Kamukunji	1.14	253	4.41	1777	46
Embakasi South	0.88	243	3.15	2019	53
Embakasi Central	1.21	233	4.69	2253	59
Langata	1.35	201	5.29	2454	64
Mathare	1.22	191	4.64	2645	69
Roysambu	0.78	182	2.97	2827	74
Starehe	1.11	178	4.25	3005	78
Embakasi North	1.34	174	5.17	3179	83
Dagoretti North	0.93	170	3.38	3348	87
Westlands	0.98	168	3.50	3516	92
Kibra	1.16	163	4.27	3680	96
Makadara	0.85	148	3.22	3828	100

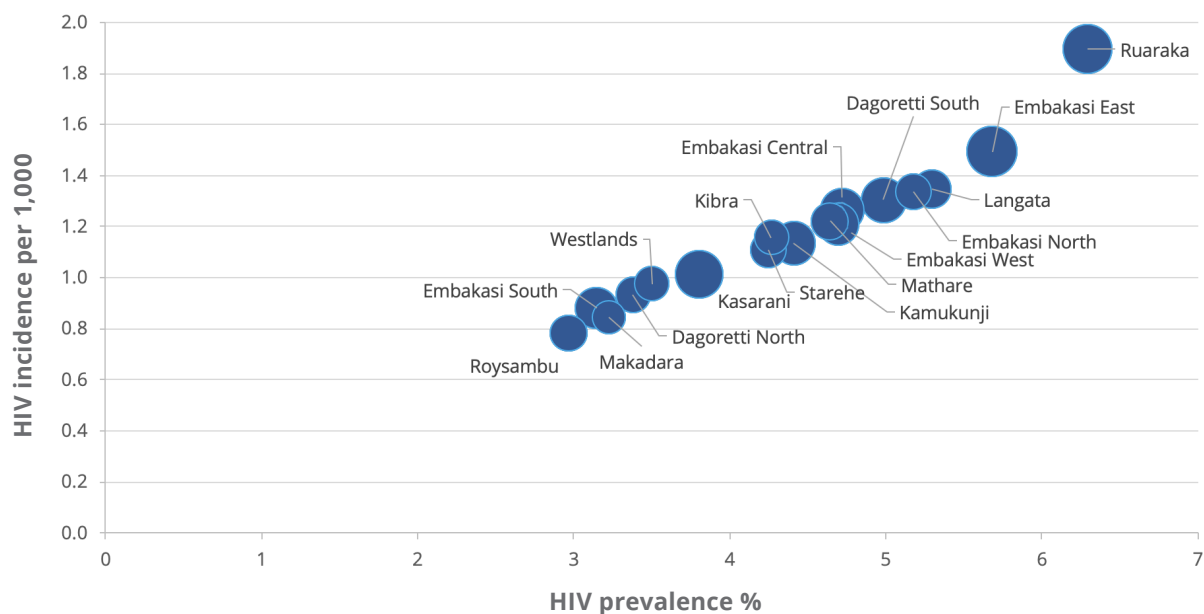
The HIV incidence and prevalence estimates range from relatively low to moderate across the 17 sub-counties of Nairobi County.

Figure 7. Estimated new HIV infections by sub-county, Nairobi County, 2021



Six sub-counties (Embakasi East, Ruaraka, Kasarani, Dagoretti South, Embakasi West, and Kamukunji) account for nearly half of all new infections in Nairobi County.

Figure 8. Nairobi County sub-counties by HIV prevalence and incidence, 2021



On all three counts—incidence, prevalence, and new infections—two sub-counties (Embakasi East and Ruaraka) qualify as priority sub-counties in Nairobi County. Kasarani qualifies as a priority sub-county because of its large number of estimated new infections, largely due to its large population.

2.4.4 Nakuru

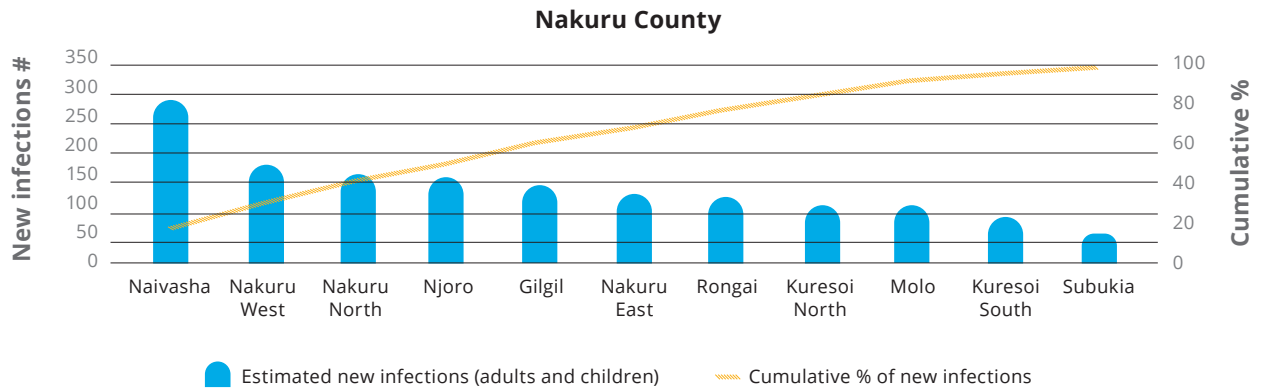
Table 5

HIV incidence, estimated new infections, and prevalence in the general population by sub-county, Nakuru County, 2021

County: NAKURU					
Sub-county	HIV incidence per 1,000 (2021)	Estimated new infections (adults and children) (2021)	HIV prevalence (%) in general population age 15–49 (2021)	Cumulative number of new infections	Cumulative % of new infections
Naivasha	1.03	289	4.17	289	19
Nakuru West	1.11	174	4.56	462	31
Nakuru North	0.96	159	3.52	621	42
Njoro	0.85	156	3.17	777	52
Gilgil	0.95	139	3.96	916	61
Nakuru East	0.83	127	3.18	1043	70
Rongai	0.76	120	2.98	1163	78
Kuresoi North	0.72	100	2.90	1263	84
Molo	0.81	100	2.86	1362	91
Kuresoi South	0.63	79	2.59	1441	96
Subukia	0.83	55	3.15	1496	100

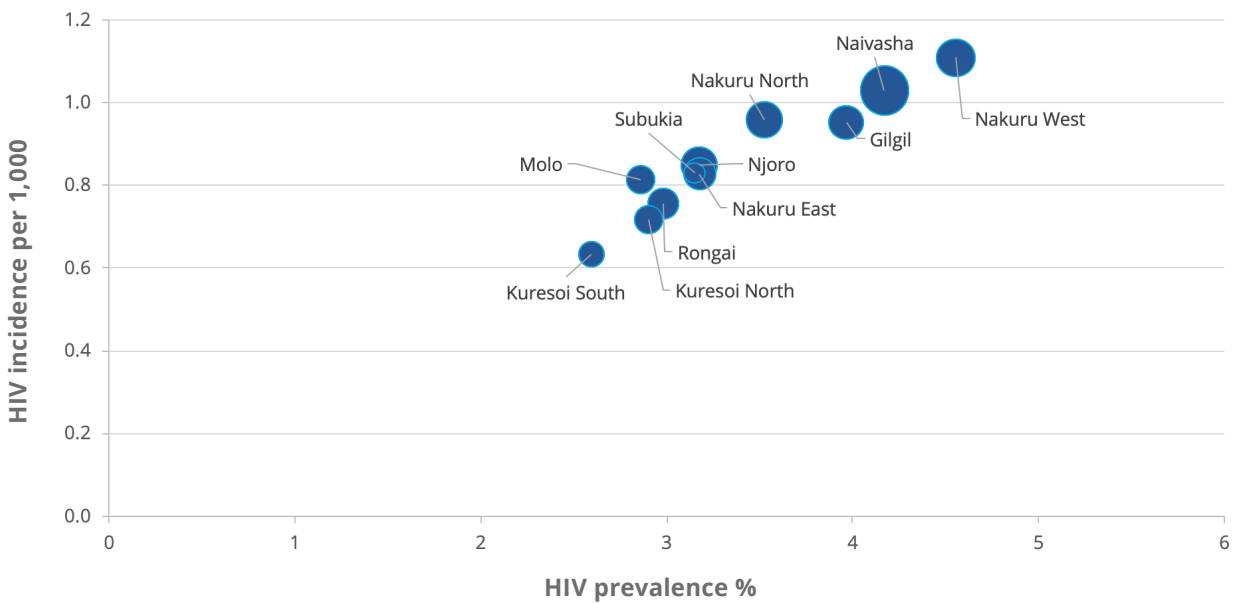
The HIV incidence and prevalence estimates range from relatively low to moderate across the 11 sub-counties of Nakuru County.

Figure 9. Estimated new HIV infections by sub-county, Nakuru County, 2021



Three sub-counties (Naivasha, Nakuru West, and Nakuru North) account for 40% of all new infections in Nakuru County.

Figure 10. Nakuru County sub-counties by HIV prevalence and incidence, 2021



On all three counts—incidence, prevalence, and new infections—four sub-counties (Nakuru West, Naivasha, Nakuru North, and Gilgil) qualify as priority sub-counties in Nakuru County.



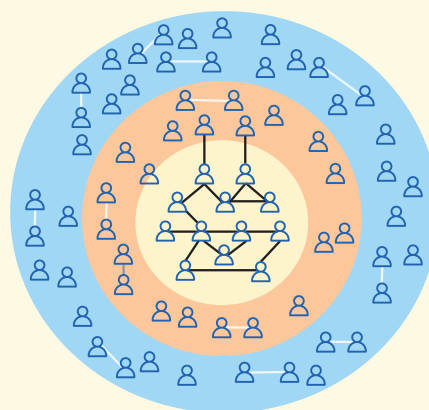
03

Epidemic typology

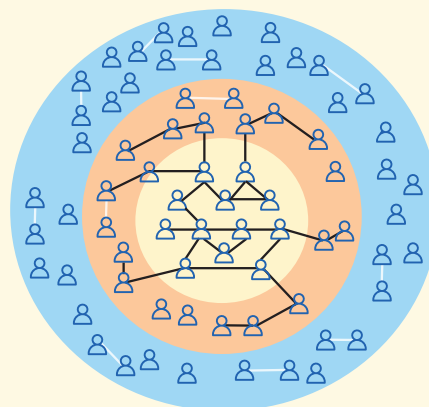
Determining the epidemic typology is necessary to prioritise the population groups for HIV prevention. For this epidemic appraisal, epidemic typologies may be described as concentrated, generalising, and mixed. The classification reflects the specific behaviours that are required for HIV to become established in a population (i.e., behaviours that must be present for each infection to lead, on average, to more than one new infection).⁷ Counties are categorised into epidemic types using the estimated size of local high-risk sexual networks and estimated HIV prevalence in the general population (GP) and key populations (KP) (i.e., female sex workers, men who have sex with men, and people who inject drugs).

Figure 11. HIV epidemic typologies

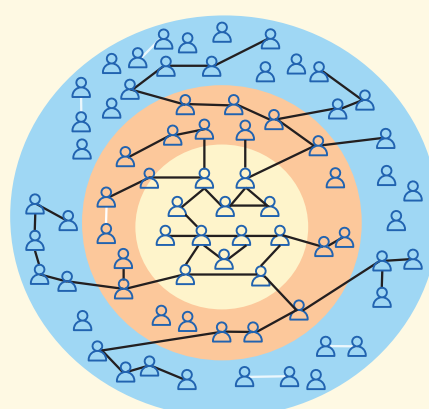
Concentrated epidemics are those where ongoing transmission is within subpopulations at higher risk due to sexual practices or needle-sharing networks. In all concentrated epidemics, the appropriate intervention is to scale up effective, focused HIV prevention programmes to reduce transmission in the high-risk networks. In addition, the intervention should maintain high coverage of pregnant women for HIV testing and ART for those living with HIV.



Mixed epidemics occur when there is a substantial contribution from the general population's sexual behaviour patterns and defined subpopulations at risk due to shared networks of higher risk practices. In a mixed epidemic, the programming focus should be on a dual strategy of changing sexual behaviour patterns in the general population and reducing transmission in the key and priority populations. In addition, intervention should maintain high coverage of pregnant women for HIV testing and ART for those living with HIV.



Generalising epidemics are where HIV transmission is mainly sustained by high-risk sexual behaviour in the general population, without any substantial contribution by defined subpopulations at risk. In all generalising epidemics, appropriate intervention should focus on changing sexual behaviour patterns in the general population. In particular, the focus should be on reducing multiple and concurrent partnerships and using other prevention measures, such as increasing the proportion of men who are circumcised, where relevant. Additionally, there should be high coverage of pregnant women for HIV testing and ART for those living with HIV.



Black coloured lines indicate high risk sexual or needle sharing contact between individuals

⁷Mishra S, Sgaier SK, Thompson LH et al. 2012. HIV Epidemic Appraisals for Assisting in the Design of Effective Prevention Programmes: Shifting the Paradigm Back to Basics. PLoS ONE 7(3): e32324. <https://doi.org/10.1371/journal.pone.0032324>

To determine which populations should be prioritised for HIV prevention, counties are classified by epidemic typology. Such classification uses three measures in the following order:

1. HIV prevalence in the general population,
2. HIV prevalence among the key populations, and
3. Density of key populations per 1000 adult men aged 15–64 years.

We use Spectrum/EPP/Naomi model estimates of HIV prevalence in the general population, the key population size estimates of 2020,⁸ number of men aged 15–64 years as per the population census of 2019, and estimates of HIV prevalence in key populations based on self-reported HIV status from the Polling Booth Surveys (PBS).⁹ Polling booth survey is a group interview method where the individual participants give their responses through a ballot box, thus keeping the individual responses anonymous and unlinked. This method is described elsewhere.¹⁰

The 2020 estimation of key populations, led by NASCOP, was conducted using several methods, including unique object multiplier, unique event multiplier, three source capture-recapture, service multiplier, successive sampling population size estimation, and anchored multiplier. Multiple indicator regression was used to estimate the population sizes for the counties, including those not included in the primary data collection. Stakeholder consensus meetings were conducted to build consensus and validate the size estimates. Though various methods were used for estimating the size of the key populations, in countries where sex work or same sex relationships are criminalised, like Kenya, it is always challenging to find accurate estimates. In Kenya, the population size estimates of men who have sex with men are below the global average, and therefore probably underestimate the actual population of adult men who have had sex with a man.¹¹

3.1 Data compilation/preparation

The following county-wise data, shown in Sheet “typology” of the “Toolkit_County” Excel Workbook are compiled from specified sources:

1. The latest HIV prevalence estimates among the key populations from any source, such as the Integrated Biological and Behavioural Surveys (IBBS) or from Polling Booth Surveys, may be considered. In this example, we have estimated HIV prevalence among the female sex workers, men who have sex with men, and people who inject drugs in each county based on the percentage of representative samples of key population members who reported HIV positivity in the PBS of 2017 in 12, 6, and 4 of the 47 counties, respectively. The county-wise prevalence was estimated using the regression method described in Annex 2. The estimated HIV prevalence among the female sex workers, men who have sex with men, and people who inject drugs are copied into Columns B, C, and D (Table 6).
2. HIV prevalence in the general population aged 15–49 for the most recent year, based on the model estimates. Here we have used the 2021 Spectrum/EPP/Naomi model-based estimates (Column E).
3. The most recent data on the key population (female sex workers, men who have sex with men, and people who inject drugs) size estimates. In this example, we have used the population estimates from 2020 (Columns F, G, and H, respectively).
4. The most recent estimates of county male population aged 15–64 years. In this example, the 2019 estimates from the Kenya National Bureau of Statistics are used (Column I).

⁸National AIDS & STI Control Programme. 2021. Key Population Size Estimates in Kenya, 2020: Final Report. Nairobi: NASCOP.

⁹National AIDS & STI Control Programme. 2018. Third National Behavioural Assessment of Key Populations in Kenya: Polling Booth Survey Report. Nairobi: NASCOP. <https://hivpreventioncoalition.unaids.org/wp-content/uploads/2020/02/Third-national-behavioural-assessment-of-key-populations-in-kenya-polling-booth-survey-report-october-2018-1.pdf>. PBS was conducted in selected counties. The data on self reported HIV status was extrapolated to estimate HIV prevalence in other counties.

¹⁰Lowndes CM, Jayachandran AA, Banandur P et al. 2012. Polling booth surveys: a novel approach for reducing social desirability bias in HIV-related behavioural surveys in resource-poor settings. *AIDS Behav.* 16(4):1054-62. doi: 10.1007/s10461-011-0004-1

¹¹World Health Organization and UNAIDS. 2020. Recommended Population Size Estimates of Men who Have Sex with Men. Key Populations Strategic Information, Technical Brief. Geneva: WHO. https://www.unaids.org/sites/default/files/media_asset/2020-recommended-population-size-estimates-of-men-who-have-sex-with-men_en.pdf

Note that the counties are arranged in alphabetical order, and make sure that while copying the numbers for each county, the source data is sorted according to the county name in ascending order.

Table 6

Estimated HIV prevalence among the key and general populations, key population size estimates, and number of men aged 15–64 by county

A County	B C D E HIV prevalence				F G H Size estimation			I # of men aged 15–64 (2019)
	FSWs	MSM	PWID	GP	FSWs	MSM	PWID	
Baringo	20.6	9.5	18.8	1.65	1970	568	339	304283
Bomet	22.0	8.7	19.1	2.40	2603	409	582	378384
Bungoma	21.6	11.5	19.0	2.45	3716	1353	413	709477
Busia	32	9.6	21.1	5.44	2421	550	281	375460
Elgeyo-Marakwet	23	8.7	19.3	2.02	1268	186	291	192705
Embu	21.8	8.8	19.1	2.17	1851	427	0	250995
Garissa	18.0	10.6	18.3	0.17	2149	1285	299	372577
Homa Bay	46.1	9.0	23.8	16.18	3823	983	55	472653
Isiolo	21.1	9.0	18.9	1.85	688	346	817	106722
Kajiado	25	11.3	19.6	3.53	7645	1759	436	502012
Kakamega	24	10.6	19.4	3.58	3525	1378	329	697033
Kericho	23	9.5	19.3	3.24	2333	605	180	408197
Kiambu	19.5	21.7	18.6	2.27	5809	2580	1045	974052
Kilifi	21.3	14.0	19.0	2.78	6696	4589	3168	560175
Kirinyaga	23	8.5	19.2	2.51	2497	437	381	265475
Kisii	27	9.4	20.0	4.66	6538	885	29	548342
Kisumu	43.1	13.3	23.2	15.47	5277	4025	390	436471
Kitui	26	9.5	19.9	3.29	2972	500	387	473911
Kwale	24	9.8	19.5	3.11	2833	1026	1127	340884
Laikipia	20.8	9.2	18.9	2.23	1182	231	375	217396
Lamu	21.7	8.9	19.0	2.26	749	211	450	58800
Machakos	23	13.4	19.3	3.02	4932	2811	40	606200
Makueni	24	9.2	19.4	2.80	2743	893	399	417516
Mandera	18.3	10.2	18.4	0.41	3952	1052	519	334116
Marsabit	19.7	9.2	18.6	0.86	1530	476	392	163831
Meru	23	8.6	19.3	2.54	2743	1026	60	689904
Migori	36.6	9.6	21.9	10.38	5238	782	153	451003
Mombasa	26	14.0	19.9	5.37	8187	3117	1992	584223
Murang'a	22.3	10.0	19.1	2.41	2532	904	412	503446
Nairobi	23	28.2	19.4	4.32	39227	15271	4198	1946605
Nakuru	22.3	12.5	19.1	3.46	17708	2706	9	943905
Nandi	21.7	9.4	19.0	2.79	2957	514	661	409924
Narok	25	8.6	19.7	2.88	3107	704	403	491806
Nyamira	24	8.7	19.4	3.75	1999	193	654	249419
Nyandarua	21.1	9.1	18.9	2.00	1785	403	257	256290

A County	B	C	D	E	F	G	H	I
	HIV prevalence				Size estimation			# of men aged 15–64 (2019)
	FSWs	MSM	PWID	GP	FSWs	MSM	PWID	
Nyeri	25	9.3	19.7	2.97	1317	406	0	351923
Samburu	20.7	8.6	18.8	4.59	1500	150	488	127499
Siaya	39.9	9.8	22.6	14.06	3724	593	567	395261
Taita-Taveta	25	8.7	19.8	3.46	1843	219	514	162194
Tana River	19.5	8.7	18.6	1.05	1798	212	524	136706
Tharaka-Nithi	21.4	8.8	19.0	2.52	2594	219	568	182257
Trans-Nzoia	24	10.3	19.4	3.39	3147	1114	180	392992
Turkana	28	9.4	20.2	3.10	3722	515	609	375575
Uasin Gishu	26	11.2	19.8	3.95	2886	1693	676	540844
Vihiga	25.6	9.5	19.8	4.58	1940	203	407	240413
Wajir	18.3	9.9	18.4	0.16	3139	860	0	296110
West Pokot	19.8	8.9	18.7	0.83	2304	281	617	264694

3.2 Data analysis

3.2.1 Standardising key population estimates

The key population size estimates are standardised across counties by creating a new variable called key population members per 1,000 men aged 15–64 years. This is done through the following steps:

1. The total number of key population members in the county is computed in Column J by summing the numbers of female sex workers, men who have sex with men, and people who inject drugs in Columns F, G, and H, respectively, for each county. For this, the formula $F6+G6+H6$ is inserted into cell J6 and this is copied all the way down to cell J52.
2. Number of key population members per 1,000 men aged 15–64 years is computed in Column K by dividing the total key population members (Column J) by the number of men aged 15–64 years (Column I) and multiplying the product with 1,000. For this, the formula $J6/I6*1000$ is inserted into cell K6, and this is copied all the way down to cell K52.

Table 7

Total key population and key population members per 1,000 men aged 15–64 by county

A County	J Total KP members (Col F + G + H)	K # of KP members per 1,000 men aged 15–64 years (Col J / Col I * 1000)
Baringo	2877	9
Bomet	3594	9
Bungoma	5482	8
Busia	3252	6
Elgeyo-Marakwet	1745	5
Embu	2278	12
Garissa	3733	15

A	J	K
County	Total KP members (Col F + G + H)	# of KP members per 1,000 men aged 15–64 years (Col J / Col I * 1000)
Homa Bay	4861	15
Isiolo	1851	5
Kajiado	9840	20
Kakamega	5232	3
Kericho	3118	3
Kiambu	9434	20
Kilifi	14452	35
Kirinyaga	3315	31
Kisii	7452	15
Kisumu	9692	59
Kitui	3859	15
Kwale	4986	19
Laikipia	1788	4
Lamu	1410	4
Machakos	7783	11
Makueni	4035	10
Mandera	5523	6
Marsabit	2398	4
Meru	3829	14
Migori	6173	9
Mombasa	13296	104
Murang'a	3848	7
Nairobi	58696	148
Nakuru	20423	126
Nandi	4132	9
Narok	4214	9
Nyamira	2846	21
Nyandarua	2445	7
Nyeri	1723	8
Samburu	2138	12
Siaya	4884	11
Taita-Taveta	2576	7
Tana River	2534	43
Tharaka-Nithi	3380	9
Trans-Nzoia	4441	8
Turkana	4846	20
Uasin Gishu	5255	18
Vihiga	2550	10
Wajir	3999	7
West Pokot	3202	8

In Table 9, the epidemic typology for each county is described in Column L, based on the values in Columns B, C, D, E and K. Accordingly, 25 counties can be classified as having concentrated epidemics, 18 counties as having mixed epidemics, and four counties as having generalising epidemics.

