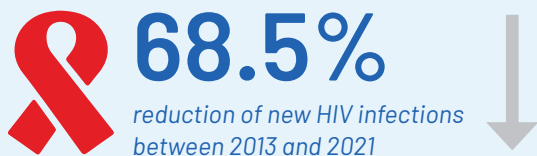# HIV PREVENTION DELIVERY LANDSCAPE IN KENYA

HIV EPIDEMIC APPRAISAL IN KENYA

Identifying priority geographies, populations and programmes for optimising coverage for HIV prevention

Globally, Kenya has the fifth largest HIV epidemic. Kenya has made tremendous strides in HIV prevention programming.

68.5%
reduction of new HIV infections between 2013 and 2021

In 2020, the national HIV prevalence among adults was 4.3%, twice as high among women, at 5.5%, as compared to men at 2.9%[1,2].

In 2014, Kenya committed to prioritise and scale up HIV prevention interventions with the development of the Kenya HIV Prevention Revolution Roadmap 2030 [3]. It also set an ambitious target of reducing new HIV incidence by 75% with the development and launch of the Kenya AIDS Strategic Framework 2014/15-2018/19 [4]. However, the country was not able to achieve its HIV prevention targets by 2019[1] and has reprioritised reducing new HIV infections as one of the objectives of the Kenya AIDS Strategic Framework II, 2019/20-2024/25 [5].

To prioritise the HIV prevention agenda and accelerate the response, the National AIDS and STI Control Programme (NASCOP) and the National AIDS Control Council (NACC) in partnership with University of Manitoba conducted an HIV prevention landscape assessment during 2020-21.

The assessment aimed to understand the following:

The geographies, populations, and programmes to be prioritised for HIV prevention within Kenya

The platforms and delivery channels preferred by the priority populations for provision of HIV prevention services

The capacity of the health system to scale up HIV prevention

This Evidence Brief presents the findings on the geographies, populations, and programmes to be prioritised for an effective HIV prevention response in Kenya through a new epidemic appraisal approach that considers HIV incidence/prevalence, epidemic typology, and programme gaps across the different counties in Kenya.

KEY QUESTIONS

Which are the geographies that Kenya should prioritise for HIV prevention to achieve its goal of new infections reduction by 75%?

Which are the populations that Kenya should prioritise in these geographies?

What programmes and services should be strengthened and/or scaled up in these geographies and populations?

A. Epidemic Appraisal Approach [6]

National HIV prevention policies guided by the ongoing local epidemiological dynamics are likely to be more effective in stemming the course of an epidemic. Such policies enable the development of programmes informed by the variations in transmission dynamics and drivers across geographies, thereby paving the way for more efficient responses. Traditional epidemic appraisal approaches, such as the numerical proxy and modes of transmission (MOT), which utilise the current HIV prevalence and incidence distribution data, provide only short-term metrics. Approaches that yield accurate and timely guidance on the status and drivers of ongoing local transmission, epidemic heterogeneity and trajectory are critical. The epidemic appraisal approach discussed below factors in county-wise heterogeneity in HIV incidence/prevalence, typology, and gaps in programme coverage.
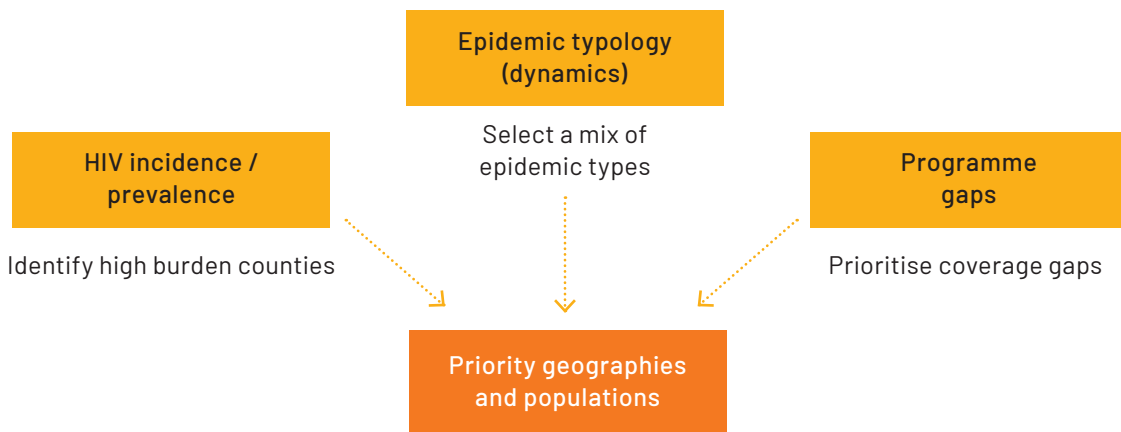