Table 9

HIV prevalence among general and key populations, key population members per 1,000 adult men, and epidemic typology by county

A County	BIV prevalence			E GP	K KP per 1,000 adult men	L Epidemic typology
	B FSWs	C MSM	D PWID			
Baringo	20.6	9.5	18.8	1.65	9	Concentrated
Bomet	22.0	8.7	19.1	2.40	9	Concentrated
Bungoma	21.6	11.5	19.0	2.45	8	Concentrated
Busia	32	9.6	21.1	5.44	6	Mixed
Elgeyo-Marakwet	23	8.7	19.3	2.02	5	Concentrated
Embu	21.8	8.8	19.1	2.17	12	Concentrated
Garissa	18.0	10.6	18.3	0.17	15	Concentrated
Homa Bay	46.1	9.0	23.8	16.18	15	Generalizing
Isiolo	21.1	9.0	18.9	1.85	5	Concentrated
Kajiado	25	11.3	19.6	3.53	20	Mixed
Kakamega	24	10.6	19.4	3.58	3	Mixed
Kericho	23	9.5	19.3	3.24	3	Mixed
Kiambu	19.5	21.7	18.6	2.27	20	Concentrated
Kilifi	21.3	14.0	19.0	2.78	35	Concentrated
Kirinyaga	23	8.5	19.2	2.51	31	Concentrated
Kisii	27	9.4	20.0	4.66	15	Mixed
Kisumu	43.1	13.3	23.2	15.47	59	Generalizing
Kitui	26	9.5	19.9	3.29	15	Mixed
Kwale	24	9.8	19.5	3.11	19	Mixed
Laikipia	20.8	9.2	18.9	2.23	4	Concentrated
Lamu	21.7	8.9	19.0	2.26	4	Concentrated
Machakos	23	13.4	19.3	3.02	11	Mixed
Makueni	24	9.2	19.4	2.80	10	Concentrated
Mandera	18.3	10.2	18.4	0.41	6	Concentrated
Marsabit	19.7	9.2	18.6	0.86	4	Concentrated
Meru	23	8.6	19.3	2.54	14	Concentrated
Migori	36.6	9.6	21.9	10.38	9	Generalizing
Mombasa	26	14.0	19.9	5.37	104	Mixed
Murang'a	22.3	10.0	19.1	2.41	7	Concentrated
Nairobi	23	28.2	19.4	4.32	148	Mixed
Nakuru	22.3	12.5	19.1	3.46	126	Mixed
Nandi	21.7	9.4	19.0	2.79	9	Concentrated
Narok	25	8.6	19.7	2.88	9	Concentrated
Nyamira	24	8.7	19.4	3.75	21	Mixed
Nyandarua	21.1	9.1	18.9	2.00	7	Concentrated

A County	B	C	D	E	K KP per 1,000 adult men	L Epidemic typology
	HIV prevalence			GP		
	FSWs	MSM	PWID	GP		
Nyeri	25	9.3	19.7	2.97	8	Concentrated
Samburu	20.7	8.6	18.8	4.59	12	Mixed
Siaya	39.9	9.8	22.6	14.06	11	Generalizing
Taita-Taveta	25	8.7	19.8	3.46	7	Mixed
Tana River	19.5	8.7	18.6	1.05	43	Concentrated
Tharaka-Nithi	21.4	8.8	19.0	2.52	9	Concentrated
Trans-Nzoia	24	10.3	19.4	3.39	8	Mixed
Turkana	28	9.4	20.2	3.10	20	Mixed
Uasin Gishu	26	11.2	19.8	3.95	18	Mixed
Vihiga	25.6	9.5	19.8	4.58	10	Mixed
Wajir	18.3	9.9	18.4	0.16	7	Concentrated
West Pokot	19.8	8.9	18.7	0.83	8	Concentrated

3.2.3 Classifying sub-counties by epidemic typology

Within the counties, sub-counties can also be classified by epidemic typology. However, we need to use a slightly different matrix (shown in Table 10) for classifying the sub-counties, because HIV prevalence data for key populations is not available by sub-counties. We used the following criteria for classifying sub-counties:

Table 10

Epidemic classification matrix for sub-counties

GP Prevalence	Low (<3%)			Medium (3%–9%)			High (10%+)		
KP Density	L (<20%)	M (20%–29%)	H (30%+)	L (<20%)	M (20%–29%)	H (30%+)	L (<20%)	M (20%–29%)	H (30%+)
	Concentrated	Concentrated	Mixed	Mixed	Mixed	Mixed	Mixed	Generalising	Generalising

HIV prevalence in the general population aged 15–49 as well as the key population density in terms of the number of key population members per 1,000 adult men aged 15–64 are compiled for each sub-county in the Sheet “typology” in the “Toolkit_Subcounty” Excel Workbook. For the epidemic classification of the sub-counties, we used the key population size estimates of 2020, which were available only at the county level, redistributed equally across the sub-counties. Although the key population size estimates of 2018 provide sub-county level estimates in 35 of the 47 counties, we could not use that data because the estimated numbers of key population members at the sub-county level in 2018 do not match the 2020 estimates for the county due to differences in estimation methods. Hence, the density of key populations at the sub-county level needs to be interpreted cautiously. **During the sub-county level epidemic appraisal, efforts should be made to get the best estimates of the key populations for the sub-counties.**

Also, for some sub-counties, the Kenya Census does not provide the population separately, so the number of men aged 15–64 is missing. For example, in Nairobi County, only eight of the 17 sub-counties have the population of men aged 15–64 available from the census. Therefore, the epidemic typology in the sub-counties with missing data cannot be determined.

The epidemic classification of sub-counties in four counties (Kisumu, Mombasa, Nairobi, and Nakuru) is presented in Table 11. The epidemic typology of some sub-counties is different from the epidemic typology of the county, examples being sub-counties in Kisumu and Nakuru Counties.

Table 11

General population HIV prevalence, key population size estimates, key population members per 1,000 men, and epidemic typology by sub-county in Kisumu, Mombasa, Nairobi, and Nakuru Counties

Sub-county	GP HIV prevalence	Key population size estimates			# of men aged 15–64	Total KP members	# of KP members per 1,000 men aged 15–64 years	Epidemic typology	
		FSWs	MSM	PWID				County	Sub-County
County: KISUMU									
Kisumu Central	13.30	754	575	56	61408	1385	23	Generalising	Generalising
Kisumu East	12.70	754	575	56	72968	1385	19		Mixed
Kisumu West	11.94	754	575	56	56503	1385	25		Generalising
Muhoroni	15.86	754	575	56	47483	1385	29		Generalising
Nyakach	17.30	754	575	56	40453	1385	34		Generalising
Nyando	20.16	754	575	56	45589	1385	30		Generalising
Seme	19.49	754	575	56	32803	1385	42		Generalising
County: MOMBASA									
Changamwe	7.94	1365	520	332	53803	2216	41	Mixed	Mixed
Jomvu	4.58	1365	520	332	60080	2216	37		Mixed
Kisauni	5.45	1365	520	332	106297	2216	21		Mixed
Likoni	5.80	1365	520	332	92906	2216	24		Mixed
Mvita	5.22	1365	520	332	56474	2216	39		Mixed
Nyali	3.93	1365	520	332	82807	2216	27		Mixed
County: NAIROBI									
Dagoretti North	3.38	2615	1018	280		3913		Mixed	
Dagoretti South	4.99	2615	1018	280		3913			
Embakasi Central	4.69	2615	1018	280		3913			
Embakasi East	5.68	2615	1018	280		3913			
Embakasi North	5.17	2615	1018	280		3913			
Embakasi South	3.15	2615	1018	280		3913			
Embakasi West	4.72	2615	1018	280		3913			
Kamukunji	4.41	2615	1018	280	102862	3913	38		Mixed
Kasarani	3.80	2615	1018	280	288917	3913	14		Mixed
Kibra	4.27	2615	1018	280	72202	3913	54		Mixed
Langata	5.29	2615	1018	280	76738	3913	51		Mixed
Makadara	3.22	2615	1018	280	76809	3913	51		Mixed

Sub-county	GP HIV prevalence	Key population size estimates			# of men aged 15–64	Total KP members	# of KP members per 1,000 men aged 15–64 years	Epidemic typology	
		FSWs	MSM	PWID				County	Sub-County
Mathare	4.64	2615	1018	280	82641	3913	47		Mixed
Roysambu	2.97	2615	1018	280		3913			
Ruaraka	6.29	2615	1018	280		3913			
Starehe	4.25	2615	1018	280	90487	3913	43		Mixed
Westlands	3.50	2615	1018	280	122455	3913	32		Mixed
County: NAKURU									
Gilgil	3.96	1610	246	1	61859	1856	30	Mixed	Mixed
Kuresoi North	2.90	1610	246	1	51061	1856	36		Mixed
Kuresoi South	2.59	1610	246	1	45833	1856	41		Mixed
Molo	2.86	1610	246	1	49483	1856	38		Mixed
Naivasha	4.17	1610	246	1	126391	1856	15		Mixed
Nakuru East	3.18	1610	246	1	66677	1856	28		Mixed
Nakuru North	3.52	1610	246	1	70330	1856	26		Mixed
Nakuru West	4.56	1610	246	1	74888	1856	25		Mixed
Njoro	3.17	1610	246	1	72191	1856	26		Mixed
Rongai	2.98	1610	246	1	65575	1856	28		Concentrated
Subukia	3.15	1610	246	1	25761	1856	72		Mixed

3.3 How this analysis can be used for prioritising populations and geographies

The mix of prevention strategies may vary according to the epidemic typology (Figure 12). In Kenya, stakeholders, based on their experience and understanding of population behaviours, risks and vulnerabilities decided that in all counties, irrespective of epidemic typology, the strategy should be high coverage of a) HIV testing for pregnant women and treatment for pregnant women living with HIV, b) HIV prevention and treatment for key populations and their sexual and injecting partners, and c) treatment for people living with HIV. In mixed epidemics, it is additionally appropriate to scale up effective and focused HIV prevention programmes to reduce transmission in other priority populations, such as adolescent girls and young women (AGYW) and adolescent boys and young men (ABYM). In generalising epidemics, it is additionally appropriate to focus on reducing multiple and concurrent partnerships and using other prevention measures among vulnerable populations, like fisherfolk and long-distance truckers.¹²

¹²National Syndemic Diseases Control Council. 2023. National Multisectoral HIV Prevention Acceleration Plan 2023–2030. Nairobi: NSDCC. <https://nsdcc.go.ke/download/national-multisectoral-hiv-prevention-acceleration-plan-2023-2030/>

Figure 12. Suggested programmatic focus according to epidemic typology

Concentrated epidemics

Programmatic focus

- Scale up effective and focused HIV prevention programmes to reduce transmission in the high-risk networks.
- Focus on high coverage of pregnant women for HIV testing and ART for those who are living with HIV.
- Scale up and saturate coverage of key populations.
- Ensure that people living with HIV are virally suppressed.



Mixed epidemics

Programmatic focus

- Focus on high risk networks and other populations at risk in the general population.
- Scale up and maintain high coverage of pregnant women for HIV testing and ART for those who are living with HIV.
- Scale up and saturate coverage of key populations.
- Ensure that people living with HIV are virally suppressed.
- Scale up coverage of adolescent girls and young women and young boys and men (specially in traditionally non-circumcising counties).



Generalising epidemics

Programmatic focus

- Focus on changing sexual behaviour patterns in the general population. The focus should be on reducing multiple and concurrent partnerships.
- Scale up and maintain high coverage of pregnant women for HIV testing and ART for those who are living with HIV.
- Scale up and saturate coverage of key populations.
- Ensure that people living with HIV are virally suppressed.
- Scale up coverage of adolescent girls and young women.
- Increase the proportion of boys and men who are circumcised.
- Identify the vulnerable populations and saturate coverage of these subpopulations.





04

Programme coverage gaps

Lastly, the epidemic appraisal includes analysis of routine programme monitoring data to assess the programme coverage gaps. In this toolkit, we describe the steps for analysing coverage gaps in five HIV prevention programmes: (1) Prevention of Mother-to-Child Transmission (PMTCT) Programme, (2) Key Populations Programme, (3) Adolescents and Young People (AYP) Programme, (4) Voluntary Medical Male Circumcision (VMMC) Programme, and (5) Antiretroviral Therapy (ART) Programme. We use routine programme monitoring data for the year 2021. The coverage indicators used for assessing the HIV prevention programmes are described in Table 12. The quality of routine monitoring data used for measuring prevention programme coverage gaps is expected to vary across counties in terms of accuracy, completeness, and consistency.^{13,14}

Table 12

Details of indicators used to measure coverage gaps in HIV prevention programmes

Programme	Coverage indicator	Numerator (source)	Denominator (source)
Prevention of Mother-to-Child Transmission Programme	% of estimated pregnant women tested for HIV	# of pregnant women tested for HIV (Kenya Health Information System (KHIS), January to December 2021)	Estimated # of pregnant women (Spectrum/EPP/Naomi model estimates for 2021)
	% of estimated HIV-positive pregnant women on anti-retroviral therapy	# of HIV-positive pregnant women on ART (KHIS, January to December 2021)	Estimated HIV-positive pregnant women (Spectrum/EPP/Naomi model estimates for 2021)
Key Populations Programme (separately for female sex workers, men who have sex with men, and people who inject drugs)	% of FSWs/MSM/PWID who received at least one service in the last quarter	# of FSWs/MSM/PWID who received at least one service in the last quarter (KHIS, quarter ending December 2021)	# of FSWs/MSM/PWID (Key population size estimation report, 2020)
Adolescents and Young People Programme	% of AGYW/ABYM aged 15–24 years tested for HIV in the year	# of AGYW/ABYM aged 15–24 years tested for HIV in the year (KHIS, 2021)	# of AGYW/ABYM aged 15–24 in need of HIV prevention services (estimated by UNAIDS in 2021)
Voluntary Medical Male Circumcision Programme	% of men and boys who underwent circumcision in the year	# of men and boys who underwent circumcision (KHIS, 2021)	# of men and boys uncircumcised (estimated based on the Kenya Population-based HIV Impact Assessment – KENPHIA 2018)
Antiretroviral Therapy Programme	% of people living with HIV who know their HIV status	# of people who know their HIV status (Estimates from DHIS 2021)	# of people living with HIV (Estimates from DHIS 2021)
	% of people living with HIV who are on treatment	# of people living with HIV who are on ART (DHIS 2021)	
	% of people living with HIV who have a suppressed viral load	# of people living with HIV who are virally suppressed (DHIS 2021)	

¹³McClarty LM, Bhattacharjee P, Isac S et al. 2018. Key Programme Science lessons from an HIV prevention 'Learning Site' for sex workers in Mombasa, Kenya. *Sexually Transmitted Infections*. 94:346-352. doi: 10.1136/sextrans-2017-053228

¹⁴Bhattacharjee P, Musyoki H, Prakash R et al. 2018. Micro-planning at scale with key populations in Kenya: Optimising peer educator ratios for programme outreach and HIV/STI service utilisation. *PLoS ONE* 13(11): e0205056. <https://doi.org/10.1371/journal.pone.0205056>

We measure the contact coverage through testing coverage (i.e., percentage of estimated pregnant women tested for HIV) and ART coverage (i.e., percentage of estimated HIV-positive pregnant women on ART).

4.1.1 Data compilation/preparation

The county-wise data in Tables 13 and 14, also shown in Sheet “pmtct” of the “Toolkit_County” Excel Workbook, are compiled from specified sources:

1. The most recent county-wise estimates of pregnancies. In this example, the estimated number of pregnant women for 2021 based on the Spectrum/EPP/Naomi model is used (Column B).
2. The most recent data on county-wise number of pregnant women tested for HIV at antenatal care (ANC), during labour and delivery, or during postnatal checkup. In this example, we have used this data for January to December 2021, available in the KHIS (Column C).
3. The most recent Spectrum/EPP/Naomi model-based county-wise estimates of PMTCT need. That is, the number of pregnant women who would need ART (Column D).
4. The most recent county-wise number of HIV-positive pregnant women who are on ART. Here we have used the data for January to December 2021, available in the KHIS (Column E).

Table 13

Estimated number of pregnancies, pregnant women tested for HIV, estimated PMTCT need, and HIV-positive pregnant women on ART by county, 2021

A	B	C	D	E
County	Estimated number of pregnancies (2021)	# of pregnant women tested for HIV at ANC, L&D, or PNC (Jan-Dec 2021)	Estimated PMTCT need (2021)	# of HIV-positive pregnant women on ART (2021)
Baringo	24263	14879	280	177
Bomet	29444	23262	557	382
Bungoma	63918	45748	1405	1247
Busia	30407	25780	1699	1278
Elgeyo-Marakwet	17668	13060	243	177
Embu	16323	13652	306	319
Garissa	38869	12488	111	47
Homa Bay	42558	29240	5474	4691
Isiolo	7027	4845	89	110
Kajiado	40540	34997	1102	746
Kakamega	67466	39989	2355	1572
Kericho	29426	21103	807	585
Kiambu	68245	55199	1498	1395
Kilifi	57052	40093	1010	995
Kirinyaga	14217	15141	439	364
Kisii	41476	29639	1934	1189
Kisumu	43362	29576	5866	3931
Kitui	35572	20726	761	437
Kwale	37480	21565	642	548
Laikipia	17996	15395	334	290

A	B	C	D	E
County	Estimated number of pregnancies (2021)	# of pregnant women tested for HIV at ANC, L&D, or PNC (Jan-Dec 2021)	Estimated PMTCT need (2021)	# of HIV-positive pregnant women on ART (2021)
Lamu	5155	4358	87	65
Machakos	35699	26403	965	718
Makueni	25129	18958	596	553
Mandera	32821	10997	162	18
Marsabit	16770	6764	72	42
Meru	48586	27299	858	554
Migori	51013	32577	3438	3324
Mombasa	41290	35782	1866	1491
Murang'a	26954	24209	693	476
Nairobi	164489	128405	7217	6252
Nakuru	76232	64266	2142	1792
Nandi	26798	20482	680	413
Narok	48641	43473	776	525
Nyamira	22511	16968	756	477
Nyandarua	17327	14378	337	359
Nyeri	18431	15099	536	335
Samburu	13472	7270	329	65
Siaya	33361	21628	4395	4014
Taita-Taveta	9970	9686	342	310
Tana River	11813	6562	75	56
Tharaka-Nithi	12207	10204	219	179
Trans-Nzoia	33554	26528	885	761
Turkana	43837	36330	720	544
Uasin Gishu	40227	35585	1327	967
Vihiga	19804	12805	969	617
Wajir	26568	7165	64	10
West Pokot	31900	16927	117	138

4.1.2 Data analysis

The following two indicators are computed (as shown in Columns F and G in Sheet “pmtct” of the “Toolkit_ County” Excel Workbook:

1. The percentage of estimated pregnant women tested for HIV is computed in Column F, wherein the numerator is the number of pregnant women tested for HIV (Column C) and the denominator is the estimated number of pregnancies (Column B). For this, the formula $C2/B2\%$ is inserted into cell F2, and this is copied all the way down to cell F48.
2. The percentage of estimated HIV-positive pregnant women on ART is computed in Column G wherein the numerator is the number of HIV-positive pregnant women on ART (Column E) and the denominator is the estimated PMTCT need (Column D). For this, the formula $E2/D2\%$ is inserted into cell G2 and this is copied all the way down to cell G48.

Table 14

Estimated number of pregnancies, pregnant women tested for HIV, estimated PMTCT need, HIV-positive pregnant women on ART, % of pregnant women tested for HIV, and % of estimated HIV-positive pregnant women on ART by county, 2021

A	B	C	D	E	F	G
County	Estimated number of pregnancies (2021)	# of pregnant women tested for HIV (Jan-Dec 2021)	Estimated PMTCT need (2021)	# of HIV-positive pregnant women on ART (2021)	% of estimated pregnant women tested for HIV	% of estimated HIV-positive pregnant women on ART
Baringo	24263	14879	280	177	61.3	63.3
Bomet	29444	23262	557	382	79.0	68.6
Bungoma	63918	45748	1405	1247	71.6	88.8
Busia	30407	25780	1699	1278	84.8	75.2
Elgeyo-Marakwet	17668	13060	243	177	73.9	72.8
Embu	16323	13652	306	319	83.6	104.2
Garissa	38869	12488	111	47	32.1	42.5
Homa Bay	42558	29240	5474	4691	68.7	85.7
Isiolo	7027	4845	89	110	68.9	123.6
Kajiado	40540	34997	1102	746	86.3	67.7
Kakamega	67466	39989	2355	1572	59.3	66.7
Kericho	29426	21103	807	585	71.7	72.4
Kiambu	68245	55199	1498	1395	80.9	93.2
Kilifi	57052	40093	1010	995	70.3	98.5
Kirinyaga	14217	15141	439	364	106.5	82.9
Kisii	41476	29639	1934	1189	71.5	61.5
Kisumu	43362	29576	5866	3931	68.2	67.0
Kitui	35572	20726	761	437	58.3	57.5
Kwale	37480	21565	642	548	57.5	85.3
Laikipia	17996	15395	334	290	85.5	86.9
Lamu	5155	4358	87	65	84.5	74.5
Machakos	35699	26403	965	718	74.0	74.4
Makueni	25129	18958	596	553	75.4	92.7
Mandera	32821	10997	162	18	33.5	11.1
Marsabit	16770	6764	72	42	40.3	58.7
Meru	48586	27299	858	554	56.2	64.5
Migori	51013	32577	3438	3324	63.9	96.7
Mombasa	41290	35782	1866	1491	86.7	79.9
Murang'a	26954	24209	693	476	89.8	68.7
Nairobi	164489	128405	7217	6252	78.1	86.6
Nakuru	76232	64266	2142	1792	84.3	83.7
Nandi	26798	20482	680	413	76.4	60.7
Narok	48641	43473	776	525	89.4	67.6
Nyamira	22511	16968	756	477	75.4	63.1
Nyandarua	17327	14378	337	359	83.0	106.6
Nyeri	18431	15099	536	335	81.9	62.6
Samburu	13472	7270	329	65	54.0	19.8

A	B	C	D	E	F	G
County	Estimated number of pregnancies (2021)	# of pregnant women tested for HIV (Jan-Dec 2021)	Estimated PMTCT need (2021)	# of HIV-positive pregnant women on ART (2021)	% of estimated pregnant women tested for HIV	% of estimated HIV-positive pregnant women on ART
Siaya	33361	21628	4395	4014	64.8	91.3
Taita-Taveta	9970	9686	342	310	97.2	90.7
Tana River	11813	6562	75	56	55.5	74.6
Tharaka-Nithi	12207	10204	219	179	83.6	81.6
Trans-Nzoia	33554	26528	885	761	79.1	86.0
Turkana	43837	36330	720	544	82.9	75.6
Uasin Gishu	40227	35585	1327	967	88.5	72.9
Vihiga	19804	12805	969	617	64.7	63.7
Wajir	26568	7165	64	10	27.0	15.5
West Pokot	31900	16927	117	138	53.1	118.1

4.1.3 Data presentation and interpretation

PMTCT Programme gaps at the county level

HIV testing gaps among pregnant women (Figure 13)

Figure 13 primarily uses data on the estimated number of pregnancies (Column B) and the percentage of estimated pregnant women tested for HIV (Column F) in Sheet “pmtct” in “Toolkit_County” Excel Workbook. For creating this figure, copy Sheet “pmtct” into an additional sheet as values and rename that sheet as Figure13, and follow the steps below:

1. Delete Columns C, D, E, and G, as these data are not used for this figure.
2. Sort data by % of estimated pregnant women tested for HIV (Column C) from largest to smallest.
3. Plot estimated number of pregnancies (in clustered columns and in secondary Y axis) and % of estimated pregnant women tested for HIV (in line graph, and on primary Y axis), as shown in Figure 13 (copied from Excel Sheet Figure13).

Figure 13. County-wise estimated number of pregnancies and percentage of pregnant women tested for HIV, 2021

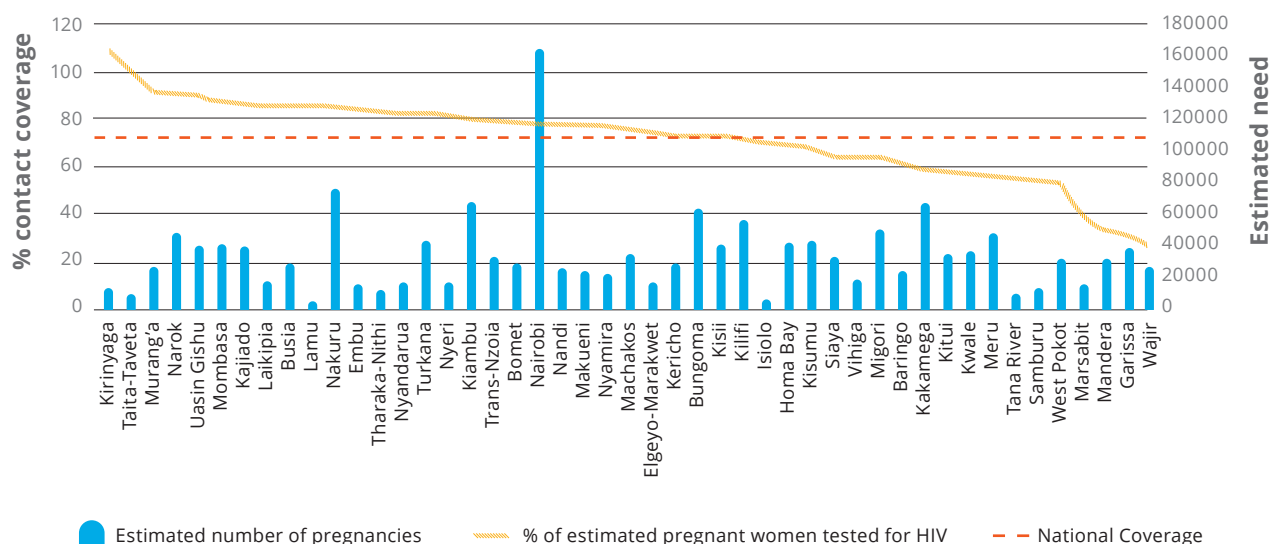


Figure 13 may be interpreted as follows:

1. Overall, an estimated 72% of the pregnant women in Kenya underwent HIV testing in 2021.
2. The estimated HIV testing rate among pregnant women fell below the national average in 19 counties.
3. In four counties (Marsabit, Mandera, Garissa, and Wajir), less than half of pregnant women underwent HIV testing at antenatal care.

Gaps in ART coverage among pregnant women (Figure 14)

Figure 14 is like Figure 13. It primarily uses data on the estimated PMTCT need (Column D) and the percentage of estimated HIV-positive pregnant women on ART (Column G) in Sheet “pmtct” in “Toolkit_County” Excel Workbook. For creating this figure, copy Sheet “pmtct” into an additional sheet as values, rename that sheet as Figure14, and follow the steps below:

1. Delete Columns B, C, E, and F, as these data are not used for this figure.
2. Sort data by % of estimated HIV-positive pregnant women on ART (Column C) from largest to smallest.
3. Plot estimated PMTCT need (in clustered columns and in secondary Y axis) and % of estimated HIV-positive pregnant women on ART (in line graph, and on primary Y axis), as shown in Figure 14 (copied from Excel Sheet Figure14).

Figure 14. County-wise estimated number of HIV-positive pregnant women and percentage of HIV-positive pregnant women on ART, 2021

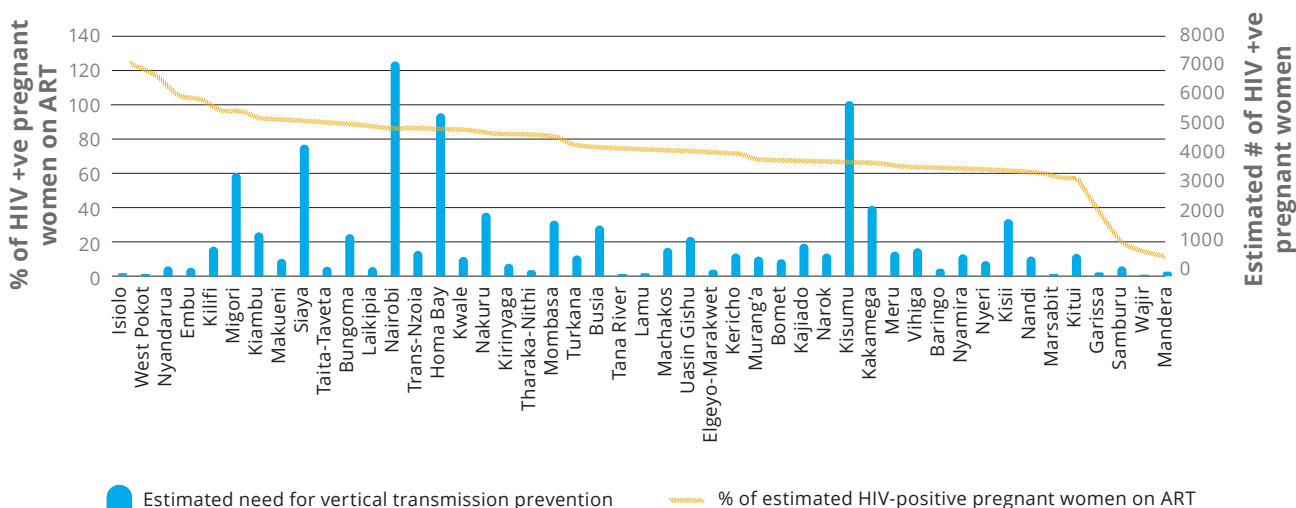


Figure 14 may be interpreted as follows:

1. More than 80% of the estimated women with PMTCT need were on ART in 19 (40% of the) counties.
2. Four counties—Garissa, Samburu, Wajir, and Mandera—had less than 50% of the estimated HIV-positive pregnant women on ART.

PMTCT Programme gaps at the sub-county level

An analysis of PMTCT Programme gaps at the sub-county level is presented in Sheet “pmtct” of the “Toolkit_Subcounty” Excel Workbook. Over-performance (more than 100% coverage) or under-performance on both testing and ART coverage at the sub-county level could be due to individuals having received such services in a sub-county in which they did not reside. If the HMIS data allowed an analysis of PMTCT coverage based on place of residence, it would probably reflect the true differences in coverage by sub-county.

The results for the four counties—Kisumu, Mombasa, Nairobi, and Nakuru—are presented below:

PMTCT Programme gaps in Kisumu County

Figure 15. Sub-county-wise estimated number of pregnancies and percentage of estimated pregnant women tested for HIV in Kisumu County

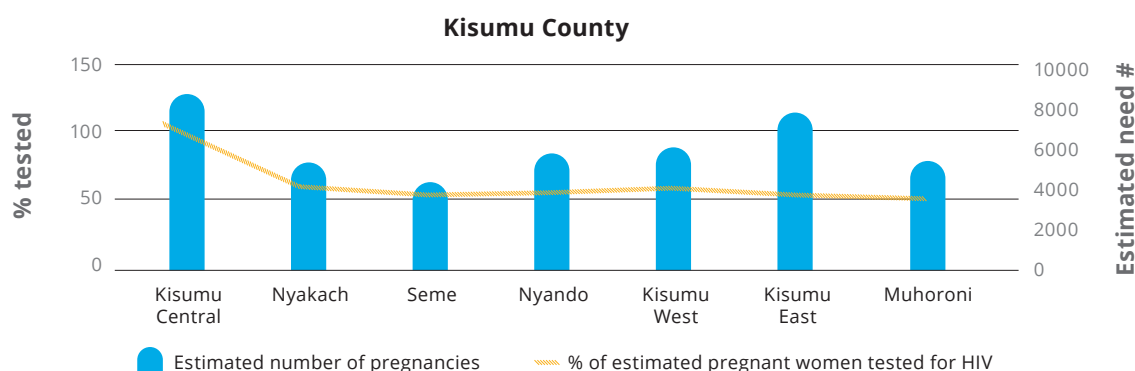
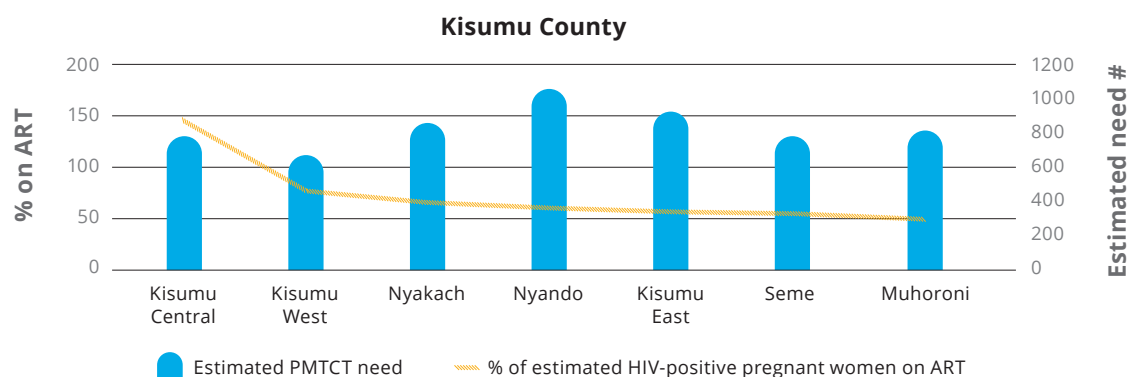


Figure 16. Sub-county-wise estimated PMTCT need and percentage of estimated HIV-positive pregnant women on ART in Kisumu County



PMTCT Programme gaps in Mombasa County

Figure 17. Sub-county-wise estimated number of pregnancies and percentage of estimated pregnant women tested for HIV in Mombasa County

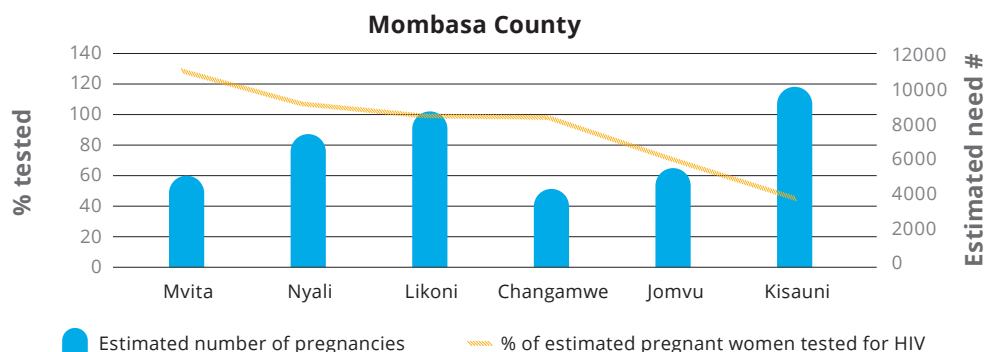
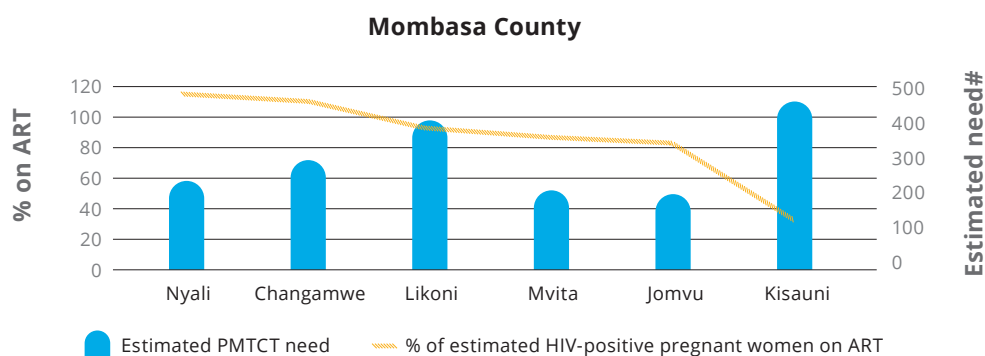


Figure 18. Sub-county-wise estimated PMTCT need and percentage of estimated HIV-positive pregnant women on ART in Mombasa County



PMTCT Programme gaps in Nairobi County

Figure 19. Sub-county-wise estimated number of pregnancies and percentage of estimated pregnant women tested for HIV in Nairobi County

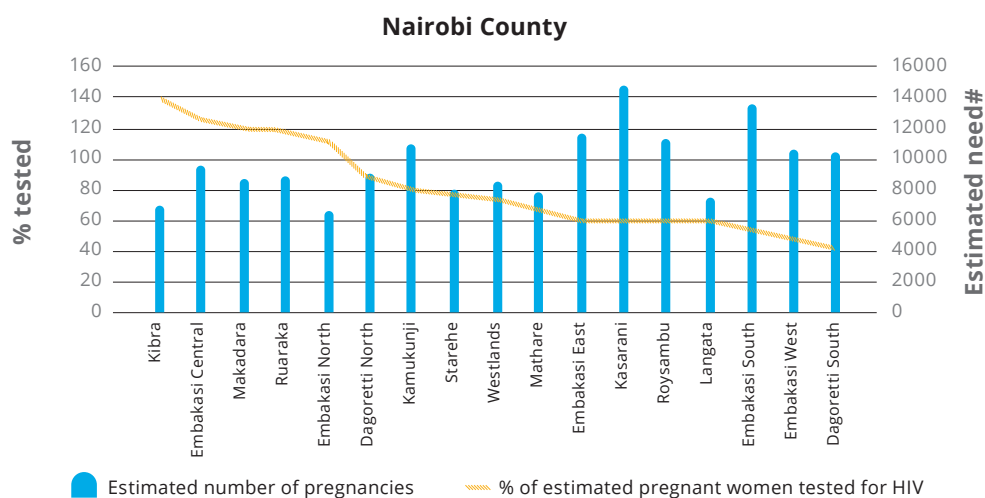
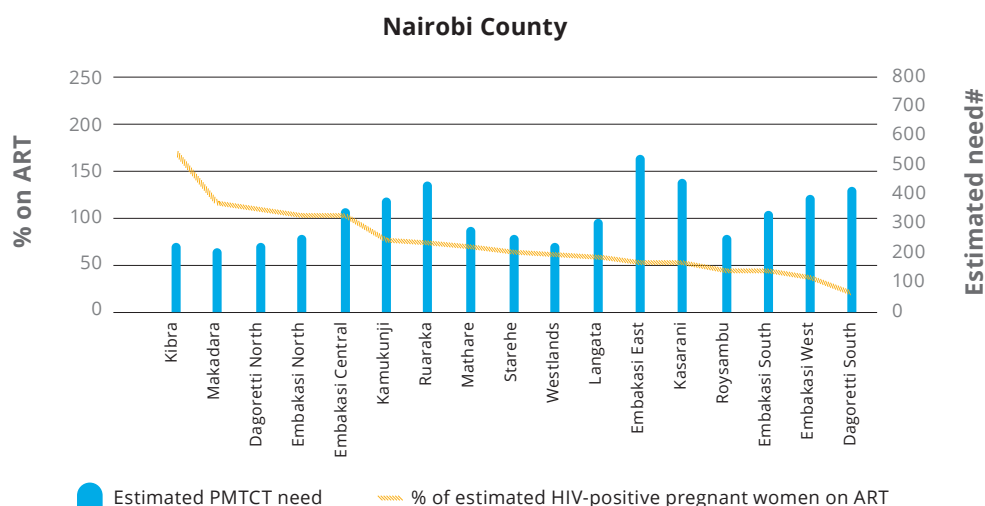


Figure 20. Sub-county-wise estimated PMTCT need and percentage of estimated HIV-positive pregnant women on ART in Nairobi County



PMTCT Programme gaps in Nakuru County

Figure 21. Sub-county-wise estimated pregnancies and percentage of estimated pregnant women tested for HIV in Nakuru County

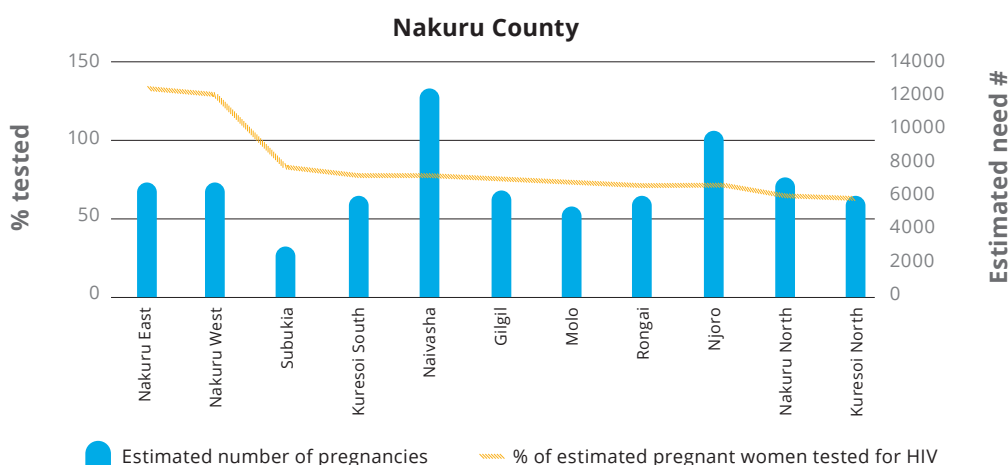
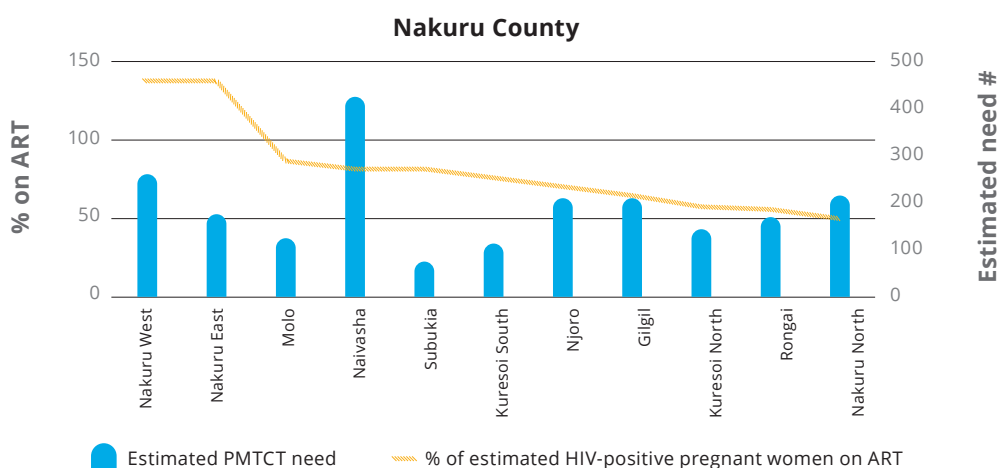


Figure 22. Sub-county-wise estimated PMTCT need and percentage of estimated HIV-positive pregnant women on ART in Nakuru County



For the Key Populations Programme, the contact coverage gap is the difference between the number of key population members who received at least one service in the last quarter and the estimated number of key population members (i.e., the proportion of key population members who received no service in the last quarter).

4.2.1 Data compilation/preparation

The county-wise data in Tables 15 and 16, also shown in Sheet “kp programs” of the “Toolkit_County” Excel Workbook, are compiled from specified sources:

1. The most recent estimates of female sex workers, men who have sex with men, and people who inject drugs. In this example, we have used the female sex worker, men who have sex with men, and people who inject drugs population estimates from 2020 (in Columns B, C, and D, respectively), simply copied from Columns F, G, and H, in from the Sheet “typology”).
2. The most recent data on the number of key population members contacted with any prevention service in the county. The October–December 2021 data on programme contact coverage for female sex workers, men who have sex with men, and people who inject drugs is shown in Columns E, F, and G. The values for counties that did not have contact for these key populations are entered as zero.

Table 15

Key population size estimates (2020) and key population members who received at least one prevention service (October–December 2021) by county

A County	B Key population size estimates, 2020			E KP members who received at least one service (October–December 2021, Active KP, MoH 731 plus, KHMIS)		
	F FSWs	G MSM	D PWID	F FSWs	G MSM	G PWID
Baringo	1970	568	339	1509	70	0
Bomet	2603	409	582	1476	242	76
Bungoma	3716	1353	413	1131	933	0
Busia	2421	550	281	2940	1712	30
Elgeyo-Marakwet	1268	186	291	1083	0	0
Embu	1851	427	75	1089	593	0
Garissa	2149	1285	299	0	0	0
Homa Bay	3823	983	55	4014	1110	6
Isiolo	688	346	817	0	0	0
Kajiado	7645	1759	436	7488	1387	115
Kakamega	3525	1378	329	4054	3272	0
Kericho	2333	605	180	2412	713	40
Kiambu	5809	2580	1045	6535	4634	592
Kilifi	6696	4589	3168	3518	3476	5643
Kirinyaga	2497	437	381	3435	1255	0
Kisii	6538	885	29	8234	2256	46
Kisumu	5277	4025	390	5323	5192	408
Kitui	2972	500	387	1762	865	0
Kwale	2833	1026	1127	2864	0	2712

A	B	C	D	E	F	G
County	Key population size estimates, 2020			KP members who received at least one service (October–December 2021, Active KP, MoH 731 plus, KHMIS)		
	FSWs	MSM	PWID	FSWs	MSM	PWID
Laikipia	1182	231	375	929	200	56
Lamu	749	211	450	0	0	0
Machakos	4932	2811	40	3726	1582	2
Makueni	2743	893	399	1747	327	0
Mandera	3952	1052	519	0	0	0
Marsabit	1530	476	392	0	0	0
Meru	2743	1026	60	2614	1660	3
Migori	5238	782	153	8476	2712	6
Mombasa	8187	3117	1992	5683	6736	2559
Murang'a	2532	904	412	2717	2927	211
Nairobi	39227	15271	4198	43167	16520	9722
Nakuru	17708	2706	9	16754	4947	16
Nandi	2957	514	661	2471	34	42
Narok	3107	704	403	1424	542	0
Nyamira	1999	193	654	1662	207	25
Nyandarua	1785	403	257	1200	439	0
Nyeri	1317	406	121	2783	1337	18
Samburu	1500	150	488	325	0	0
Siaya	3724	593	567	3334	1142	5
Taita-Taveta	1843	219	514	2711	801	82
Tana River	1798	212	524	620	0	32
Tharaka-Nithi	2594	219	568	4085	1609	0
Trans-Nzoia	3147	1114	180	3321	1063	27
Turkana	3722	515	609	3187	811	0
Uasin Gishu	2886	1693	676	3971	1597	0
Vihiga	1940	203	407	1771	270	64
Wajir	3139	860	187	0	0	0
West Pokot	2304	281	617	1762	0	33

4.2.2 Data analysis

The contact coverage is computed for each key population (as shown in Column H for female sex workers, I for men who have sex with men, and J for people who inject drugs) in Sheet “kp programs” of the “Toolkit_County” Excel Workbook:

1. In order to calculate the contact coverage for the country as a whole, insert the formula =sum(B3:B49) in cell B50, and copy the formula across the Columns C to G in the same row.
2. The contact coverage for female sex workers is computed in Column H, wherein the numerator is the number of female sex workers who received at least one service (Column E) and the denominator is the size estimate for the female sex workers (Column B). Use formula E3/B3% in cell H3 and copy the formula all the way down to cell H50. The same calculation is repeated in Column I for the men who have sex with men (formula F3/C3% in cell I3 and copy the formula all the way down to cell I50) and in Column J for the people who inject drugs (formula G3/D3% in cell J3 and copy the formula all the way down to cell J50).