Figure 1: Epidemic appraisal approach

The epidemic appraisal used three different approaches:

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

A.1

Analysis of HIV prevalence and incidence

The appraisal used HIV incidence and prevalence in Kenya as the primary measures for determining county-level disease burden and prioritising geographies. Additional measures included the incidence-prevalence ratio (IPR) and the county-wise number of new infections based on incidence and population size. Model-based estimates from NACC for 2020 provided the basis for HIV incidence and prevalence data at the national and county levels. The approach used data on prevalence, incidence, and the annual number of new infections to prioritise the counties. Additionally, we estimated the county-wise number of new infections averted with a 20% reduction in IPR to achieve over 75% reduction in new infections in the country.

A.2

Analysis of population size and HIV prevalence

Population size and HIV prevalence were the two primary measures used to define epidemic typology. We categorised the epidemic types using the estimated size of local high-risk sexual networks and estimated HIV prevalence in general and key populations (KP). The Key Population Size Estimation report (KPSE II) [7], 2020, provided the estimated size of female sex workers (FSW) and men who have sex with men (MSM) within each county. We derived the HIV prevalence estimate in KPs within each county using self-reported HIV status by representative samples of KP members in Polling Booth Surveys (PBS) conducted in 2017[1]. Model-based estimates from NACC for 2020 formed the basis for calculating HIV prevalence among the general population. The appraisal grouped counties into three epidemic types: concentrated (in KPs and networks), generalising (in segments of the general population), and mixed (combination of key and the general population).

A.3

Analysis of routine prevention programme data

The appraisal considered two types of programme gaps - planned and contact coverage gaps - to identify counties where programmes and services needed scaling up and were under-utilised.

Planned coverage gap measured allocation of resources for programming set aside to cover an estimated population size.

Contact coverage gap measured the extent to which the programmes with resources to meet a specific sub-population have reached them.

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[1] National AIDS & STI Control Programme, Ministry of Health. 2018. Third National Behavioural Assessment of Key Populations in Kenya: Polling Booth Survey Report. Nairobi: NASCOP. The appraisal considered self-reported HIV positivity in the PBS as the HIV prevalence among FSWs in 12 counties and MSM in six counties. We estimated HIV prevalence among FSWs in the remaining counties using the derived constant and coefficient from a linear regression fitting the prevalence in the general population (KENPHIA, 2018) and HIV prevalence in KPs as per the PBS. In counties where we did not conduct the PBS, the appraisal estimated the HIV prevalence for MSM using the constant and coefficient from a linear regression fitting the MSM size estimate and HIV prevalence as per the PBS.

We analysed the gaps in the following HIV prevention programmes in Kenya:

Prevention of Mother to Child Transmission (PMTCT) programme

The analysis did not consider the planned coverage gap for this programme as PMTCT services were widely available. It measured the contact coverage gap through testing coverage (i.e., percentage of estimated pregnant women tested for HIV) and HAART coverage (i.e., percentage of estimated HIV-positive pregnant women on HAART). Kenya Management Information Systems (MIS) data for January to December 2020 provided the number of pregnant women tested for HIV and the number of pregnant HIV-positive women on HAART. The analysis used estimated pregnancy in the county as the denominator to assess HIV testing coverage or estimated need. It used the estimated HIV-positive pregnant women in the county as the denominator to determine HAART coverage.

Key Population (KP) Programme

For the KP programme, the analysis measured the planned coverage gap through the availability of resources or donor funding for the coverage of KPs. Coverage here refers to the percentage of KPs planned to be covered by donors or targets provided by the donors to the partners in a specific county. It assessed the contact coverage gaps by measuring the reach of a KP by at least one service, i.e., the percentage of KPs receiving at least one service in the last quarter. The NASCOP KP Quarterly report for October – December 2020 provided the data for targets allocated by donors. The KHIS report for October – December 2020 provided the number of KPs reached by one service. The denominator for this assessment or estimated need is the KP size estimates derived from the Key Population Size Estimation Report, 2020.