Table 16

Key population size estimates (2020), key population members who received at least one prevention service (October–December 2021), and contact coverage of key populations by county

A County	B	C	D	E			F			G			H			I			J		
	Key population size estimates, 2020			KP members who received at least one service (October–December 2021, KHIS, MoH 731 plus KHMIS)						Contact coverage %											
	FSWs	MSM	PWID	FSWs	MSM	PWID	FSWs	MSM	PWID	FSWs	MSM	PWID	FSWs	MSM	PWID	FSWs	MSM	PWID			
Baringo	1970	568	339	1509	70	0	77	12	0												
Bomet	2603	409	582	1476	242	76	57	59	13												
Bungoma	3716	1353	413	1131	933	0	30	69	0												
Busia	2421	550	281	2940	1712	30	121	311	11												
Elgeyo-Marakwet	1268	186	291	1083	0	0	85	0	0												
Embu	1851	427	75	1089	593	0	59	139	0												
Garissa	2149	1285	299	0	0	0	0	0	0												
Homa Bay	3823	983	55	4014	1110	6	105	113	11												
Isiolo	688	346	817	0	0	0	0	0	0												
Kajiado	7645	1759	436	7488	1387	115	98	79	26												
Kakamega	3525	1378	329	4054	3272	0	115	237	0												
Kericho	2333	605	180	2412	713	40	103	118	22												
Kiambu	5809	2580	1045	6535	4634	592	112	180	57												
Kilifi	6696	4589	3168	3518	3476	5643	53	76	178												
Kirinyaga	2497	437	381	3435	1255	0	138	287	0												
Kisii	6538	885	29	8234	2256	46	126	255	159												
Kisumu	5277	4025	390	5323	5192	408	101	129	105												
Kitui	2972	500	387	1762	865	0	59	173	0												
Kwale	2833	1026	1127	2864	0	2712	101	0	241												
Laikipia	1182	231	375	929	200	56	79	86	15												
Lamu	749	211	450	0	0	0	0	0	0												
Machakos	4932	2811	40	3726	1582	2	76	56	5												
Makueni	2743	893	399	1747	327	0	64	37	0												
Mandera	3952	1052	519	0	0	0	0	0	0												
Marsabit	1530	476	392	0	0	0	0	0	0												
Meru	2743	1026	60	2614	1660	3	95	162	5												
Migori	5238	782	153	8476	2712	6	162	347	4												
Mombasa	8187	3117	1992	5683	6736	2559	69	216	128												
Murang'a	2532	904	412	2717	2927	211	107	324	51												
Nairobi	39227	15271	4198	43167	16520	9722	110	108	232												
Nakuru	17708	2706	9	16754	4947	16	95	183	178												
Nandi	2957	514	661	2471	34	42	84	7	6												
Narok	3107	704	403	1424	542	0	46	77	0												
Nyamira	1999	193	654	1662	207	25	83	107	4												
Nyandarua	1785	403	257	1200	439	0	67	109	0												
Nyeri	1317	406	121	2783	1337	18	211	329	15												
Samburu	1500	150	488	325	0	0	22	0	0												
Siaya	3724	593	567	3334	1142	5	90	193	1												

A	B	C	D	E	F	G	H	I	J
County	Key population size estimates, 2020			KP members who received at least one service (October–December 2021, KHIS, MoH 731 plus KHMIS)			Contact coverage %		
	FSWs	MSM	PWID	FSWs	MSM	PWID	FSWs	MSM	PWID
Taita-Taveta	1843	219	514	2711	801	82	147	366	16
Tana River	1798	212	524	620	0	32	34	0	6
Tharaka-Nithi	2594	219	568	4085	1609	0	158	736	0
Trans-Nzoia	3147	1114	180	3321	1063	27	106	95	15
Turkana	3722	515	609	3187	811	0	86	157	0
Uasin Gishu	2886	1693	676	3971	1597	0	138	94	0
Vihiga	1940	203	407	1771	270	64	91	133	16
Wajir	3139	860	187	0	0	0	0	0	0
West Pokot	2304	281	617	1762	0	33	76	0	5
TOTAL	197,096	61,650	27,056	179307	75173	22571	91	122	83

4.2.3 Data presentation and interpretation

Key Populations Programme coverage (Figure 23)

For Figure 23, the percentages for the whole country on Columns H–J on row 50 in Sheet “kp programs” are used. The figure is created in an additional Sheet renamed Figure23, using the following steps:

1. Create a table in Sheet 10 with three columns (FSWs in Column B, MSM in Column C, and PWID in Column D) and two rows in Column A: Estimate in cell A2, and Contact coverage in Cell A3.
2. For the estimate row, put in the value 100 for all three KP groups.
3. For the contact coverage row, insert the formula =‘kp programs’!H50 in cell B3, =‘kp programs’!I50 in cell C3, and =‘kp programs’!J50 in cell D3.
4. Create a Column or Bar chart using the table, as shown in Figure 21, restricting the y-axis to a maximum of 100.

Figure 23. Key Populations Programme contact coverage by key population

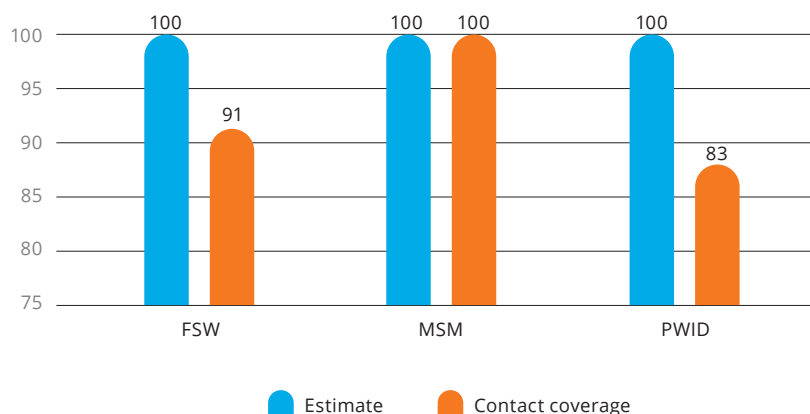


Figure 23 may be interpreted as follows:

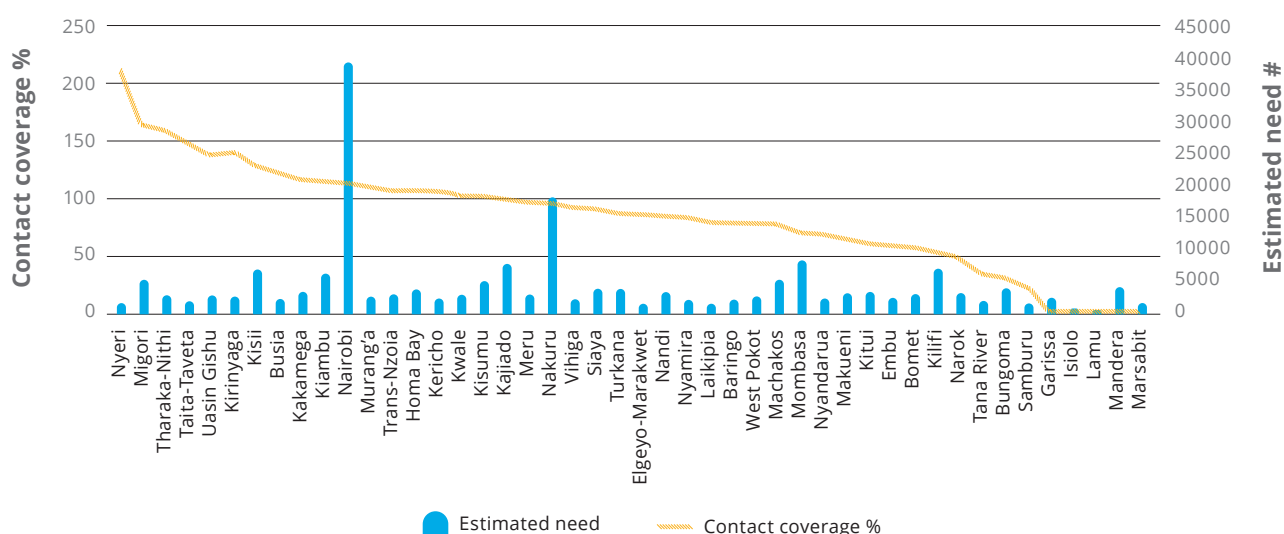
Overall, 100% of the estimated men who have sex with men have been contacted in 2021, and this proportion is 91% for the female sex workers and 83% for the people who inject drugs.

Key Populations Programme contact coverage among female sex workers (Figure 24)

Figure 24 primarily uses data in Sheet “kp programs” on the estimated FSW population (Column B) and the FSW contact coverage (Column E). For creating this figure, copy Sheet “kp programs” into an additional sheet as values and rename that sheet as Figure24, and follow the steps below:

1. Delete Columns C-G, I, and J, as well as Rows 2 and 50 as these data are not used for this figure. Rename Column B as “Estimated need”.
2. Sort data by % contact coverage (Column C) from largest to smallest
3. Plot estimated need (in clustered columns on Secondary Y axis) and % contact coverage (in line graph, and on Primary Y axis), as shown in Figure 22 (copied from Excel Sheet “Figure24”).

Figure 24. County-wise estimated need and contact coverage among female sex workers, Key Populations Programme

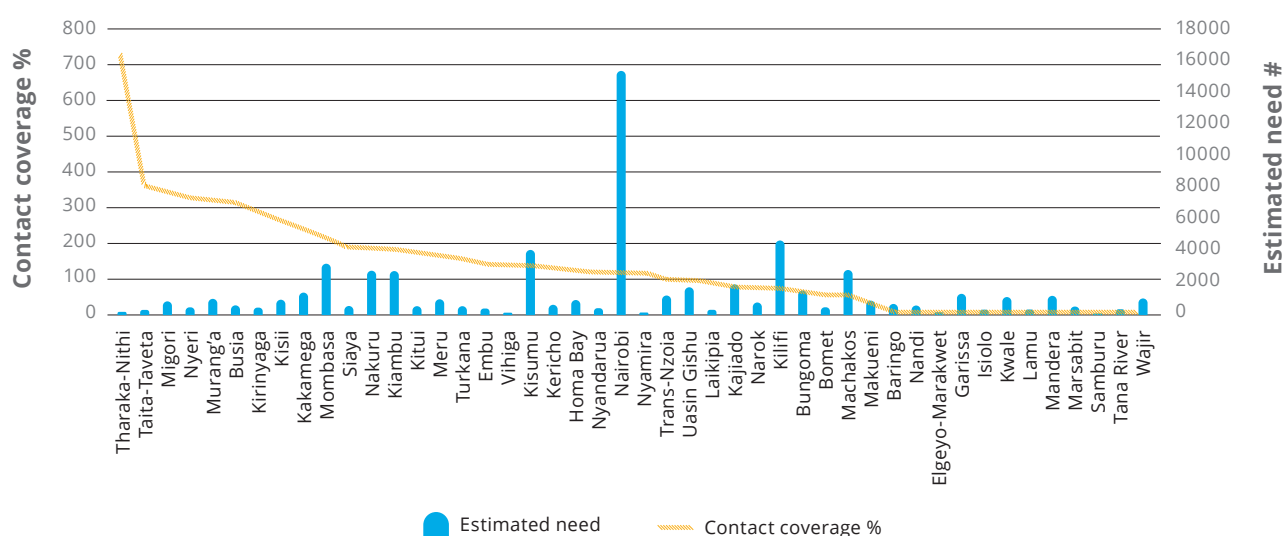


Key Populations Programme contact coverage among men who have sex with men (Figure 25)

Figure 25 is like Figure 24. It primarily uses data in Sheet “kp programs” on the estimated men who have sex with men population (Column C) and the contact coverage for men who have sex with men (Column F). For creating this figure, copy Sheet “kp programs” into an additional sheet as values and rename that sheet as Figure25, and follow the steps below:

4. Delete Columns B, D–H, and J, as well as Rows 2 and 50, as these data are not used for this figure. Rename Column B as “Estimated need”, Column C as “% Contact coverage”.
5. Sort data by % contact coverage (Column D) from largest to smallest.
6. Plot estimated need (in clustered columns in secondary Y axis) and % contact coverage (in line graph, and on primary Y axis), as shown in Figure 25 (copied from Excel Sheet “Figure25”).

Figure 25. County-wise estimated need and contact coverage among men who have sex with men, Key Populations Programme

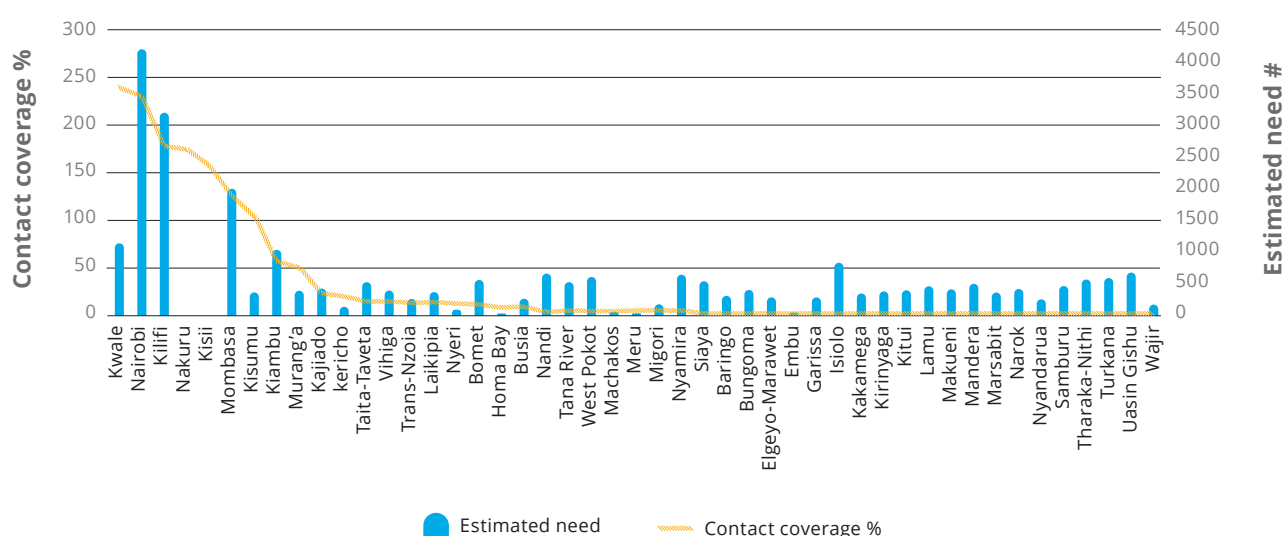


Key Populations Programme contact coverage among people who inject drugs (Figure 26)

Figure 26 is like Figure 25. It primarily uses data in Sheet “kp programs” on the estimated number of people who inject drugs (Column D) and the contact coverage for people who inject drugs (Column J). For creating this Figure, copy Sheet “kp programs” into an additional sheet as values, rename that sheet as Figure26, and follow the steps below:

1. Delete Columns B, C, and E-I as well as Rows 2 and 50, as these data are not used for this figure. Rename Column B as “Estimated need”, Column C as “% Contact coverage”.
2. Sort data by % contact coverage (Column C) from largest to smallest.
3. Plot estimated need (in clustered columns and in secondary Y axis) and % contact coverage (in line graph, and on primary Y axis), as shown in Figure 26 (copied from Excel Sheet “Figure26”).

Figure 26. County-wise estimated need and contact coverage among people who inject drugs, Key Populations Programme



Figures 24–26 together may be interpreted as follows:

1. Despite high coverage of key populations in Kenya, programme coverage varies across counties.
2. Most of the 24 counties with concentrated epidemics in Table 9 do not have interventions for key populations.

Key Populations Programme gaps at the sub-county-level

The Key Populations Programme gaps at the sub-county-level are provided in the Sheet “KP programs” in the “Toolkit_Subcounty” Excel Workbook. The key population estimates of 2020 at the county level are equally distributed over the sub-counties. Hence, the key population size estimates are assumed to be the same across sub-counties. To that extent, the programme achievements/gaps currently measured at the sub-county level are not accurate. **It is hoped that during the regional epidemic appraisal workshops, the key population estimates for the sub-counties are used as denominators, wherever available.** Due to these data limitations, the Key Populations Programme gaps at the sub-county level are not presented in the Toolkit. See Annexure 1 for a county epidemic appraisal example.

4.3 ADOLESCENTS AND YOUNG PEOPLE PROGRAMME

For the Adolescents and Young People Programme, contact coverage is measured as the percentage of the estimated number of adolescent girls and young women / adolescent boys and young men (AGYW/ABYM) in need for HIV prevention (defined in the UNAIDS KPSE, 2021, as adolescent girls and young women (15-24 years) who have non regular sexual partners and/or sell sex, and adolescent boys and young men (15-24 years) who have non regular sexual partners and/or have sex with other boys and men and/or inject drugs and/or are uncircumcised) who received at least one service (i.e., HIV testing, as per HMIS MoH 731) in 2021. One can use the regular contact data, wherever available, instead of HIV testing data, which was the only data available in Kenya. This analysis is done for all counties, although Kenya has prioritised 14 counties for the Adolescents and Young People Programme.

4.3.1 Data compilation/preparation

The county-wise data in Tables 17 and 18, also shown in Sheet “agyw-abym” of the “Toolkit_County” Excel Workbook, are compiled from specified sources:

1. The most recent UNAIDS estimates of the number of adolescent girls and young women in need for each county are used in Column B.
2. The most recent county-wise number of adolescent girls and young women reached by one service. In this example, the KHIS report on the number of adolescent girls and young women tested for HIV for the last quarter in 2021 is used in Column C.
3. The most recent UNAIDS estimates of the number of adolescent boys and young men in need for each county is used in Column D.
4. The most recent county-wise number of adolescent boys and young men reached by one service. In this example, the KHIS report on the number of adolescent boys and young men tested for HIV for the last quarter in 2021 is used in Column E.

Table 17

AGYW and ABYM in need of HIV prevention and AGYW/ABYM tested for HIV by county				
A	B	C	D	E
County	AGYW population in need (based on UNAIDS KPSE, 15-24, 2022)	AGYW contacted (HIV testing, 15-24 years, MoH 731, 2021)	ABYM population in need (based on UNAIDS KPSE, 15-24, 2022)	ABYM contacted (HIV testing, 15-24 years, MoH 731, 2021)
Baringo	38343	7814	30632	2643
Bomet	52038	14931	41090	6126
Bungoma	94831	7875	57061	5094
Busia	55492	4939	35369	3083
Elgeyo-Marakwet	25530	2205	26962	1393

A County	B AGYW population in need (based on UNAIDS KPSE, 15–24, 2022)	C AGYW contacted (HIV testing, 15–24 years, MoH 731, 2021)	D ABYM population in need (based on UNAIDS KPSE, 15–24, 2022)	E ABYM contacted (HIV testing, 15–24 years, MoH 731, 2021)
Embu	30234	11608	23663	2305
Garissa	49452	4517	11007	2915
Homa Bay	78421	36960	60766	18321
Isiolo	13086	1141	9234	527
Kajiado	63415	10116	46935	5580
Kakamega	107045	5996	73792	4055
Kericho	55745	14761	40918	3263
Kiambu	126963	34482	96230	16474
Kilifi	85223	37777	56072	10747
Kirinyaga	23618	17123	18763	4446
Kisii	75517	28419	60643	9876
Kisumu	81013	31779	56806	20637
Kitui	59128	11282	41190	4504
Kwale	46834	16232	33396	3926
Laikipia	25922	10238	16165	3237
Lamu	6601	2513	3920	1529
Machakos	77541	15495	51611	7646
Makueni	51155	15855	31183	5466
Mandera	35652	3519	5376	1293
Marsabit	25560	1307	21690	850
Meru	80130	24020	61080	7798
Migori	85758	47968	54450	15206
Mombasa	71159	46297	53111	10713
Murang'a	40345	13679	31621	8019
Nairobi	236650	140004	155804	51454
Nakuru	125262	57107	102378	27347
Nandi	51598	13241	41198	4667
Narok	70463	30212	44985	11079
Nyamira	28314	12547	27440	4034
Nyandarua	24012	11468	19260	3440
Nyeri	23316	8848	17804	6160
Samburu	19622	5592	15678	1848
Siaya	58223	28203	48596	9643
Taita-Taveta	13638	9507	12912	3030
Tana River	17781	5120	10318	1756
Tharaka-Nithi	19173	6046	13170	3058
Trans-Nzoia	57094	4031	43982	2569
Turkana	39718	32036	40406	17755
Uasin Gishu	82009	11527	63520	6502
Vihiga	29243	9473	21002	2793
Wajir	30478	1728	8861	1274
West Pokot	36258	10595	29139	1932

4.3.2 Data analysis

The contact coverage is computed for each key population (as shown in Column H for female sex workers, I for men who have sex with men, and J for people who inject drugs) in Sheet “kp programs” of the “Toolkit_County” Excel Workbook:

1. In order to calculate the contact coverage for the country as a whole, insert the formula =sum(B2:B48) in cell B49, and copy the formula across the Columns C, D, and E in the same row.
2. The Adolescents and Young People Programme’s contact coverage for adolescent girls and young women is computed in Column F wherein the numerator is the number of adolescent girls and young women who were tested for HIV (Column C) and the denominator is the adolescent girls and young women population in need (Column B). Use formula C2/B2% in cell F2 and copy the formula all the way down to cell F49.
3. Similarly, the Adolescents and Young People Programme’s contact coverage for adolescent boys and young men is computed in Column G wherein the numerator is the number of adolescent boys and young men who were tested for HIV (Column E) and the denominator is the adolescent boys and young men population in need (Column D). Use formula E2/D2% in cell G2 and copy the formula all the way down to cell G49.

Table 18

AGYW/ABYM in need of HIV prevention, AGYW/ABYM tested for HIV, and contact coverage by county

A	B	C	D	E	F	G
County	AGYW population in need (based on UNAIDS KPSE, 15-24, 2021)	AGYW contacted (HIV testing, 15-24 years, MoH 731, 2021)	ABYM population in need (based on UNAIDS KPSE, 15-24, 2021)	ABYM contacted (HIV testing, 15-24 years, MoH 731, 2021)	% contact coverage AGYW	% contact coverage ABYM
Baringo	38343	7814	30632	2643	20	9
Bomet	52038	14931	41090	6126	29	15
Bungoma	94831	7875	57061	5094	8	9
Busia	55492	4939	35369	3083	9	9
Elgeyo-Marakwet	25530	2205	26962	1393	9	5
Embu	30234	11608	23663	2305	38	10
Garissa	49452	4517	11007	2915	9	26
Homa Bay	78421	36960	60766	18321	47	30
Isiolo	13086	1141	9234	527	9	6
Kajiado	63415	10116	46935	5580	16	12
Kakamega	107045	5996	73792	4055	6	5
Kericho	55745	14761	40918	3263	26	8
Kiambu	126963	34482	96230	16474	27	17
Kilifi	85223	37777	56072	10747	44	19
Kirinyaga	23618	17123	18763	4446	73	24
Kisii	75517	28419	60643	9876	38	16
Kisumu	81013	31779	56806	20637	39	36
Kitui	59128	11282	41190	4504	19	11
Kwale	46834	16232	33396	3926	35	12
Laikipia	25922	10238	16165	3237	39	20
Lamu	6601	2513	3920	1529	38	39
Machakos	77541	15495	51611	7646	20	15
Makueni	51155	15855	31183	5466	31	18

A	B	C	D	E	F	G
County	AGYW population in need (based on UNAIDS KPSE, 15–24, 2022)	AGYW contacted (HIV testing, 15–24 years, MoH 731, 2021)	ABYM population in need (based on UNAIDS KPSE, 15–24, 2022)	ABYM contacted (HIV testing, 15–24 years, MoH 731, 2021)	% contact coverage AGYW	% contact coverage ABYM
Mandera	35652	3519	5376	1293	10	24
Marsabit	25560	1307	21690	850	5	4
Meru	80130	24020	61080	7798	30	13
Migori	85758	47968	54450	15206	56	28
Mombasa	71159	46297	53111	10713	65	20
Murang'a	40345	13679	31621	8019	34	25
Nairobi	236650	140004	155804	51454	59	33
Nakuru	125262	57107	102378	27347	46	27
Nandi	51598	13241	41198	4667	26	11
Narok	70463	30212	44985	11079	43	25
Nyamira	28314	12547	27440	4034	44	15
Nyandarua	24012	11468	19260	3440	48	18
Nyeri	23316	8848	17804	6160	38	35
Samburu	19622	5592	15678	1848	28	12
Siaya	58223	28203	48596	9643	48	20
Taita-Taveta	13638	9507	12912	3030	70	23
Tana River	17781	5120	10318	1756	29	17
Tharaka-Nithi	19173	6046	13170	3058	32	23
Trans-Nzoia	57094	4031	43982	2569	7	6
Turkana	39718	32036	40406	17755	81	44
Uasin Gishu	82009	11527	63520	6502	14	10
Vihiga	29243	9473	21002	2793	32	13
Wajir	30478	1728	8861	1274	6	14
West Pokot	36258	10595	29139	1932	29	7
TOTAL	2624605	878133	1867185	839873	33	45

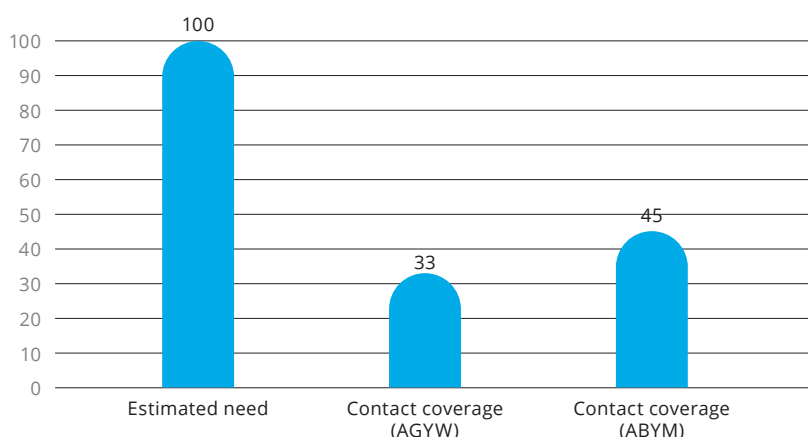
4.3.3 Data presentation and interpretation

The national Adolescents and Young People Programme coverage (Figure 27)

For Figure 27, the percentages for the whole country in Columns F and G in row 49 of Sheet “agyw-abym” of the “Toolkit_County” Excel Workbook are used. The figure is created in an additional sheet renamed Figure27, using the following steps:

1. Create a table in Sheet Figure27 in three rows in Column A: Estimated need, Contact coverage (AGYW) and Contact coverage (ABYM).
2. For the estimated need row, put in the value 100 in Column B.
3. For the contact coverage (AGYW) row, insert the formula =‘agyw-abym’!F49 in Column B.
4. For the contact coverage (ABYM) row, insert the formula =‘agyw-abym’!G49 in Column B.
5. Create a Column or Bar chart using the table, as shown in Figure 25, restricting the y-axis to a maximum of 100.

Figure 27. Estimated need and AGYW/ABYM Programme coverage (%)

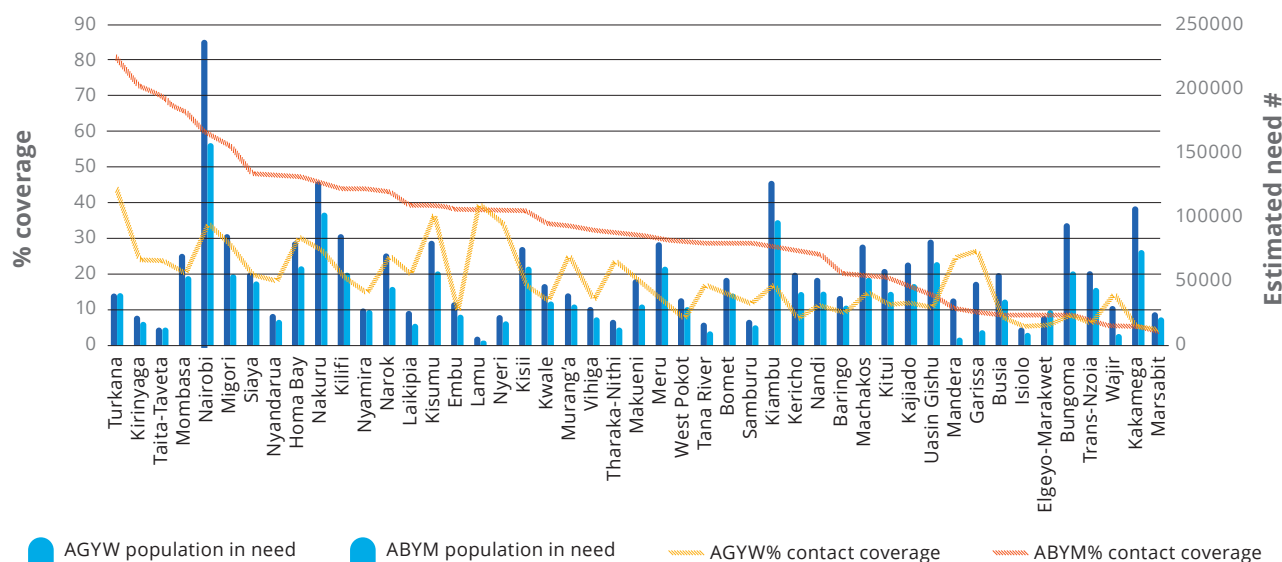


County-wise Adolescents and Young People Programme coverage (Figure 28)

Figure 28 is like Figure 26. It primarily uses data in Sheet “agyw-abym” in the “Toolkit_County” Excel Workbook on the estimated need separately for AGYW and ABYM (Columns B and D), and contact coverage percentages separately for AGYW and ABYM (Columns F and G). For creating this figure, copy Sheet “agyw-abym” into a new sheet as values and rename that sheet as Figure28, and follow the steps below:

1. Delete Columns C and E as well as Row 49, as these data are not used for this figure.
2. Sort data by % contact coverage - AGYW (Column B) from largest to smallest.
3. Plot estimated needs (in clustered columns and in secondary Y axis) and % contact coverages (in line graph, and on primary Y axis), as shown in Figure 28 (copied from Excel Sheet Figure28).

Figure 28. County-wise AGYW/ABYM need for HIV prevention and AGYW/ABYM Programme contact coverage



Figures 27 and 28 together may be interpreted as follows:

1. Only 33% and 45% of the estimated adolescent girls and young women and adolescent boys and young men who need HIV prevention, respectively, are being covered in Kenya.
2. The contact coverage for adolescent girls and young women ranges from 5% in Marsabit (with an estimated need of ~25,000) to 80% in Turkana (with an estimated need of ~40,000).
3. The contact coverage for adolescent boys and young men ranges from 4% in Marsabit (with an estimated need of ~22,000) to 44% in Turkana (with an estimated need of ~40,000).

Adolescents and Young People Programme gaps at the sub-county level

The Adolescents and Young People Programme gaps at the sub-county level are analysed in the Sheet “agyw-abym” in the “Toolkit_Subcounty” Excel Workbook. Examples of the results for four counties— Kisumu, Mombasa, Nairobi, and Nakuru—are presented in Figures 29–32.

Figure 29. Sub-county-wise estimated AGYW and ABYM in need of HIV prevention and contact coverage, Kisumu County

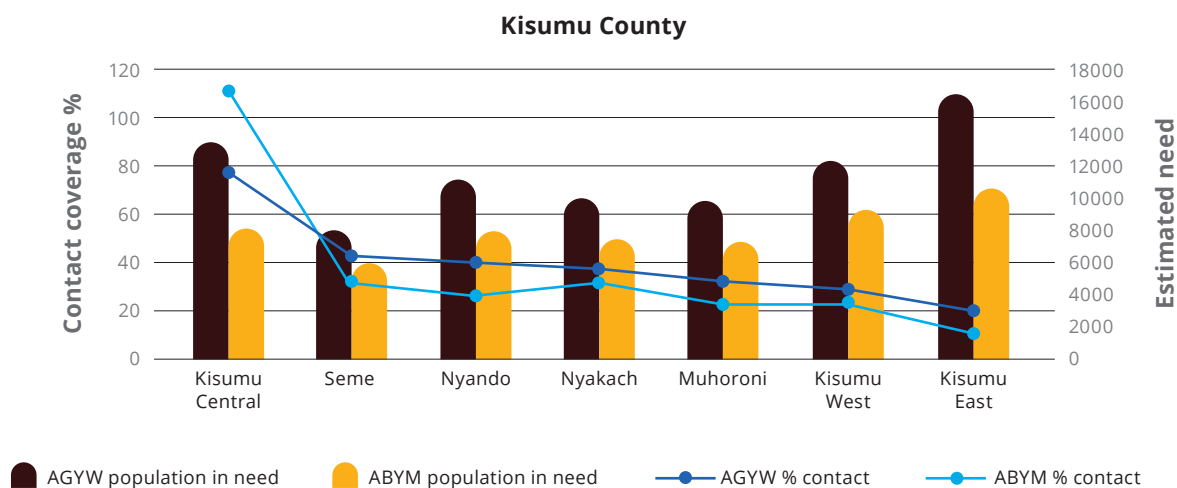


Figure 30. Sub-county-wise estimated AGYW and ABYM in need of HIV prevention and contact coverage, Mombasa County

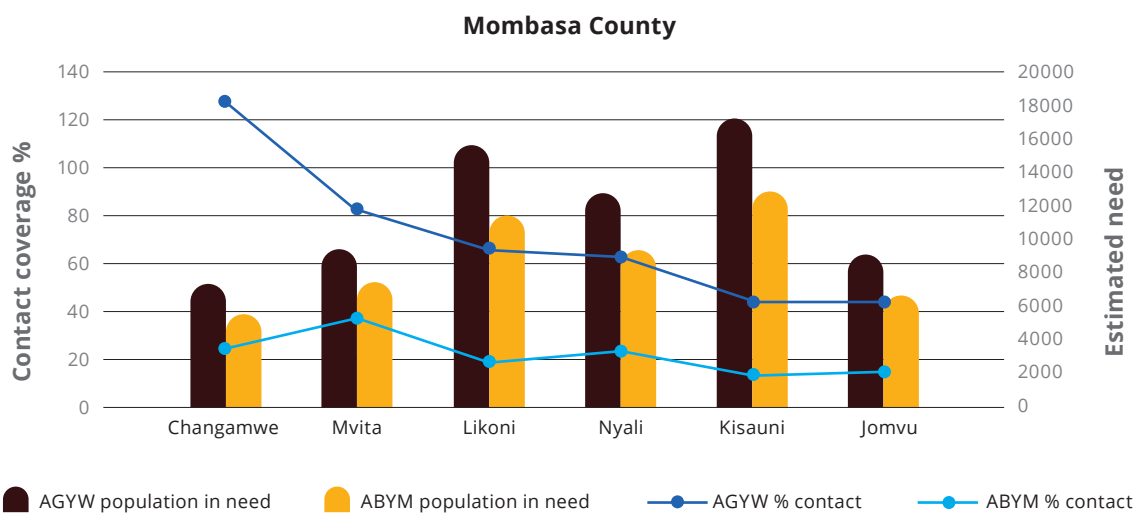


Figure 31. Sub-county-wise estimated AGYW and ABYM in need of HIV prevention and contact coverage, Nairobi County

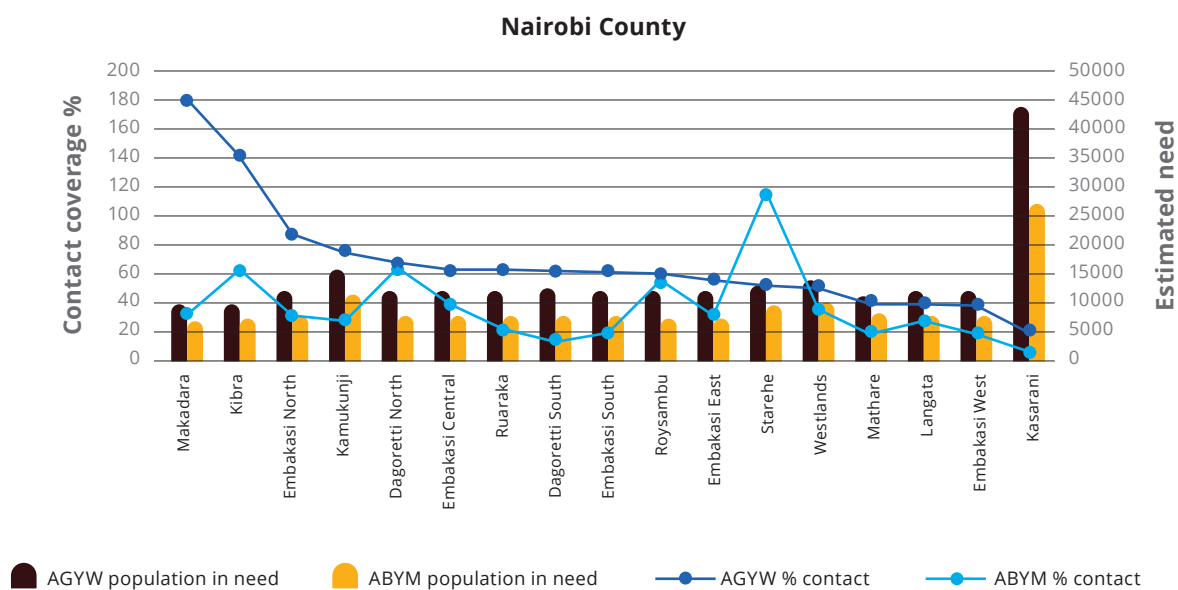
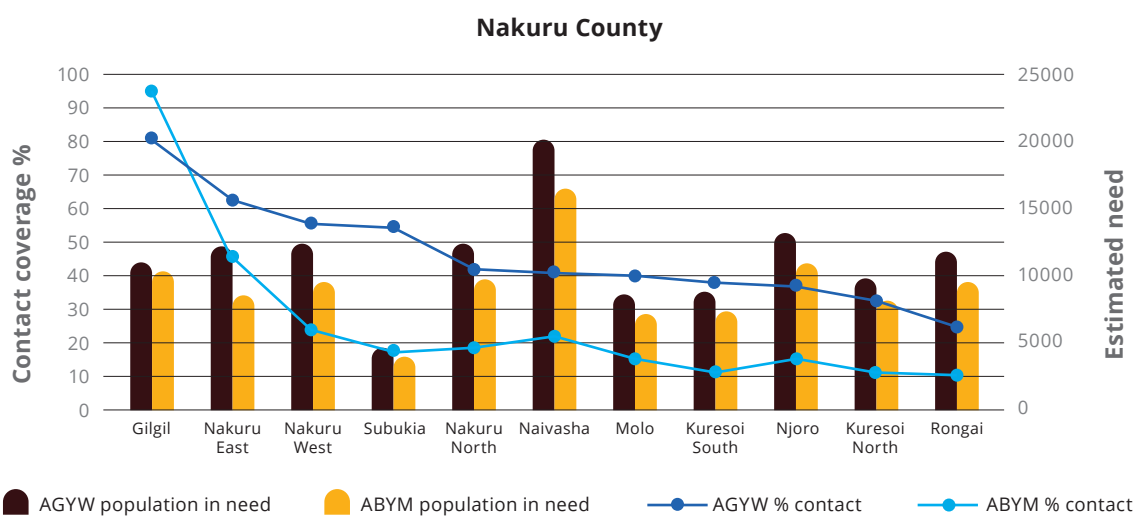


Figure 32. Sub-county-wise estimated AGYW and ABYM in need of HIV prevention and contact coverage, Nakuru County



This analysis of the VMMC Programme measures the contact coverage in terms of boys and men reached with VMMC services (i.e., the percentage of men and boys who underwent circumcision in the year). Since only 12 counties—Busia, Homa Bay, Kericho, Kisumu, Migori, Mombasa, Nairobi, Nakuru, Nandi, Siaya, Turkana, and West Pokot—are traditionally non-circumcising counties, the VMMC Programme gap analysis is restricted to these 12 counties.

4.4.1 Data compilation/preparation

The county-wise data in Tables 19 and 20, also shown in Sheet “vmmc” of the “Toolkit_County” Excel Workbook, are compiled from specified sources:

1. The most recent county-wise estimates of uncircumcised men age 15+, only for the 12 traditionally non-circumcising counties. In this example, the estimated number of uncircumcised boys and men in the county, as per the KENPHIA 2018 report, is used as the denominator or estimated need (Column B).
2. The most recent county-wise number of boys and men who underwent circumcision in a year. Here, the January to December 2021 data from the KHIS is used in Column C.

Table 19

Estimated uncircumcised men (aged 15 and above) and VMMC conducted by counties that had a VMMC target

A	B	C
County	Estimated uncircumcised men (aged 15+)	VMMC conducted
Busia	46,082	20693
Homa Bay	123,538	58497
Kericho	11,275	11861
Kisumu	166,816	88016
Migori	99,793	34310
Mombasa	18,999	5304
Nairobi	99,217	32699
Nakuru	53,254	3942
Nandi	26,680	23365
Siaya	106,930	51234
Turkana	123,172	62973
West Pokot	17,301	3507

4.4.2 Data analysis

1. In order to calculate the contact coverage for the country as a whole, insert the formula =sum(B2:B13) in cell B14, and copy the formula across Column C in the same row.
2. The contact coverage for the VMMC Programme is computed in Column D wherein the numerator is the number of VMMCs conducted (Column C) and the denominator is the population in need (i.e., the estimated number of uncircumcised boys and men) (Column B). Use formula C2/B2% in cell D2 and copy the formula all the way down to cell D14.

Table 20

Estimated uncircumcised men (aged 15 and above), VMMC conducted, and VMMC Programme contact coverage by counties that had a VMMC target

A	B	C	D
County	Estimated uncircumcised men (aged 15+)	VMMC conducted (MOH 731 DHIS 2021)	Contact coverage %
Busia	46,082	20693	45
Homa Bay	123,538	58497	47
Kericho	11,275	11861	105
Kisumu	166,816	88016	53
Migori	99,793	34310	34
Mombasa	18,999	5304	28
Nairobi	99,217	32699	33
Nakuru	53,254	3942	7
Nandi	26,680	23365	88
Siaya	106,930	51234	48
Turkana	123,172	62973	51
West Pokot	17,301	3507	20
	893,057	396,401	44

4.4.3 Data presentation and interpretation

County-wise VMMC Programme contact coverage, among counties that had a VMMC target (Figure 33)

Figure 33 primarily uses data on the estimated need (Column B) and % coverage (Column C) in Sheet “vmmc” of “Toolkit_County” Excel Workbook. For creating this figure, copy Sheet “vmmc” into a new sheet as values and rename that sheet as

Figure33, and follow the steps below:

1. Delete Column C as well as Row 49 as these data are not used for this figure. Rename Column B as “Estimated need”, Column C as “% Contact coverage”.
2. Keep only the rows with the following county names, as only these counties have the VMMC programme targets: Busia, Homa Bay, Kericho, Kisumu, Migori, Mombasa, Nairobi, Nakuru, Nandi, Siaya, Turkana, and West Pokot.
3. Sort data by % contact coverage (Column C) from largest to smallest.
4. Plot estimated need (in clustered columns and in secondary Y axis) and % contact coverage (in line graph, and on primary Y axis), as shown in Figure 33 (copied from Excel Sheet Figure33).
5. Create a Column or Bar chart using the table, as shown in Figure 25.

Figure 33. County-wise estimated VMMC need and VMMC Programme coverage among counties with a VMMC target

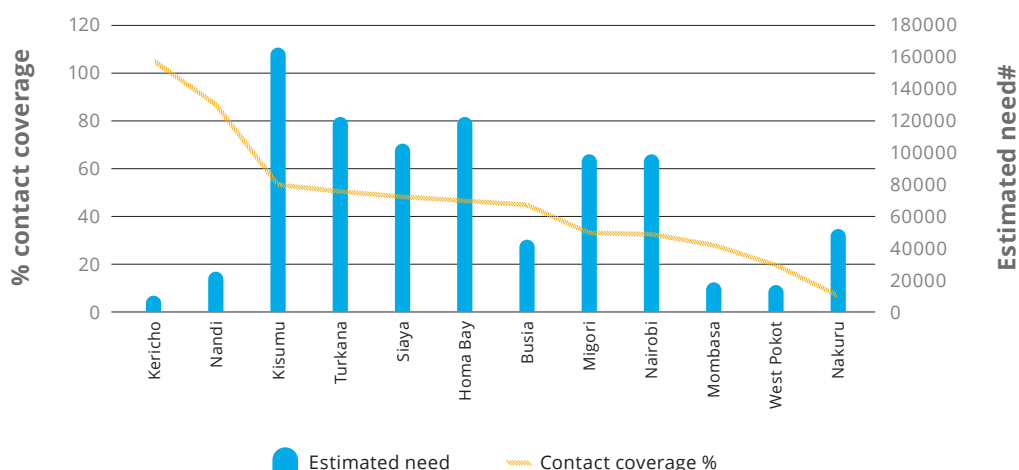


Table 20 and Figure 33 may be interpreted as follows:

1. The VMMC Programme focuses on 12 priority counties:
 - a. Five culturally non-circumcising counties: Turkana, Kisumu, Migori, Siaya, and Homa Bay
 - b. Seven culturally circumcising counties with non-circumcising subgroups: Mombasa, Nairobi, Busia, West Pokot, Nandi, Nakuru, and Kericho
2. Some 44% of the estimated 893,057 uncircumcised men in these counties underwent VMMC.
3. The VMMC Programme coverage was less than 60% in the six counties with at least 100,000 estimated in need.

VMMC Programme contact coverage at the sub-county level

The VMMC Programme gaps at the sub-county level are analysed in Sheet “vmmc” of the “Toolkit_Subcounty” Excel Workbook. Examples of the results for four counties—Kisumu, Mombasa, Nairobi, and Nakuru—are presented in Figures 34–37.