Adolescent Girls and Young Women (AGYW) programme

In the AGYW programme, the analysis measured the planned coverage gap as to the availability of resources or donor funding for coverage of AGYW, i.e., the percentage of AGYW planned to be covered by donors or targets provided by the donors to the partners in a specific county. It measured the contact coverage gap in terms of reach of an AGYW by at least one service, i.e., the percentage of AGYW receiving one service in the last quarter. The KHIS report for December 2020 gave the data for targets allocated by donors and the number of AGYW reached by one service. The analysis used the number of AGYW who need HIV services, calculated at 32% of the total AGYW population (10-24 years) in the county [8], as the denominator or estimated need for this assessment.

Voluntary Medical Male Circumcision (VMMC) programme

The analysis of the VMMC programme assessed the planned coverage gap in terms of availability of resources or donor funding to conduct VMMC, i.e., the percentage of boys and men planned to be covered by donors or targets provided by the donors to the partners in a specific county. It measured the contact coverage gap in terms of reach of boys and men with VMMC services and conducting VMMC, i.e., the percentage of men and boys who underwent circumcision in the year. KHIS data for January to December 2020 provided the targets allocated by donors and the number of men and boys who underwent circumcision. The analysis used the number of men and boys uncircumcised in the county, as per the KENPHIA 2018 report, as the denominator or estimated need for this assessment.

Pre-Exposure Prophylaxis (PrEP) programme

There were numerous challenges in measuring the planned coverage gap in the PrEP programme, and hence we omitted this measure. The analysis measured the contact coverage gap in terms of the initiation of KPs on PrEP, i.e., the percentage of KPs initiating PrEP in the year. The KHIS data for January to December 2021 provided the number of KPs who started on PrEP. The analysis used the number of FSW and MSM in need of PrEP (defined as those who do not use condoms consistently) and the number of PWID who need PrEP (defined as those who share needles), as evidenced in the 2018 PBS report, as the denominator or estimated need for this assessment.

B.1

HIV Incidence and Prevalence

The appraisal identified high burden counties by analysing the data on HIV prevalence, incidence, incidence: prevalence ratio (IPR), and their contribution to new infections in the country[2]. The IPR is the number of new infections occurring per year in a population divided by the number of persons living with HIV in that same population [9]. The appraisal considered a global benchmark value of 0.3 as indicative of optimal trajectories[3].

B.1.1. Key counties contribute to a large proportion of new infections

Thirteen counties with more than 1000 new infections accounted for 72% of new infections in Kenya. Eight high burden counties - Kisumu, Nairobi, Siaya, Homa Bay, Migori, Nakuru, Mombasa, and Kisii - with more than 1500 new infections contributed to 57% of all new infections. The remaining five counties - Kakamega, Kiambu, Uasin Gishu, Kajiado, and Machakos - with more than 1000 new infections, contributed an additional 25% of all new infections in the country.
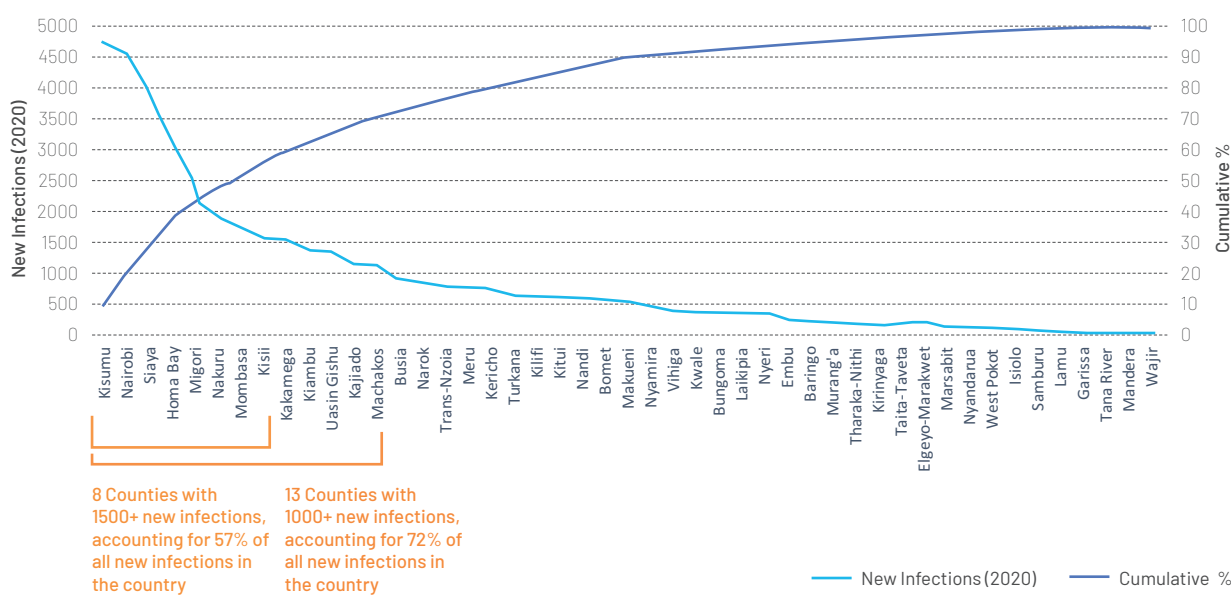

Figure 2: County wise new infections

B.1.2. Sizeable variability noted in IPR across counties

The IPR showed considerable county-wise variation, with 14 counties having an IPR of more than 0.03. Isiolo, Kericho, Turkana, Kakamega, Migori, Laikipia and Baringo had an IPR more than 0.03. Marsabit, Samburu, Siaya, Narok, Kisumu, Kisii and Kajiado had an IPR more than 0.04.
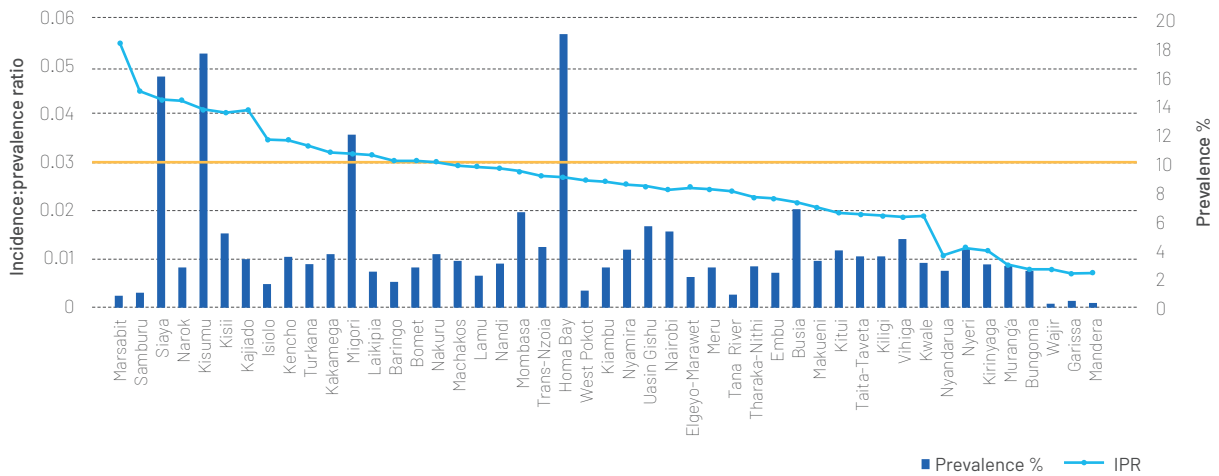

Figure 3: Incidence: Prevalence ratio across counties

B.1.3. A 20% reduction in IPR in every county can significantly reduce new HIV infections in Kenya