Figure 34. Sub-county-wise estimated VMMC need and VMMC Programme contact coverage, Kisumu County

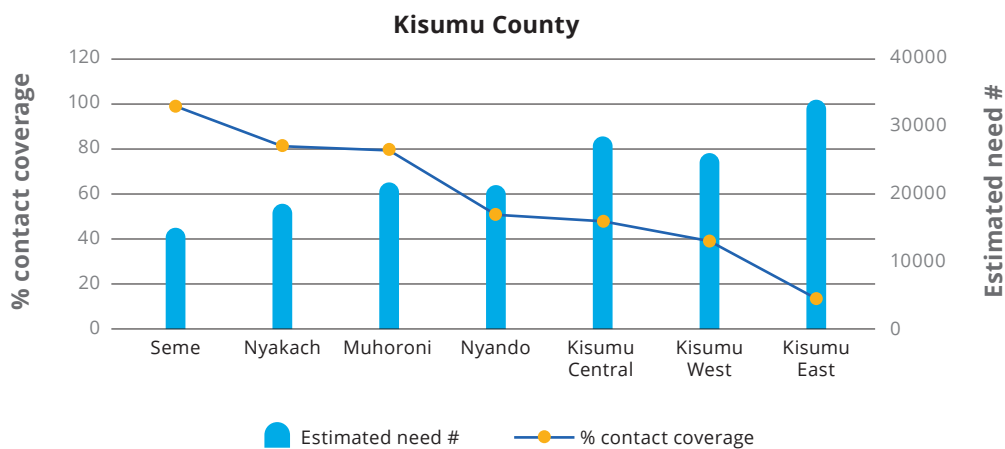


Figure 35. Sub-county-wise estimated VMMC need and VMMC Programme contact coverage, Mombasa County

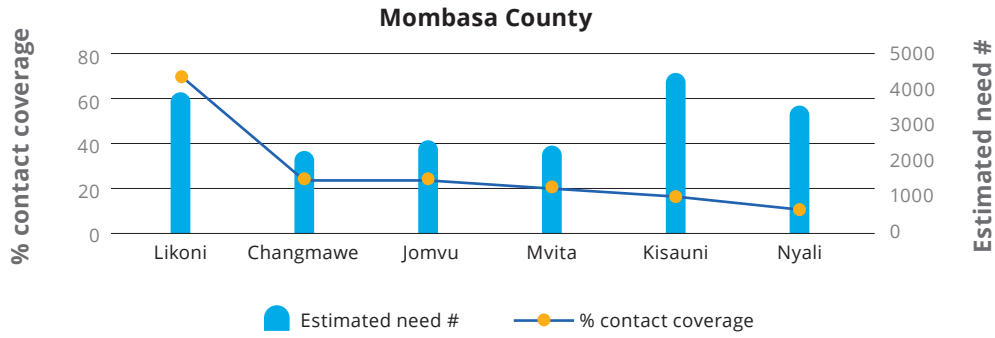


Figure 36. Sub-county-wise estimated VMMC need and VMMC Programme contact coverage, Nairobi County

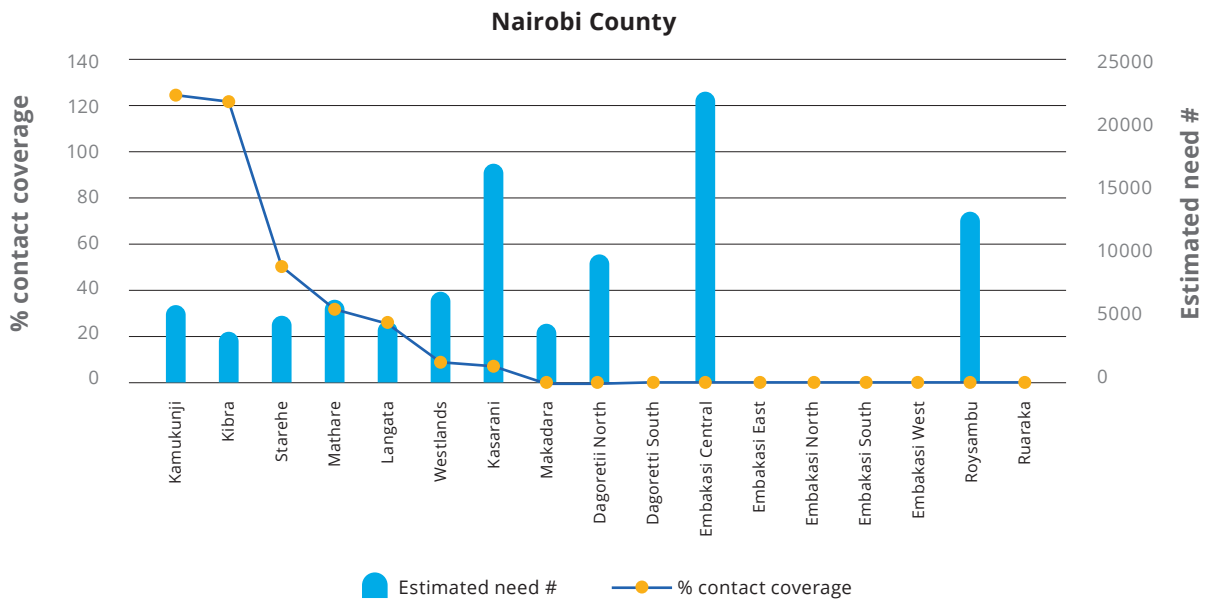
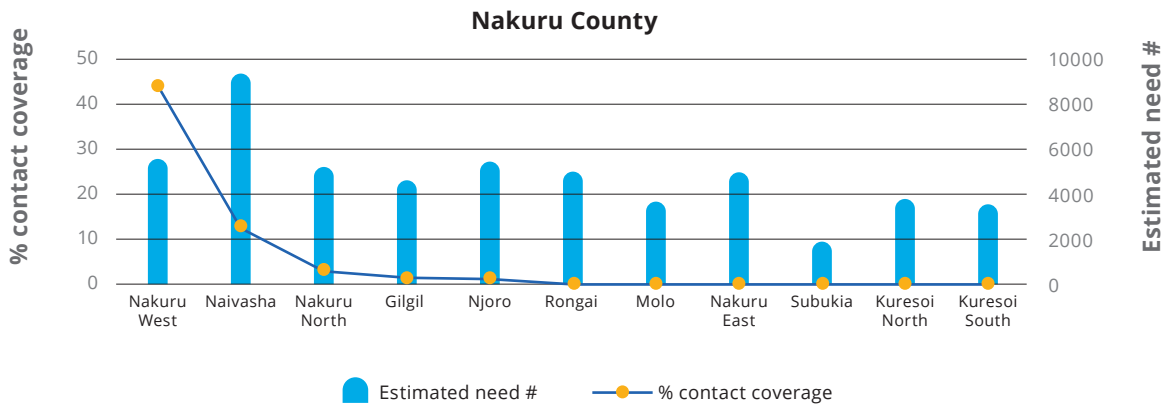


Figure 37. Sub-county-wise estimated VMMC need and VMMC Programme contact coverage, Nakuru County



4.5 Antiretroviral Therapy Programme

This analysis of the ART Programme measures progress towards the 95-95-95 targets by using the cascade data presentation described by UNAIDS.¹⁵

HIV cascade indicator 1	HIV cascade indicator 2	HIV cascade indicator 3
At least 95% of people living with HIV know their HIV status. (Same as first 95)	At least 90% of people living with HIV are on treatment.	At least 86% of people living with HIV have a suppressed viral load.

4.5.1 Data compilation/preparation

The county-wise data in Tables 21 and 22, also shown in Sheet “ART” of the “Toolkit_County” Excel Workbook, are compiled from specified sources:

1. The most recent county-wise estimates of people living with HIV. In this example, the estimated number of people living with HIV from the DHIS for the period January to December 2021 is used as the denominator for the HIV testing and treatment cascade indicators (Column B).
2. The most recent county-wise estimates of people living with HIV who know their HIV status. Here, the January to December 2021 data from the DHIS is used in Column C.
3. The most recent county-wise data on the number of people living with HIV who are on ART. Here the January to December 2021 data from the DHIS is used in Column D.
4. The most recent county-wise data on the people living with HIV who are virally suppressed. Here, the January to December 2021 data from the DHIS is used in Column E.

¹⁵ Joint United Nations Programme on HIV/AIDS. 2024. Understanding measures of progress towards the 95-95-95 HIV testing, treatment and viral suppression targets. No place: UNAIDS. https://www.unaids.org/sites/default/files/media_asset/progress-towards-95-95-95_en.pdf

Table 21

Estimated PLHIV, PLHIV who know their HIV status, PLHIV on ART, and PLHIV who are virally suppressed by county, 2021

A	B	C	D	E
County	Estimated PLHIV	PLHIV who know their HIV status	PLHIV on ART	PLHIV who are virally suppressed
Baringo	7777	6127	5614	3646
Bomet	15372	9031	9025	9352
Bungoma	30594	28449	28442	9420
Busia	36813	35463	35457	16775
Elgeyo-Marakwet	6722	4301	4299	6520
Embu	11017	10313	10312	8983
Garissa	1391	1394	1393	132
Homa Bay	122954	125221	125195	38256
Isiolo	3347	829	816	420
Kajiado	30255	16783	16758	9989
Kakamega	50991	44743	44722	25743
Kericho	22182	15333	15328	13006
Kiambu	46571	41349	41325	39341
Kilifi	29962	21602	21586	16868
Kirinyaga	13502	11847	11845	11020
Kisii	42842	37219	37204	25972
Kisumu	130036	111818	111787	72050
Kitui	27919	22269	22258	15580
Kwale	19140	10906	10892	7109
Laikipia	9130	9925	9921	6949
Lamu	2568	1704	1704	512
Machakos	34889	30432	30364	17567
Makueni	21644	23785	23770	16327
Mandera	2190	800	800	56
Marsabit	2717	1144	1123	8
Meru	31186	21942	21930	18655
Migori	77690	75673	75666	38659
Mombasa	54303	48835	48807	36128
Murang'a	21550	17126	17110	10666
Nairobi	153818	163379	163289	113047
Nakuru	58678	45990	45979	27034
Nandi	18681	12318	12310	9346
Narok	21848	10377	10373	7969
Nyamira	16691	15663	15659	8040
Nyandarua	10570	10448	10443	8088
Nyeri	16522	19031	19024	18472
Samburu	9307	1944	1941	1538
Siaya	97922	98016	98007	72464

A County	B Estimated PLHIV	C PLHIV who know their HIV status	D PLHIV on ART	E PLHIV who are virally suppressed
Taita-Taveta	9952	7175	7169	4872
Tana River	2259	1370	1369	522
Tharaka-Nithi	7937	7452	7448	4375
Trans-Nzoia	24459	17844	17829	14261
Turkana	20092	10501	10498	4141
Uasin Gishu	36310	32122	32103	28155
Vihiga	20825	17781	17779	7916
Wajir	835	282	282	15
West Pokot	3311	3343	3341	1983

4.5.2 Data analysis

1. To calculate the denominator and numerators for the HIV testing and treatment cascade indicators for the country as a whole, insert the formula =sum(B2:B48) in cell B49, and copy the formula across Column E in the same row.
2. HIV testing and treatment cascade indicator 1—the percentage of people living with HIV who know their status—is computed in Column F, wherein the numerator is the number of people living with HIV who know their HIV status (Column C) and the denominator is the estimated people living with HIV (Column B). Use formula C2/B2% in cell F2 and copy the formula all the way down to cell F49.
3. HIV testing and treatment cascade indicator 2—the percentage of people living with HIV who are on treatment—is computed in Column G, wherein the numerator is the number of people living with HIV who are on ART (Column D) and the denominator is the estimated people living with HIV (Column B). Use formula D2/B2% in cell G2 and copy the formula all the way down to cell G49.
4. HIV testing and treatment cascade indicator 3—the percentage of people living with HIV who have a suppressed viral load—is computed in Column H, wherein the numerator is the number of people living with HIV who are virally suppressed (Column E) and the denominator is the estimated people living with HIV (Column B). Use formula E2/B2% in cell H2 and copy the formula all the way down to cell H49.

Table 22

Estimated PLHIV, PLHIV who know their status, PLHIV on ART, PLHIV who are virally suppressed, and the ART Programme's 1st, 2nd, and 3rd HIV testing and treatment cascade indicators by county

A County	B Estimated PLHIV	C PLHIV who know their HIV status	D PLHIV on ART	E PLHIV who are virally suppressed	F HIV cascade indicator 1	G HIV cascade indicator 2	H HIV cascade indicator 3
Baringo	7777	6127	5614	3646	79	72	47
Bomet	15372	9031	9025	9352	59	59	61
Bungoma	30594	28449	28442	9420	93	93	31
Busia	36813	35463	35457	16775	96	96	46
Elgeyo-Marakwet	6722	4301	4299	6520	64	64	97
Embu	11017	10313	10312	8983	94	94	82
Garissa	1391	1394	1393	132	100	100	9
Homa Bay	122954	125221	125195	38256	102	102	31
Isiolo	3347	829	816	420	25	24	13

A	B	C	D	E	F	G	H
County	Estimated PLHIV	PLHIV who know their HIV status	PLHIV on ART	PLHIV who are virally suppressed	HIV cascade indicator 1	HIV cascade indicator 2	HIV cascade indicator 3
Kajiado	30255	16783	16758	9989	55	55	33
Kakamega	50991	44743	44722	25743	88	88	50
Kericho	22182	15333	15328	13006	69	69	59
Kiambu	46571	41349	41325	39341	89	89	84
Kilifi	29962	21602	21586	16868	72	72	56
Kirinyaga	13502	11847	11845	11020	88	88	82
Kisii	42842	37219	37204	25972	87	87	61
Kisumu	130036	111818	111787	72050	86	86	55
Kitui	27919	22269	22258	15580	80	80	56
Kwale	19140	10906	10892	7109	57	57	37
Laikipia	9130	9925	9921	6949	109	109	76
Lamu	2568	1704	1704	512	66	66	20
Machakos	34889	30432	30364	17567	87	87	50
Makueni	21644	23785	23770	16327	110	110	75
Mandera	2190	800	800	56	37	37	3
Marsabit	2717	1144	1123	8	42	41	0
Meru	31186	21942	21930	18655	70	70	60
Migori	77690	75673	75666	38659	97	97	50
Mombasa	54303	48835	48807	36128	90	90	67
Murang'a	21550	17126	17110	10666	79	79	49
Nairobi	153818	163379	163289	113047	106	106	73
Nakuru	58678	45990	45979	27034	78	78	46
Nandi	18681	12318	12310	9346	66	66	50
Narok	21848	10377	10373	7969	47	47	36
Nyamira	16691	15663	15659	8040	94	94	48
Nyandarua	10570	10448	10443	8088	99	99	77
Nyeri	16522	19031	19024	18472	115	115	112
Samburu	9307	1944	1941	1538	21	21	17
Siaya	97922	98016	98007	72464	100	100	74
Taita-Taveta	9952	7175	7169	4872	72	72	49
Tana River	2259	1370	1369	522	61	61	23
Tharaka-Nithi	7937	7452	7448	4375	94	94	55
Trans-Nzoia	24459	17844	17829	14261	73	73	58
Turkana	20092	10501	10498	4141	52	52	21
Uasin Gishu	36310	32122	32103	28155	88	88	78
Vihiga	20825	17781	17779	7916	85	85	38
Wajir	835	282	282	15	34	34	2
West Pokot	3311	3343	3341	1983	101	101	60
TOTAL	1437267	1261399	1260296	807947	88	88	56

4.5.3 Data presentation and interpretation

County-wise treatment targets (Figures 38-40)

Figures 38, 39, and 40 primarily use data in Sheet "ART" of "Toolkit_County" Excel Workbook on the estimated people living with HIV (Column B) and the 1st, 2nd, and 3rd HIV cascade indicators (Columns F, G, and H). For creating these figures, copy Sheet "ART" into a new sheet as values and rename that sheet as Figure38, and follow the steps below:

1. Delete Columns C, D, and E as well as Row 49 as these data are not used for this figure.
2. Sort data by "estimated PLHIV" (Column B) from largest to smallest.
3. Plot estimated PLHIV (in lines and in secondary Y axis) and "HIV cascade indicator 1" (in clustered columns, and on primary Y axis), as shown in Figure 38 (copied from Excel Sheet Figure38).
4. Plot estimated PLHIV (in lines and in secondary Y axis) and "HIV cascade indicator 2" (in clustered columns, and on primary Y axis), as shown in Figure 39 (copied from Excel Sheet Figure38).
5. Plot estimated PLHIV (in lines and in secondary Y axis) and "HIV cascade indicator 3" (in clustered columns, and on primary Y axis), as shown in Figure 40 (copied from Excel Sheet Figure38).

Figure 38. County-wise estimated people living with HIV and achievement of HIV cascade indicator 1: Percentage of people living with HIV who know their status

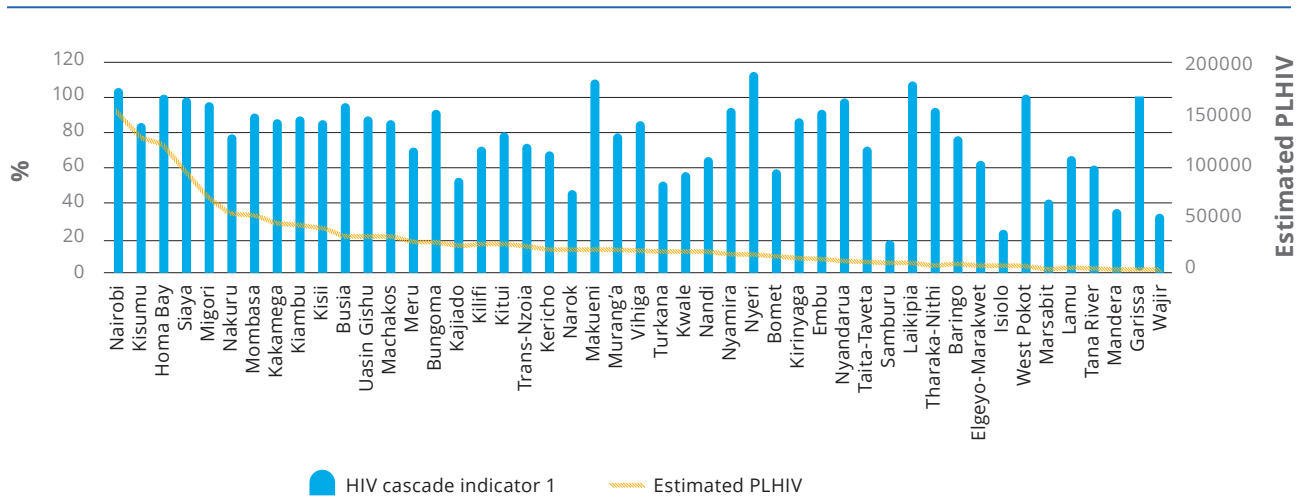


Figure 39. County-wise estimated people living with HIV and achievement of HIV cascade indicator 2: Percentage of people living with HIV who are on treatment

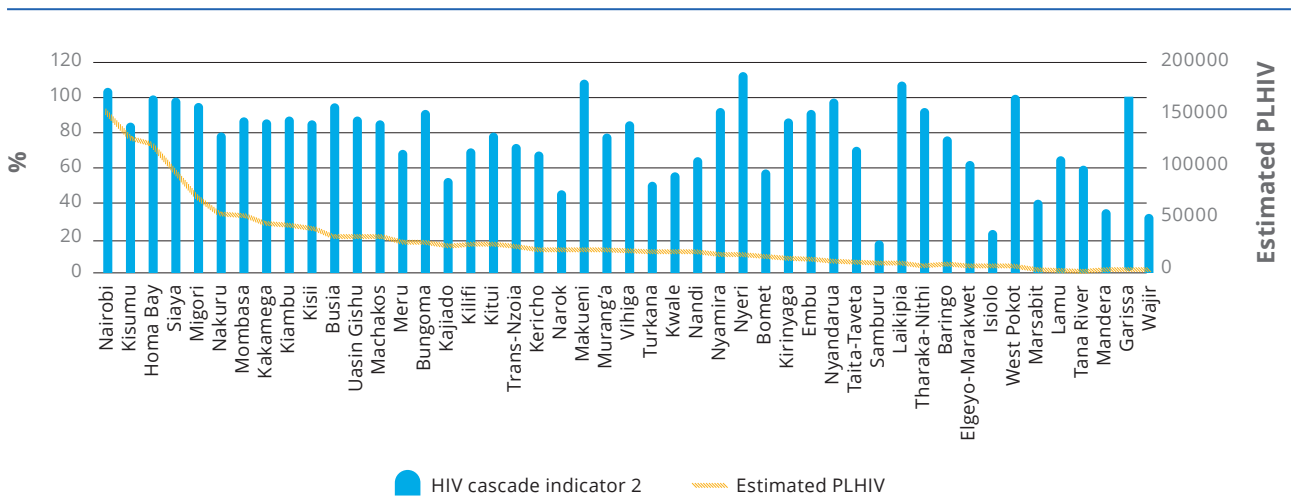
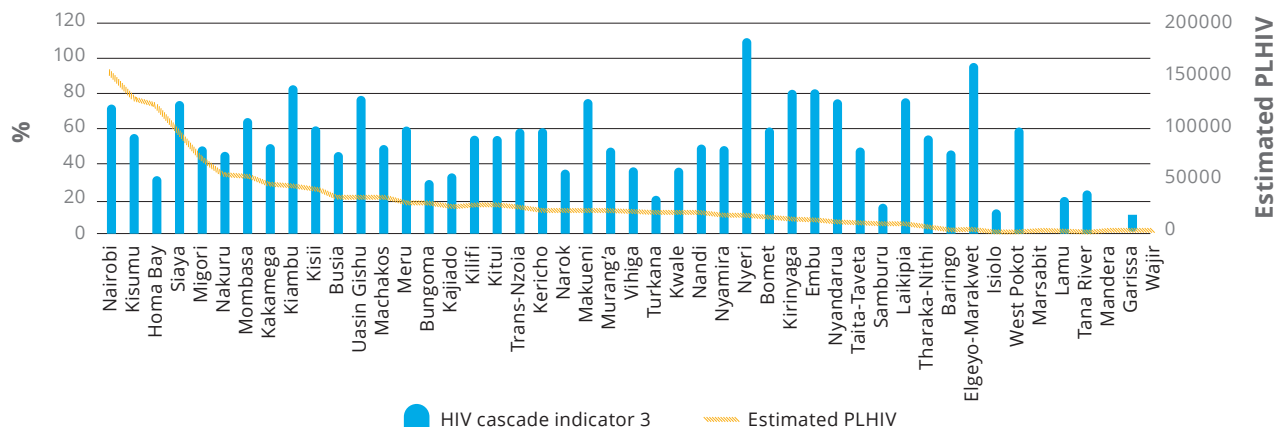


Figure 40. County-wise estimated people living with HIV and achievement of HIV cascade indicator 3: Percentage of people living with HIV who have a suppressed viral load



Figures 38–40 may be interpreted as follows:

1. Eleven counties have achieved the first HIV cascade indicator target (i.e., at least 95% of people living with HIV in these counties know their HIV status). These counties along with their estimated number of people living with HIV are: Nyeri (16500), Makueni (21600), Laikipia (9130), Nairobi (153800), Homa Bay (122900), West Pokot (3100), Garissa (1400), Siaya (97900), Nyandarua (10500), Migori (77700), and Busia (36800). Among the four generalising epidemics, Kisumu is the only county that has not yet achieved the first indicator.
2. The same eleven counties that have achieved the first HIV cascade indicator target have also achieved the second HIV cascade indicator target (i.e., at least 90% of people living with HIV are on treatment).
3. Only two counties (Nyeri and Elgeyo-Marakwet), both with relatively low estimates of people living with HIV, have achieved the third HIV cascade indicator target (i.e., at least 86% of people living with HIV have a suppressed viral load). However, Elgeyo-Marakwet’s data should be reviewed, because it reports more HIV-positive people virally suppressed than on ART. It is critical to review the quality of data before such analysis.

The HIV testing and treatment cascade at the sub-county level

The ART Programme gaps at the sub-county level are analysed in Sheet “art” of the “Toolkit_Subcounty” Excel Workbook. Examples of the results for four counties—Kisumu, Mombasa, Nairobi, and Nakuru—are presented in Figures 41–44.