75% reduction in new HIV infections is feasible in Kenya if the country can reduce the IPR by 20% across all counties. The impact of IPR reduction will be highest in Nairobi, where it is possible to prevent more than 4000 new infections. In Kisumu, Homa Bay, Nakuru, Siaya and Migori, a 20% IPR reduction will prevent more than 1500 new infections each. New infections will fall by 1000 or more in five other counties, namely, Mombasa, Kakamega, Kisii, Kiambu, and Uasin Gishu.
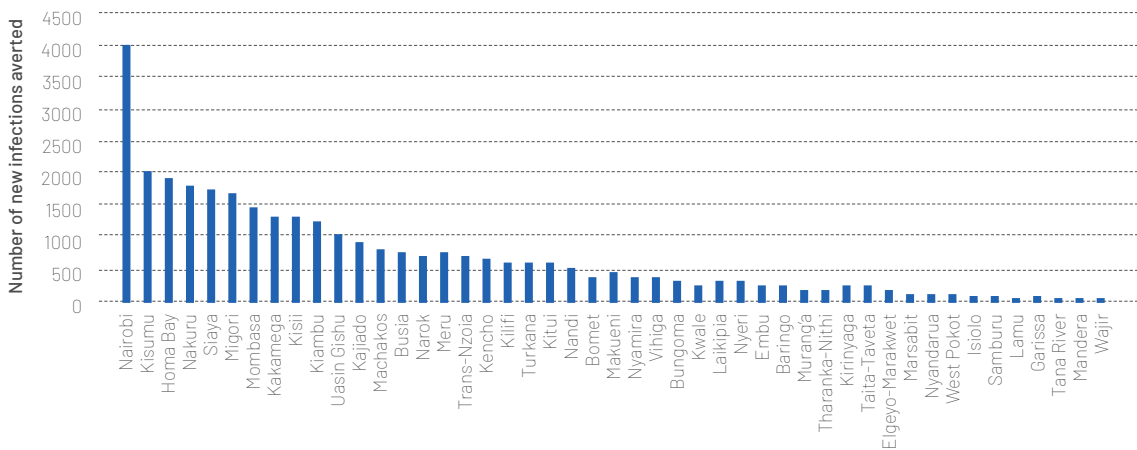

Figure 4: County-wise number of new infections averted with 20% reduction in IPR

Epidemic Typology Dynamics

In Kenya, the appraisal defined the epidemic typologies 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[6].

Epidemic Typologies: Definitions

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 HAART for those living with HIV.
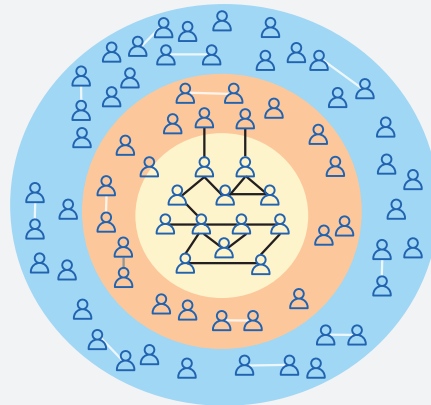
Generalising epidemics is where HIV transmission is mainly sustained by high-risk sexual behaviour in the general population, without any substantial contribution by defined subpopulation at risk. In all generalising epidemics, appropriate intervention should focus on changing sexual behaviour patterns 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 a high coverage of pregnant women for HIV testing and HAART for those living with HIV.
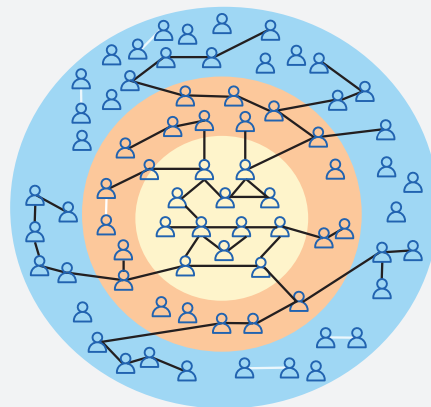
Mixed epidemics occur when there is a substantial contribution from the general population's sexual behaviour patterns and defined subpopulations at risk due to shared networks of higher risk practices. In a mixed epidemic, the programming focus should be on a dual strategy of changing sexual behaviour 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 HAART for those living with HIV.
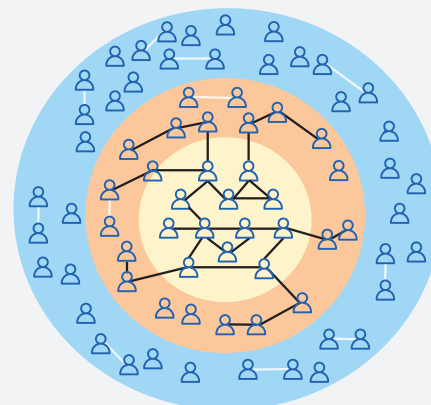
Black coloured lines indicate high risk sexual or needle sharing contact between individuals

The appraisal categorised the counties into these three epidemic types to support effective HIV prevention programming.

Countries with
- Concentrated epidemic
- Generalising epidemic
- Mixed epidemic
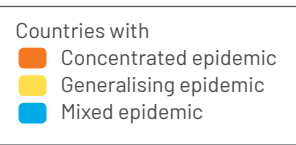
B.2.1. Concentrated epidemic in twenty-one counties

Geographies with a concentrated epidemic had a relatively large size of one or more key population groups (KPs), a high prevalence of HIV in KPs, and a low prevalence in the general population. In the 21 counties that showed a concentrated epidemic, there were 6 to 21 KPs for every 1000 men. HIV prevalence among KPs varied between 18-22% and was below 3% in the general population.
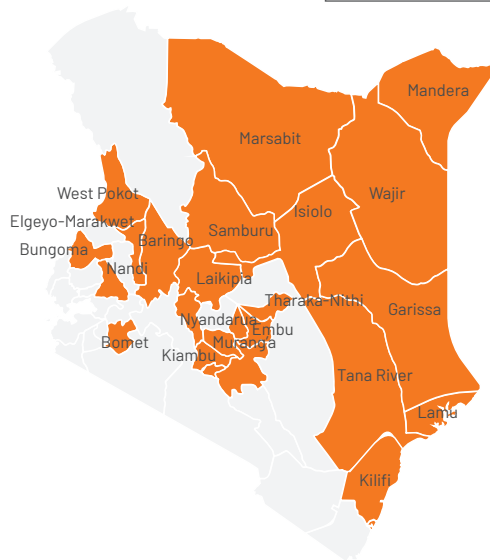
B.2.2. Four counties reflected a generalising epidemic

Counties that displayed a generalising epidemic had HIV prevalence among KPs and the general population, while the relative size of KP per 1000 men was lower. Four counties reflected a generalising epidemic, where HIV prevalence among GPs was more than 10%, among KPs was more than 30%, and the number of KPs varied between 10-20 for every 1000 men.
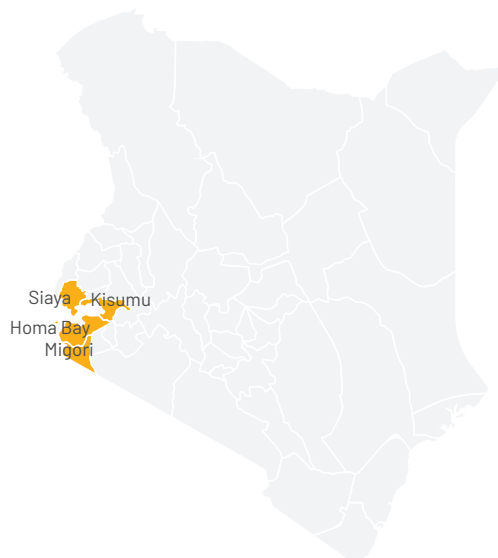
B.2.3. Twenty- two counties display a mixed epidemic

The appraisal classified 21 counties as having a mixed epidemic, with a relatively high HIV prevalence in KPs and the general population. HIV prevalence varied between 3-10% among GPs and between 23-30% among the KPs. There were 5-25 KPs for every 1000 men in these counties.

■→ B.3
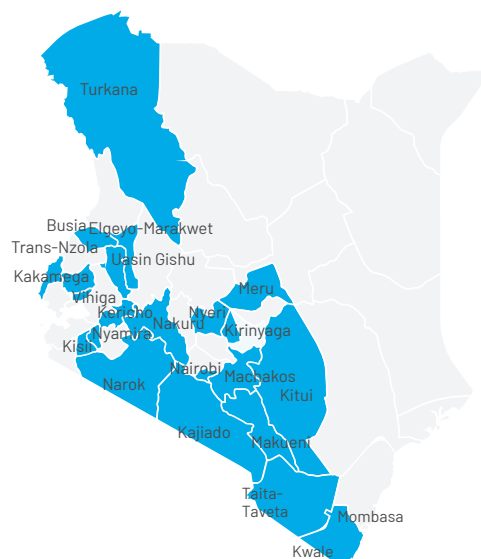
Programme Gaps

The assessment looked at gaps in the planned and contact coverage of programmes within different counties. Planned coverage assesses the allocation of resources for programming set aside to cover an estimated population size. Contact coverage helps determine the extent to which programmes resourced to meet a specific subpopulation have reached them. Key questions related to programme coverage are:

> Is there a good programme footprint?
>
> Are there enough resources?
>
> Are the resources in the right places reaching the right people?
>
> Are the resources able to make the right impact?