Figure 41. Sub-county-wise estimated people living with HIV and the HIV testing and treatment cascade, Kisumu County

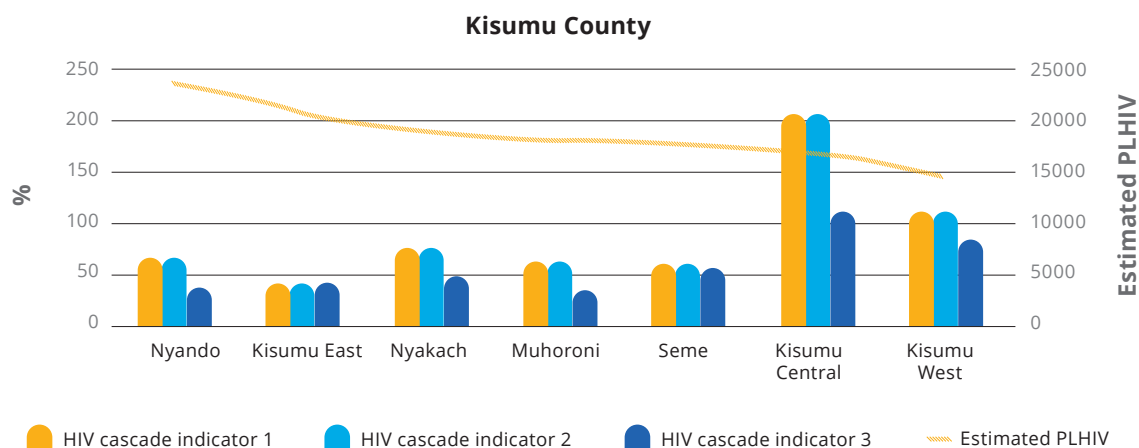


Figure 42. Sub-county-wise estimated people living with HIV and the HIV testing and treatment cascade, Mombasa County

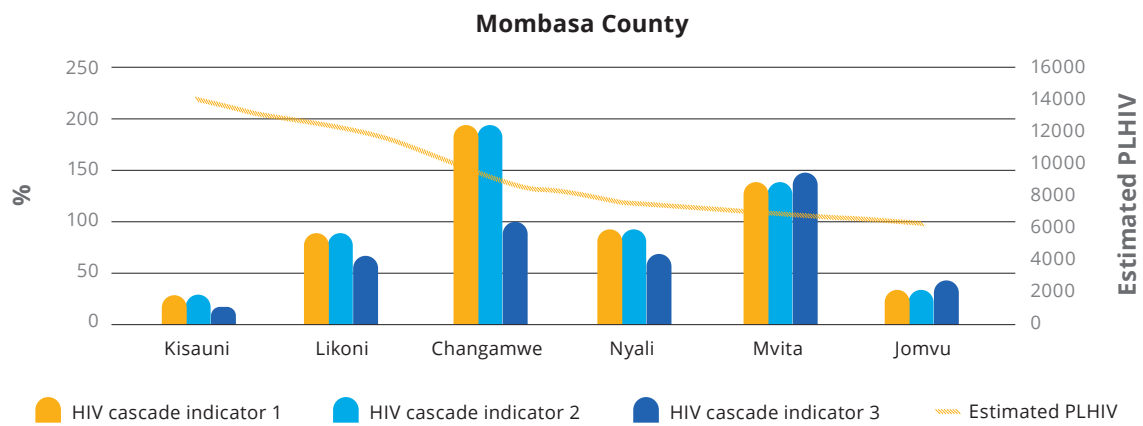


Figure 43. Sub-county-wise estimated people living with HIV and the HIV testing and treatment cascade, Nairobi County

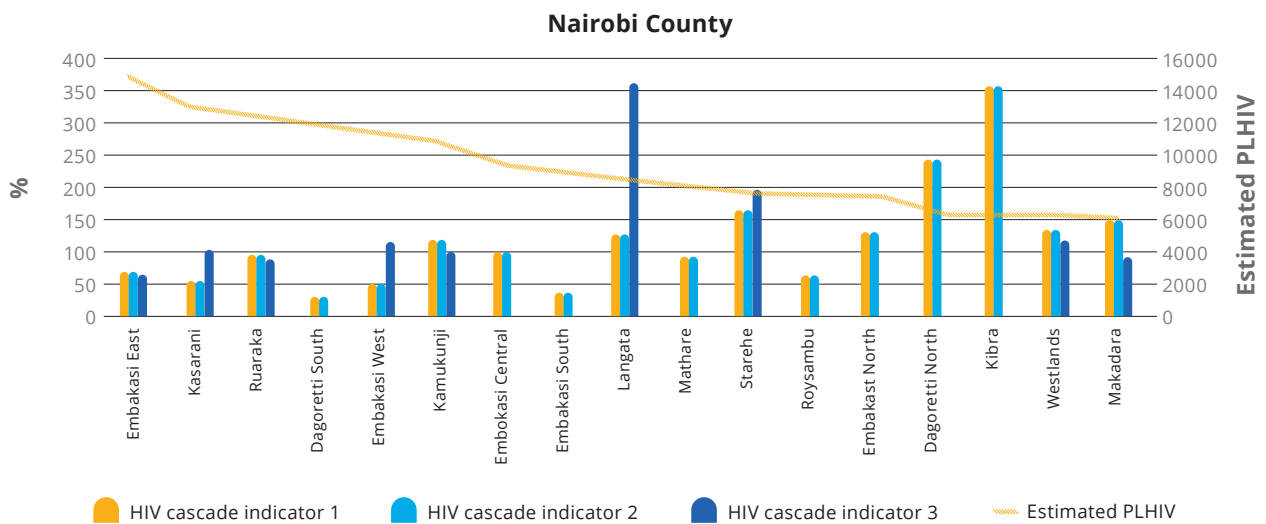
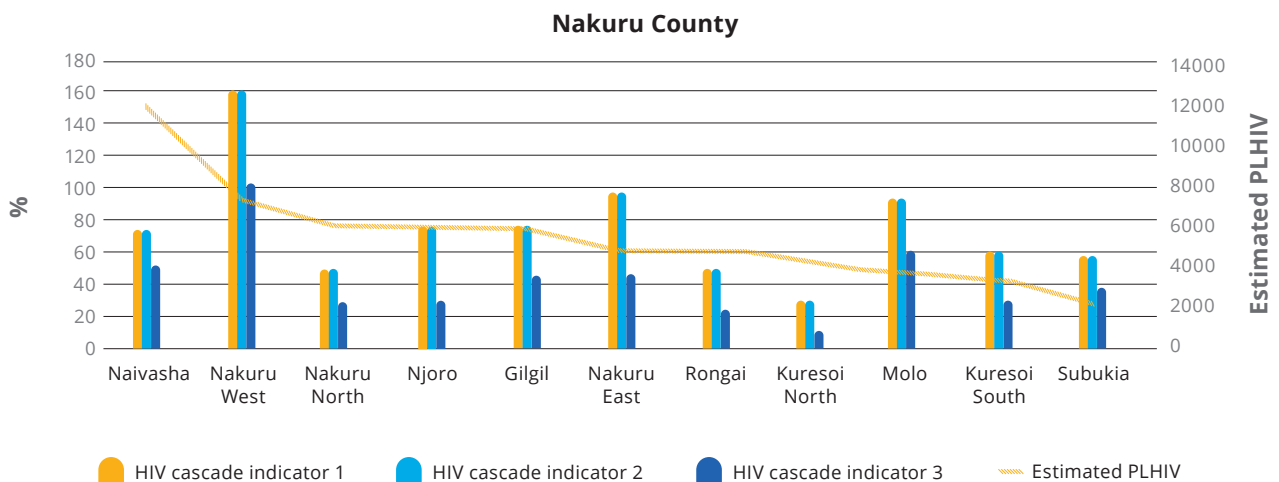


Figure 44. Sub-county-wise estimated people living with HIV and the HIV testing and treatment cascade, Nakuru County



Prioritisation of interventions based not only on disease burden and epidemic typology but also on the prevailing gaps in coverage is a key aspect of this appraisal. Programme gap analysis helps in identifying counties where certain programmes and services need scaling up and are underutilised. In each county, the programmes that are most underutilised need to be optimised, depending on the county's disease burden and epidemic typology. For instance, Nairobi, a mixed epidemic with the largest disease burden in terms of new acquisitions, needs to optimise its Adolescents and Young People Programme and VMMC Programme. Kisumu, which is a generalising epidemic, and which has the second-largest number of new acquisitions, needs to increase coverage of interventions among key populations (especially the people who inject drugs population), fisherfolk, adolescent girls and young women, and uncircumcised men. The programme gap analysis will additionally help to generate hypotheses or research questions.

The National Multisectoral HIV Prevention Acceleration Plan 2023–2030¹⁶ of the Government of Kenya's National Syndemic Diseases Control Council prioritised nine counties with greater disease burden—Nairobi, Kisumu, Homa Bay, Siaya, Migori, Nakuru, Kakamega, Usain Gishu, and Kajiado—for greater impact. Based on the epidemic typology of a county and sub-county, the combination of HIV prevention programmes was adjusted, and counties were trained in epidemic appraisal at the sub-county level. While the Acceleration Plan has committed to strengthening outcome measurement, it is too early to measure how these plans have resulted in changes to local epidemic trajectories.

Although an advantage of this approach to sub-national epidemic appraisal is that it used all secondary data, with no additional data collected for the purpose, its limitation has been the quality of data. Inconsistency in data collection methods, changes in reporting standards, and variation in data quality across time and sources might have affected the accuracy and comparability of the findings across counties.

Contact coverage of over 100%, particularly among men who have sex with men, could largely be due to the underestimation of the size of the men who have sex with men population coupled with the possibility of certain populations being double counted, as in some counties multiple partners are implementing programmes with men who have sex with men. This epidemic appraisal did not evaluate the quality of the Spectrum/EPP/Naomi model estimates or the routine programme monitoring data. While the model estimates are suspected to be less robust at the county level than at the national level, the routine programme monitoring could be subject to under-reporting and double-counting, which are common to most health management information systems. Data gaps, particularly regarding resource allocations and programme targets, limited the identification of gaps in the planned coverage of various HIV prevention programmes.

¹⁶ National Syndemic Diseases Control Council. 2023. National Multisectoral HIV Prevention Acceleration Plan 2023–2030. Nairobi: NSDCC. <https://nsdcc.go.ke/download/national-multisectoral-hiv-prevention-acceleration-plan-2023-2030/>

ANNEX 1

Regional level HIV epidemic appraisal: Meru County, 2023

Contents

1. Objectives	63
2. Epidemic Appraisal	63
2.1 Geographic prioritisation	63
2.2 Epidemic typology	65
2.3 Programme gaps	66
3. How Meru County Used the Epidemic Appraisal to Improve the HIV Prevention Programme in the County ..	73

1. Objectives

The objectives of this appraisal of the HIV epidemic in Meru County are as follows:

1. To identify high-burden sub-counties for geographic prioritisation by analysing HIV prevalence and incidence at the sub-county level
2. To define epidemic typology and prioritise populations by analysing population size and HIV prevalence at the sub-county level
3. To assess programme coverage by analysing routine programme monitoring data

2. Epidemic Appraisal

2.1 Geographic prioritisation

Analysis of HIV prevalence and incidence by population for geographic prioritisation

Data compilation/preparation

The most recent information on HIV incidence in 2022 was obtained from the NSDCC's model-based estimates. The estimated number of new infections (adults and children) is based on the most recent model-based estimates. HIV prevalence in the general population aged 15–49 is also based on model estimates for 2022.

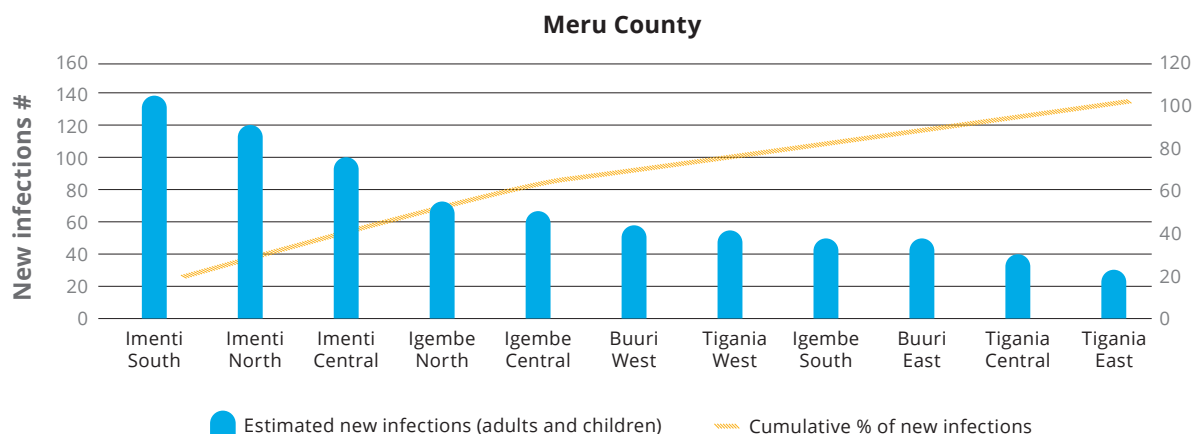
Table 1

HIV incidence, new infections, and prevalence by sub-county, Meru County, 2022. (See Figure 1 in Toolkit_Subcounty Excel Workbook)

A	B	C	D
Sub-county	HIV incidence per 1,000 (2022)	Estimated new Infections (adults and children)	HIV prevalence (%) in general population age 15-49 (2022)
Imenti South	0.84	138	3.61
Imenti North	0.86	120	3.20
Imenti Central	0.93	100	4.15
Igembe North	0.54	73	1.96
Igembe Central	0.38	67	1.50
Buuri West	0.91	58	3.81
Tigania West	0.50	54	1.86
Igembe South	0.38	51	1.62
Buuri East	0.83	50	2.89
Tigania Central	0.49	41	2.03
Tigania East	0.51	30	1.78

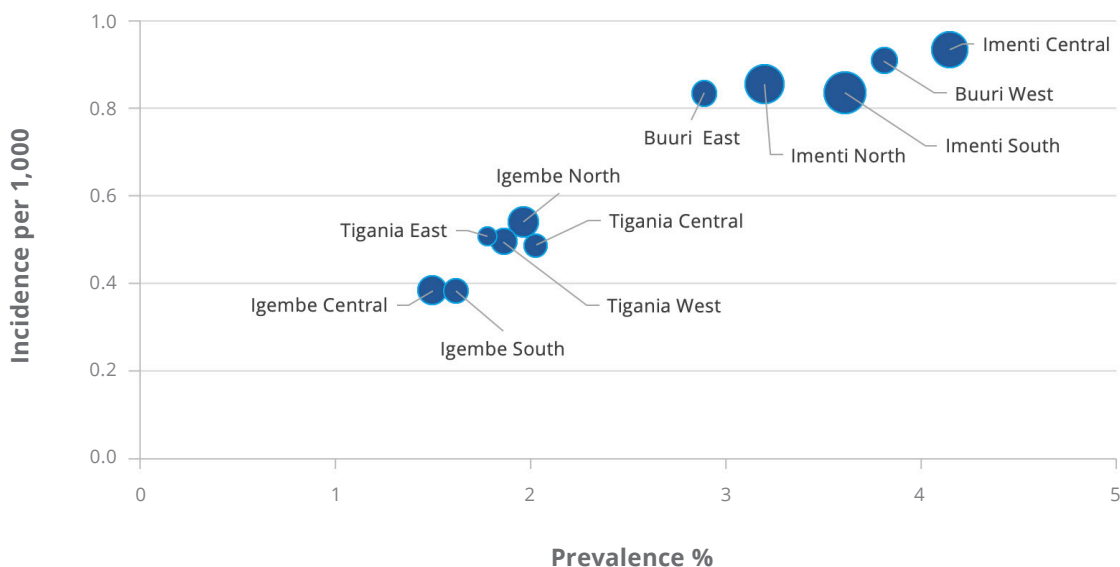
Data presentation and interpretation

Figure 2: Sub-counties contributing a high proportion of new infections



Eight sub-counties with more than 51 new infections accounted for 85% of all new infections in Meru County. Four high-burden sub-counties—Imenti South, Imenti North, Imenti Central, and Igembe North—with more than 73 new infections accounted for 55% of new infections.

Figure 2: Sub-counties with new infections



On all three counts—incidence, prevalence, and the estimated new infections—five sub-counties (Imenti South, Imenti North, Imenti Central, Buuri East, and Buuri West) emerge as priority sub-counties within Meru.

2.2 Epidemic typology

Characterising the epidemic typology is key for correctly prioritising population groups for HIV prevention. For this epidemic appraisal, epidemic typology was categorised as a) concentrated, b) generalising, or c) mixed.

Table 2

Epidemic classification matrix for sub-counties

GP Prevalence	Low (<3%)			Medium (3%–9%)			High (10%+)		
KP Density	L (<20%)	M (20%–29%)	H (30%+)	L (<20%)	M (20%–29%)	H (30%+)	L (<20%)	M (20%–29%)	H (30%+)
	Concentrated	Concentrated	Mixed	Mixed	Mixed	Mixed	Mixed	Generalising	Generalising

Using the epidemic typology classification matrix (Table 2), which utilised two data sets, namely a) HIV prevalence in the general population, and b) key population density (number of key populations per 1000 men in the population), sub-counties in Meru were categorised by epidemic typology (Table 3).

Table 3

Epidemic typology classification by sub-county, Meru County

Subcounty	HIV prevalence in the general population aged 15–49 (from the master list)	Key population size estimates (from master list)*			Number of men aged 15–64	Total KP members	# of KP members per 1,000 men aged 15–64 years	Epidemic typology (County)	Epidemic typology (Sub-county)
		FSWs	MSM	PWID					
Buuri East	3%	221	0	0	27325	348	13	Concentrated	Concentrated
Buuri West	4%	97	0	0	29860	348	12		Mixed
Igembe Central	1%	800	0	0	72133	348	5		Concentrated
Igembe North	2%	240	0	0	51247	348	7		Concentrated
Igembe South	2%	703	0	0	53961	348	6		Concentrated
Imenti Central	4%	293	1026	60	47560	348	7		Mixed
Imenti North	3%	323	0	0	66302	348	5		Mixed
Imenti South	4%	21	0	0	74794	348	5		Mixed
Tigania Central	2%	44	0	0	32498	348	11		Concentrated
Tigania East	2%	0	93	5	20650	348	17		Concentrated
Tigania West	2%	0	93	5	42966	348	8		Concentrated

As Meru had updated KP population size estimates data, the appraisal used updated data. Hence this data may be different from the data available in Toolkit_Subcounty Excel Workbook.

Though the overall HIV epidemic typology in Meru County was characterised as concentrated, further analysis of the sub-counties revealed that seven sub-counties have a concentrated epidemic typology, while four have a mixed epidemic typology.

Programmatic strategy for concentrated epidemics: Geographical areas experiencing concentrated epidemics should prioritise achieving high coverage of the following: a) HIV testing of pregnant women and treatment for pregnant women living with HIV, b) prevention programmes targeting key populations and their sexual and injecting networks, and c) treatment adherence programme for people living with HIV to maintain viral suppression.

Programmatic strategy for mixed epidemics: In addition to the strategies mentioned for concentrated epidemics, the appropriate intervention for mixed epidemics is to expand the scale of effective and targeted HIV prevention programmes to reduce transmission in other priority populations, such as adolescent girls and young women and adolescent boys and young men.

Based on the assessment of the epidemic at the sub-county level, the seven sub-counties with a concentrated epidemic and the four sub-counties with a mixed epidemic should prioritise the aforementioned sub-populations.

2.3 Programme gaps

This epidemic appraisal considers gaps in programme contact coverage to identify sub-counties and populations where programmes and services need scaling up.

2.3.1 Prevention of Mother-to-Child Transmission (PMTCT) Programme coverage gaps

Data and sources

Programme	Coverage indicator	Numerator	Denominator
PMTCT Programme	% of estimated pregnant women tested for HIV	# of pregnant women tested for HIV (KHIS, January–December 2022)	Estimated # of pregnant women (Spectrum/EPP/Naomi model estimates for 2021)
PMTCT Programme	% of estimated HIV-positive pregnant women on ART	# of HIV-positive pregnant women on ART (KHIS, January–December 2022)	Estimated HIV-positive pregnant women (Spectrum/EPP/Naomi model estimates for 2021)

Table 4

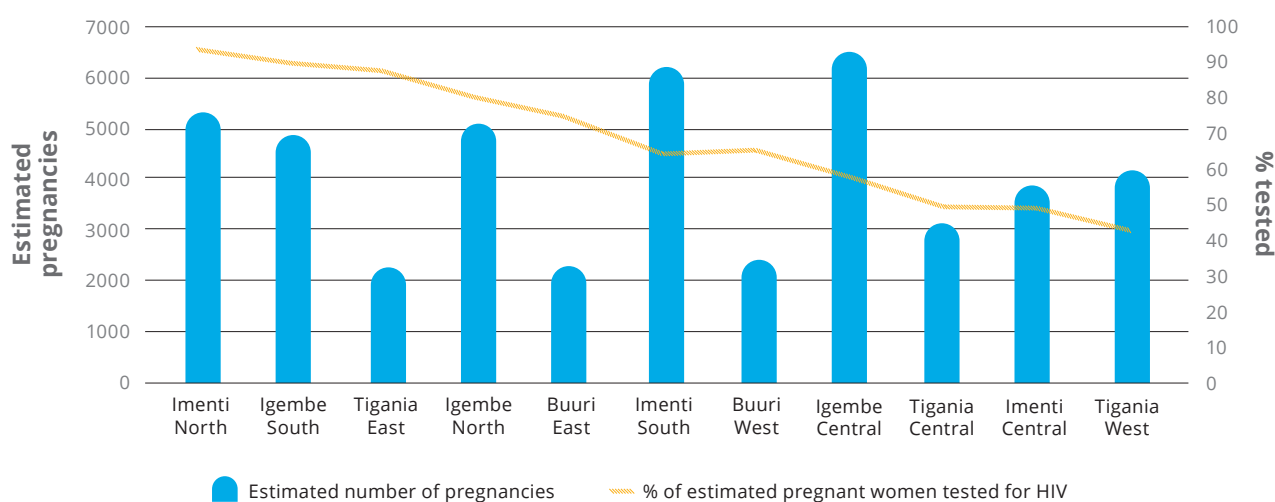
Estimated number of pregnancies, number of pregnant women tested for HIV, estimated PMTCT need, number of HIV-positive pregnant women on ART, percentage of estimated HIV-positive pregnant women tested for HIV, and percentage of estimated HIV-positive pregnant women on ART by sub-county, Meru County. As Meru County is using more updated data, the data may not match the data for Meru County in Toolkit_Subcounty Excel Workbook.

A	B	C	D	E	F	G
Sub-county	Estimated number of pregnancies	# of pregnant women tested for HIV at ANC, L&D, PNC (Jan-Dec)	% of estimated pregnant women tested for HIV	Estimated PMTCT need	# of HIV-positive pregnant women on ART	% of estimated HIV-positive pregnant women on ART
Buuri East	2,277	1675	73.6	48	43	88.8
Buuri West	2,409	1543	64.1	68	36	53.0
Igembe Central	6,453	3608	55.9	71	50	70.1
Igembe North	5,042	3966	78.7	73	44	60.4
Igembe South	4,831	4273	88.4	58	100	173.5
Imenti Central	3,864	1889	48.9	122	49	40.3
Imenti North	5,284	4817	91.2	124	147	118.2
Imenti South	6,128	3946	64.4	163	122	74.7
Tigania Central	3,082	1527	49.5	46	10	21.7
Tigania East	2,199	1893	86.1	29	20	69.7
Tigania West	4,079	1698	41.6	56	33	58.9

HIV testing gap among pregnant women

Measurement of this gap primarily uses data on the estimated number of pregnancies (Column B in Table 4) as per model estimates and the number of pregnant women tested for HIV at ANC, L&D, PNC (Column C) as reported in KHIS MoH 731. This gap is calculated as the percentage of estimated pregnant women tested for HIV (Column D).

Figure 3: Estimated number of pregnancies and percentage of estimated pregnant women tested for HIV by sub-county, Meru County

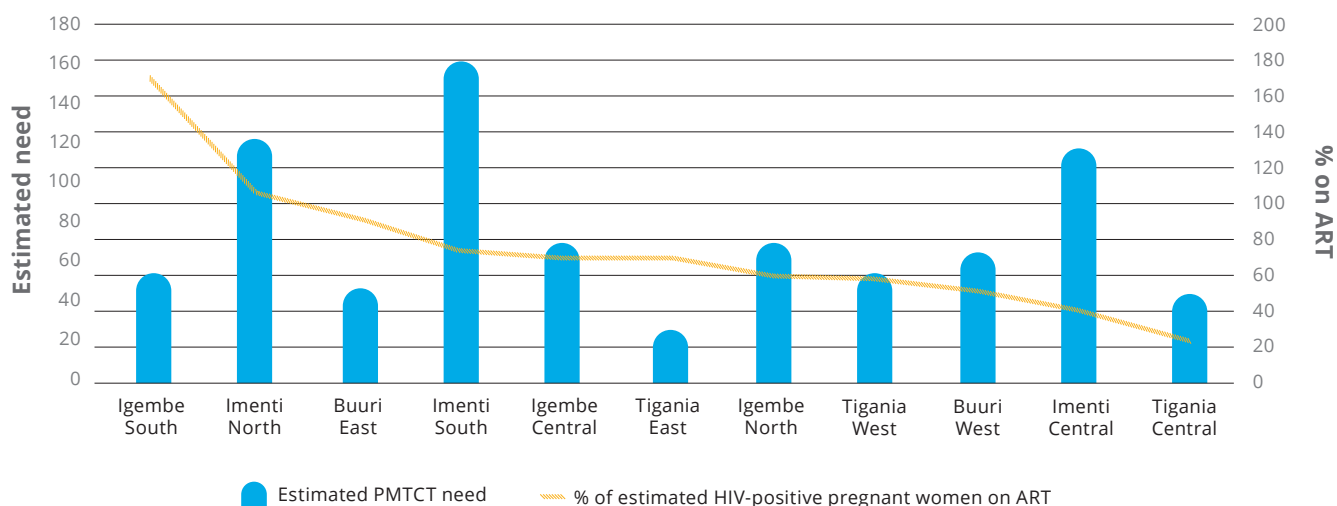


The HIV testing rate among pregnant women is below 80% in eight out of 11 sub-counties (Figure 3). Only Imenti North, Igembe South, and Tigania East have achieved coverage of more than 80%. In three sub-counties (Tigania Central, Imenti Central, and Tigania West), the coverage is less than 50%. These counties are priority counties for strengthening the Prevention of Mother-to-Child Transmission Programme and addressing the gaps.

Gaps in ART coverage among pregnant women

Measurement of the ART coverage gap uses data on the estimated number of pregnant women living with HIV (PMTCT need) as shown in Column E of Table 4 as per model estimates and the percentage of estimated HIV-positive pregnant women on ART (Column G, Table 4) as reported through KHIS MoH 731.

Figure 4: Estimated PMTCT need and % of estimated HIV-positive pregnant women on ART by sub-county, Meru County



More than 80% of the estimated pregnant women living with HIV were on ART in three of Meru's 11 sub-counties (Igembe South, Imenti North, and Buuri East) (Figure 4). Two sub-counties, Imenti Central and Tigania Central, had less than 50% of pregnant women living with HIV on ART. These counties are priority counties for strengthening the Prevention of Mother-to-Child Transmission Programme and addressing the gaps.

Imenti Central and Tigania Central are struggling in terms of HIV testing for pregnant women and ensuring that pregnant women living with HIV are receiving ART. These are priority sub-counties for the Prevention of Mother-to-Child Transmission Programme in Meru.

2.3.2 Key Populations Programme coverage gaps

Data and Sources

Programme	Coverage indicator	Numerator	Denominator
Key Populations Programme	% of FSW/MSM/PWID who received at least one service in the last quarter	# of FSW/MSM/PWID who received at least one service in the last quarter (KHIS, quarter ending December 2022)	# of FSW/MSM/PWID (Key population size estimation report, 2020)

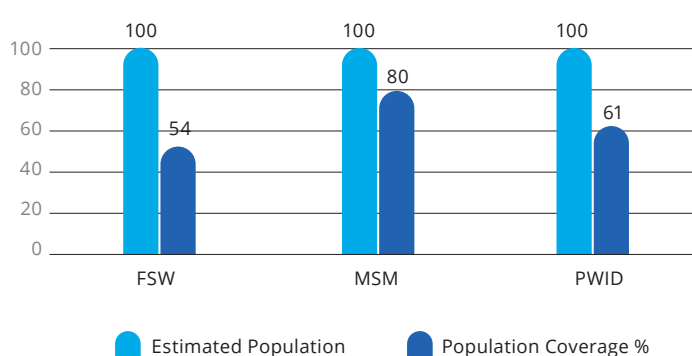
For the Key Populations Programme, only contact coverage gaps are measured since the donor targets for the year 2022 are not available. The contact coverage gap is the difference between the number of key population members who received at least one service and the estimated key population size (i.e., the proportion of key population members who received no service in the last quarter).

Table 5

Key population size estimates, key population members who received at least one service, and contact coverage by sub-county, Meru County (2022). As Meru County is using more updated data, hence the data may not match the data for Meru County in Toolkit_Subcounty Excel Workbook

Sub-county	Key population size estimates, 2022			KP members who received at least one service (October-December 2022, active KP, MoH 731 plus, KHMIS)			Contact coverage %		
	FSWs	MSM	PWID	FSWs	MSM	PWID	FSWs	MSM	PWID
Buuri East	221	0	0	6	0	0	3	0	0
Buuri West	97	0	0	38	0	0	39	0	0
Igembe Central	800	0	0	8	0	0	1	0	0
Igembe North	240	0	0	43	0	0	18	0	0
Igembe South	703	0	0	10	0	0	1	0	0
Imenti Central	293	1026	60	21	34	43	7	3	72
Imenti North	323	0	0	24	0	0	7	0	0
Imenti South	21	0	0	969	0	0	4614	0	0
Tigania Central	44	0	0	367	0	0	834	0	0
Tigania East	0	93	5	0	633	0	0	681	0
Tigania West	0	93	5	0	307	0	0	330	0

Figure 5: Contact coverage by key population, Meru County



Overall, in 2022, 54% of female sex workers, 80% of men who have sex with men, and 61% of people who inject drugs were contacted by programmes with services (Figure 5). This reveals significant disparities in coverage for female sex workers, people who inject drugs, and men who have sex with men.

Key Populations Programme coverage—female sex workers

Programme coverage assessment primarily uses data on the estimated female sex worker population and the female sex worker contact coverage.

Figure 6: Estimated population and contact coverage among female sex workers by sub-county, Meru County

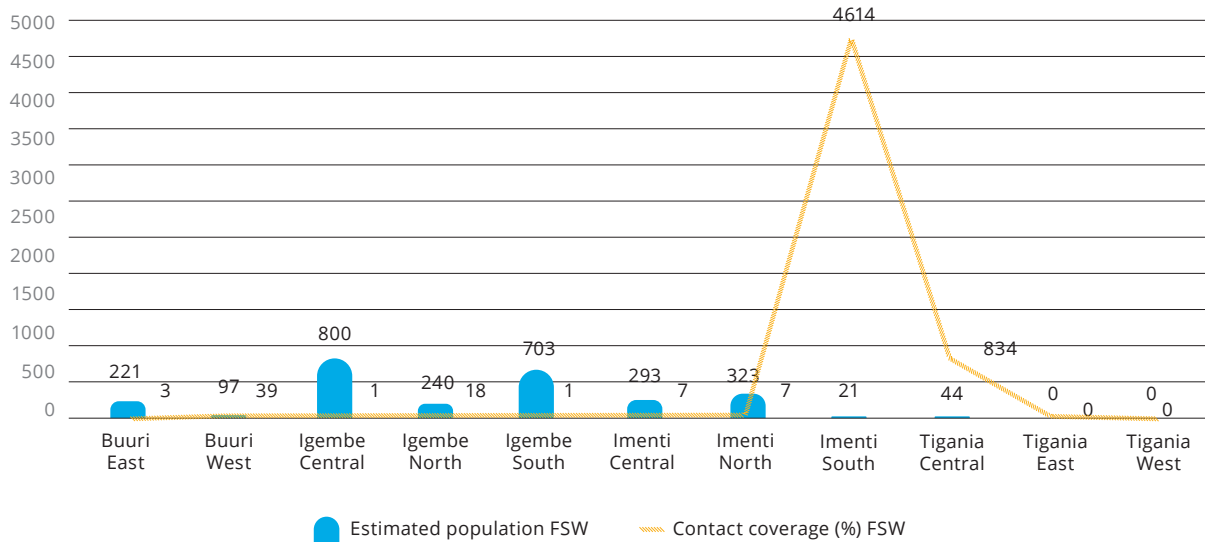
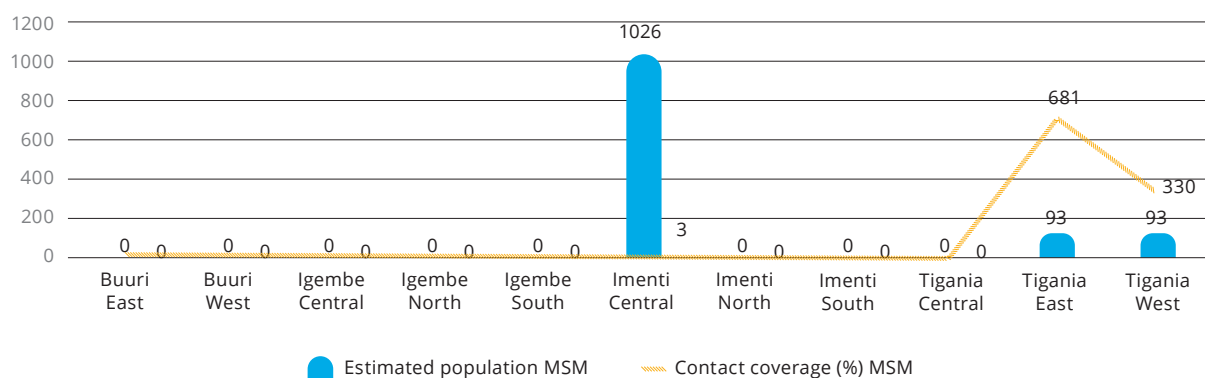


Figure 6 shows that the female sex worker programme in Igembe South, Igembe Central, Buuri East, Imenti Central, and Imenti North requires more attention and intensity to address the gaps. Although the coverage in Imenti South and Tigania Central is high, the quality of data needs to be reviewed to ensure accuracy.

Key Populations Programme coverage—men who have sex with men

Programme coverage assessment primarily uses data on the estimated population of men who have sex with men and the men who have sex with men contact coverage.

Figure 7: Estimated population and contact coverage among men who have sex with men by sub-county, Meru County

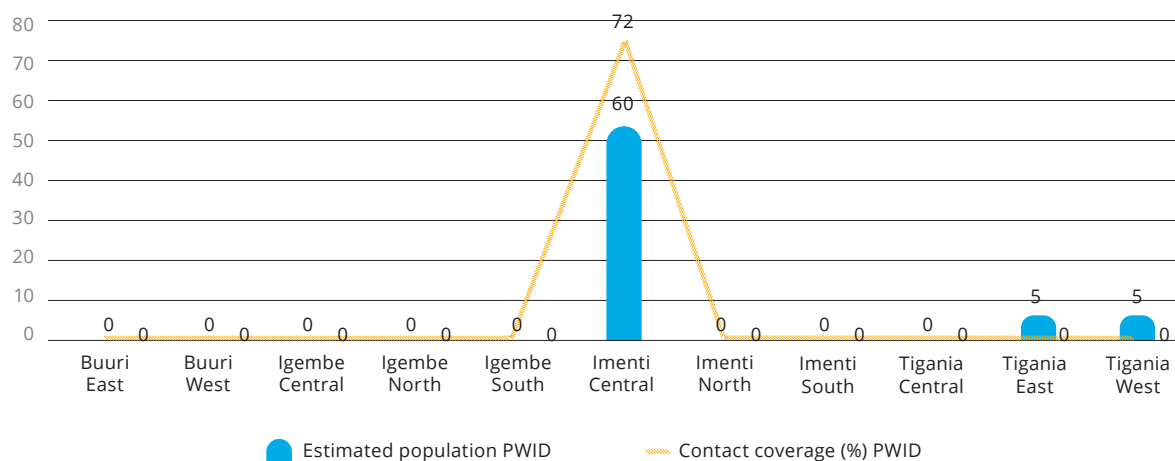


The men who have sex with men programme needs improvement in Imenti Central. The programme should also assess whether there are other men who have sex with men who have not been accounted for in other sub-counties and are being excluded. The data quality of the programme in Tigania East and West needs to be evaluated.

Key Populations Programme coverage—people who inject drugs

Programme coverage assessment primarily uses data on the estimated number of people who inject drugs and the contact coverage among people who inject drugs.

Figure 8: Estimated population and contact coverage among people who inject drugs by sub-county, Meru County



The people who inject drugs programme needs further scaling up in Imenti Central. The programme should also assess whether there are other people who inject drugs who have not been accounted for in other sub-counties and are being excluded.

2.3.3 Adolescents and Young People Programme

Programme	Coverage indicator	Numerator	Denominator
Adolescents and Young People Programme	% of AGYW/ABYM aged 15–24 years tested for HIV in the year	# of AGYW/ABYM 15–24 years tested for HIV in the year (KHIS, 2022)	of AGYW/ ABYM 15–24 in need of HIV prevention services (estimated by UNAIDS in 2021)

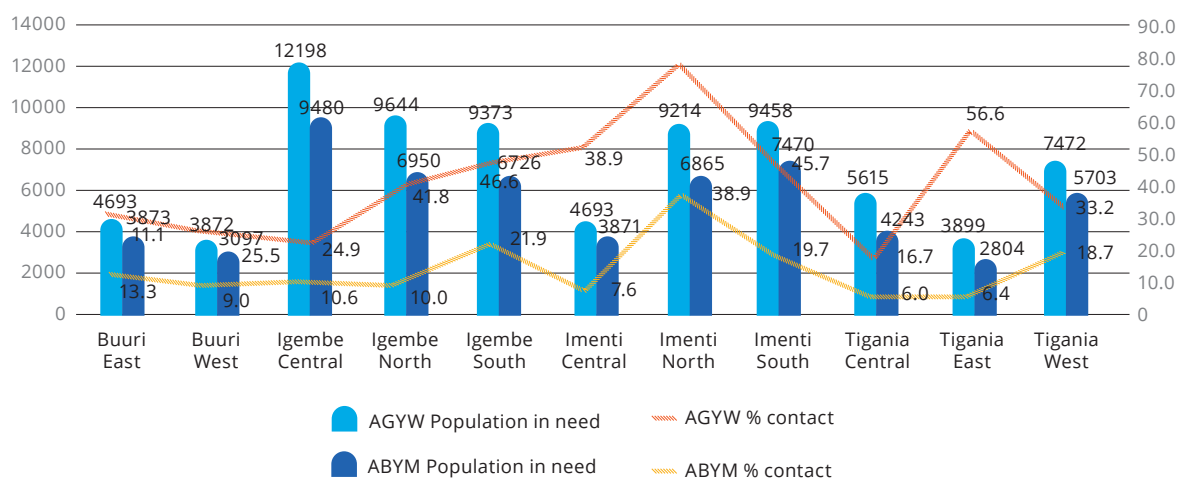
The contact coverage gap is measured as the percentage of the estimated number of adolescent girls and young women / adolescent boys and young men (15–24 years) (AGYW/ABYM) in need of HIV prevention (based on UNAIDS KPSE, 2022) against those who received at least one service (i.e., HIV testing, as per HMIS MoH 731) in 2022.

Table 6

Need, contact, and contact coverage among adolescent girls and young women and adolescent boys and young men by sub-county, Meru County. As Meru County is using more updated data, the data may not match the data for Meru County in Toolkit_Subcounty Excel Workbook

Sub-county	AGYW population in need	AGYW contacted	ABYM population in need	ABYM contacted	AGYW % contact coverage	ABYM % contact coverage
Buuri East	4693	1458	3871	513	31.1	13.3
Buuri West	3872	988	3097	278	25.5	9.0
Igembe Central	12198	3034	9480	1009	24.9	10.6
Igembe North	9644	4030	6950	695	41.8	10.0
Igembe South	9373	4371	6726	1475	46.6	21.9
Imenti Central	4693	2457	3871	295	52.4	7.6
Imenti North	9214	7051	6865	2672	76.5	38.9
Imenti South	9458	4324	7470	1468	45.7	19.7
Tigania Central	5615	937	4243	255	16.7	6.0
Tigania East	3899	2205	2804	180	56.6	6.4
Tigania West	7472	2480	5703	1069	33.2	18.7

Figure 9: Need for HIV prevention and contact coverage among adolescent girls and young women and adolescent boys and young men by sub-county, Meru County



Only four out of 11 sub-counties have a mixed epidemic and therefore require interventions with adolescent girls and young women and adolescent boys and young men. Among these four sub-counties, most are performing poorly in terms of HIV prevention service coverage for adolescent boys and young men. While Imenti North has higher coverage among adolescent girls and young women, the adolescent girls and young women programme may need to be strengthened in Burri West. Additionally, there are other sub-counties with a concentrated epidemic that are focusing on adolescents and young people. A resource allocation plan needs to be developed to ensure that focus and resources on populations are based on epidemic typology.

3. How Meru County Used the Epidemic Appraisal to Improve the HIV Prevention Programme in the County

Meru County has utilised the epidemic appraisal in the following ways:

1. Review of County AIDS Integrated Plans (CAIPs)

Meru County is currently in its third year of implementing CAIPs. The county conducted a mid-term review of the CAIPs, incorporating the findings of the epidemic appraisal conducted by the county to reevaluate the geographical areas and populations requiring prioritised HIV prevention efforts.

2. Refocusing the Key Populations Programme

The Key Populations Programme has been implemented since 2018. After conducting the epidemic appraisal, the county identified the Key Populations Programme as a priority intervention, considering its concentrated epidemic typology. Consequently, the county has initiated the Key Populations Programme in geographies that had not yet started the programme. The epidemic appraisal helped the county identify coverage gaps in the female sex workers programme, which the county has prioritised for scaling up to address the sub-counties that are lagging behind.

3. Revision of annual workplans

Through the epidemic appraisal, the county has identified programmatic gaps that need to be addressed. These gaps are being incorporated into the annual plans being developed by the county's programmes, with a specific focus on sub-counties where the gaps are particularly pronounced.

ANNEX 2

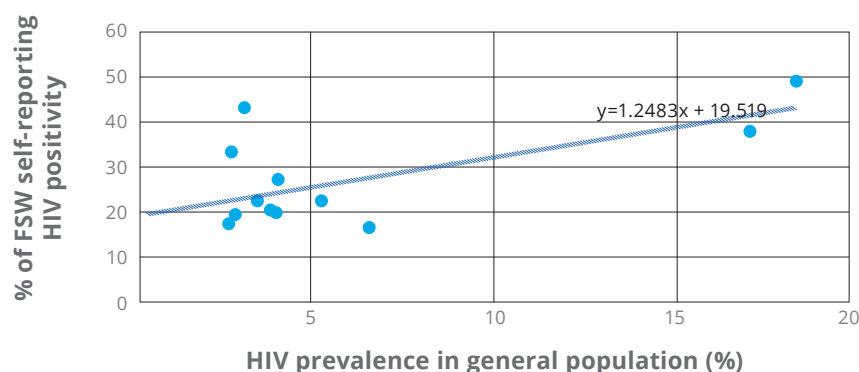
HIV prevalence in key populations

Since the polling booth survey estimates of self-reported HIV positivity among female sex workers, men who have sex with men, and people who inject drugs are available only for 12, 6, and 4 of the 47 counties, respectively, we will be estimating HIV prevalence among the key populations in all the counties. The HIV prevalence among the key populations is estimated using the intercept and slope values derived from regressing the general population estimates for all counties on the available key population estimates from polling booth surveys.

We first estimate the relationship between HIV prevalence in a key population, say female sex workers, as per the PBS, and the HIV prevalence in the general population, using linear regression. By default, counties with missing values are excluded. Subsequently, we use the regression coefficients (constant or the intercept and the slope or the beta coefficient) to re-estimate the HIV prevalence among female sex workers in each county. Below are the specific steps for the estimation of HIV prevalence among female sex workers using this method. These steps need to be repeated for the estimation of HIV prevalence among men who have sex with men and people who inject drugs.

1. Compute the constant in cell L2 for HIV prevalence among female sex workers using the Excel formula INTERCEPT, which calculates the point at which a line will intersect the y-axis by using existing x-values and y-values, based on a best-fit regression line plotted through the known x-values and known y-values. Here the known y-axis values are the county-wise % of female sex workers reporting HIV-positive status (B6:B52) and the county-wise HIV prevalence in the general population (E6:E52) are the x-axis values.
2. Compute the beta coefficient (β) in cell L3 for HIV prevalence among female sex workers using the Excel formula SLOPE, which calculates the slope of the linear regression line through data points in y-values and x-values, which is the vertical distance divided by the horizontal distance between any two points on the line, which is the rate of change along the regression line. As in the above step, here the known y-axis values are the county-wise % of female sex workers reporting HIV-positive status (B6:B52) and the county-wise HIV prevalence in the general population (E6:E52) are the x-axis values.
3. The constant and beta coefficients can also be determined by creating a scatter plot of the two variables: % of female sex workers reporting HIV positivity and HIV prevalence in the general population and adding a trendline with the equation displayed on the chart. Note that the beta coefficient and the constant obtained using the Excel formula and the trendline in the graph are the same.

Relationship between self-reported HIV status among female sex workers and HIV prevalence in general population



4. Next, the HIV prevalence among the female sex workers in the first county is estimated in cell J6 using the formula (constant + beta coefficient*GP prevalence): $L2 + L3 * E6$. Since the constant and beta coefficient will be the same for the remaining counties, the reference to cells L2 and L3 will be locked using the key F4 when the cursor is on L2 and L3. Thus, the final formula in cells L6 will be $L\$2+L\$3*E6$. Now copy this formula to the rest of the counties, from L7 to L52. These are the estimated HIV prevalence among female sex workers.

5. Repeat steps 1–4 for the men who have sex with men and people who inject drugs in Columns M and N.

A	K	L	M	N
County	Estimated HIV prevalence			
		FSWs	MSM	PWID
	Constant	19.5192	19.2413	17.8394
	β	1.2483	-0.3030	0.3100
Baringo		21.6	18.7	18.4
Bomet		22.9	18.4	18.7
Bungoma		22.7	18.5	18.6
Busia		27.8	17.2	19.9
Elgeyo-Marakwet		22.0	18.6	18.5
Embu		22.3	18.6	18.5
Garissa		20.0	19.1	18.0
Homa Bay		42.7	13.6	23.6
Isiolo		21.5	18.7	18.3
Kajiado		23.7	18.2	18.9
Kakamega		24.1	18.1	19.0
Kericho		23.8	18.2	18.9
Kiambu		22.9	18.4	18.7
Kilifi		23.7	18.2	18.9
Kirinyaga		23.2	18.4	18.7
Kisii		25.7	17.7	19.4
Kisumu		41.1	14.0	23.2
Kitui		24.3	18.1	19.0
Kwale		23.2	18.4	18.8
Laikipia		22.6	18.5	18.6
Lamu		22.3	18.6	18.5
Machakos		23.6	18.3	18.8
Makueni		23.5	18.3	18.8
Mandera		19.8	19.2	17.9
Marsabit		20.6	19.0	18.1
Meru		22.8	18.4	18.7
Migori		34.3	15.7	21.5
Mombasa		27.6	17.3	19.9
Murang'a		22.6	18.5	18.6
Nairobi		26.0	17.7	19.4
Nakuru		24.2	18.1	19.0
Nandi		23.2	18.3	18.8

A	K	L	M	N
County	Estimated HIV prevalence			
		FSWs	MSM	PWID
	Constant	19.5192	19.2413	17.8394
	β	1.2483	-0.3030	0.3100
Narok		22.9	18.4	18.7
Nyamira		24.4	18.1	19.0
Nyandarua		22.5	18.5	18.6
Nyeri		24.4	18.1	19.0
Samburu		20.7	18.9	18.1
Siaya		39.8	14.3	22.9
Taita-Taveta		23.8	18.2	18.9
Tana River		20.6	19.0	18.1
Tharaka-Nithi		22.9	18.4	18.7
Trans-Nzoia		24.6	18.0	19.1
Turkana		23.3	18.3	18.8
Uasin Gishu		26.5	17.6	19.6
Vihiga		25.3	17.8	19.3
Wajir		19.8	19.2	17.9
West Pokot		20.9	18.9	18.2



National Syndemic Diseases Control Council

Landmark Plaza, 9th Floor,

Argwings Kodhek Road

P.O. Box 61307 – 00200

Nairobi, Kenya

Phone: +254 20 2715109, +254 20 2715144

Email: communication@nsdcc.go.ke

Partners for Health and Development in Africa

5th Ngong Avenue Suites

7th Floor, Room 7-9, Ngong Road

PO Box 3737-00506

Nairobi, Kenya

Phone: +254202101155

Email: info@phdaf.org