The appraisal used programme data from Kenya Health Information System (KHIS) to conduct this analysis.

B.3.1. PMTCT programme: Coverage shows testing gaps among pregnant women

Only 74% of the estimated pregnant women in the country had undergone HIV testing. The low HIV testing rate is also due to the low coverage of pregnant women in antenatal care, where pregnant women receive HIV tests. The HIV testing rate among pregnant women fell below the national average of 74% in 24 counties. In seven counties - Wajir, Mandera, Baringo, West Pokot, Marsabit, Garissa, and Kitui - 50% or fewer pregnant women underwent HIV testing at ANC. There is a need for more coordination with the maternal and child health programme to ensure that pregnant women access ANC services.
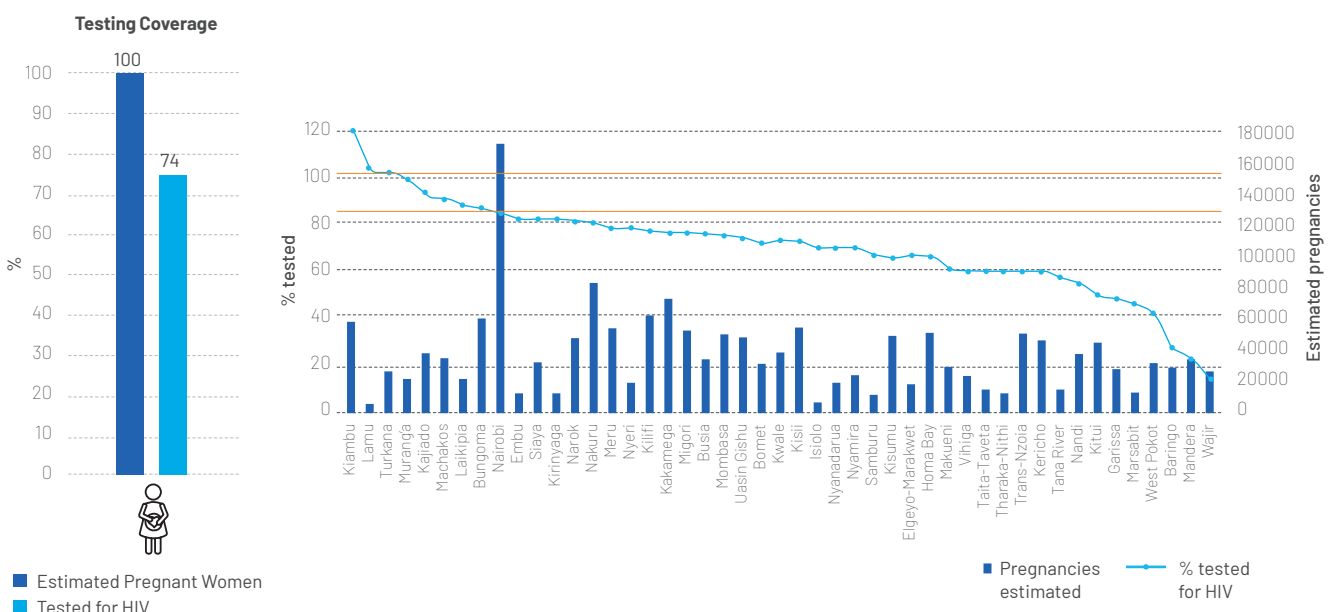

Figure 6: PMTCT HIV testing

However, among the pregnant women estimated with PMTCT need, 93% were on Highly Active Antiretroviral Therapy (HAART)[4]. More than 80% of the estimated women with PMTCT need were on HAART in all except 18 counties. Three counties, Mandera, Samburu, and Garissa, had lower than 50% of pregnant women living with HIV on HAART.

[4] Highly active antiretroviral therapy (HAART) is a treatment regimen typically comprised of a combination of three or more antiretroviral drugs. A key feature of HAART is the co-administration of different drugs that inhibit viral replication by several mechanisms so that the propagation of a virus with resistance to a single agent is inhibited by the action of the other two agents. https://www.ncbi.nlm.nih.gov/books/NBK554533/
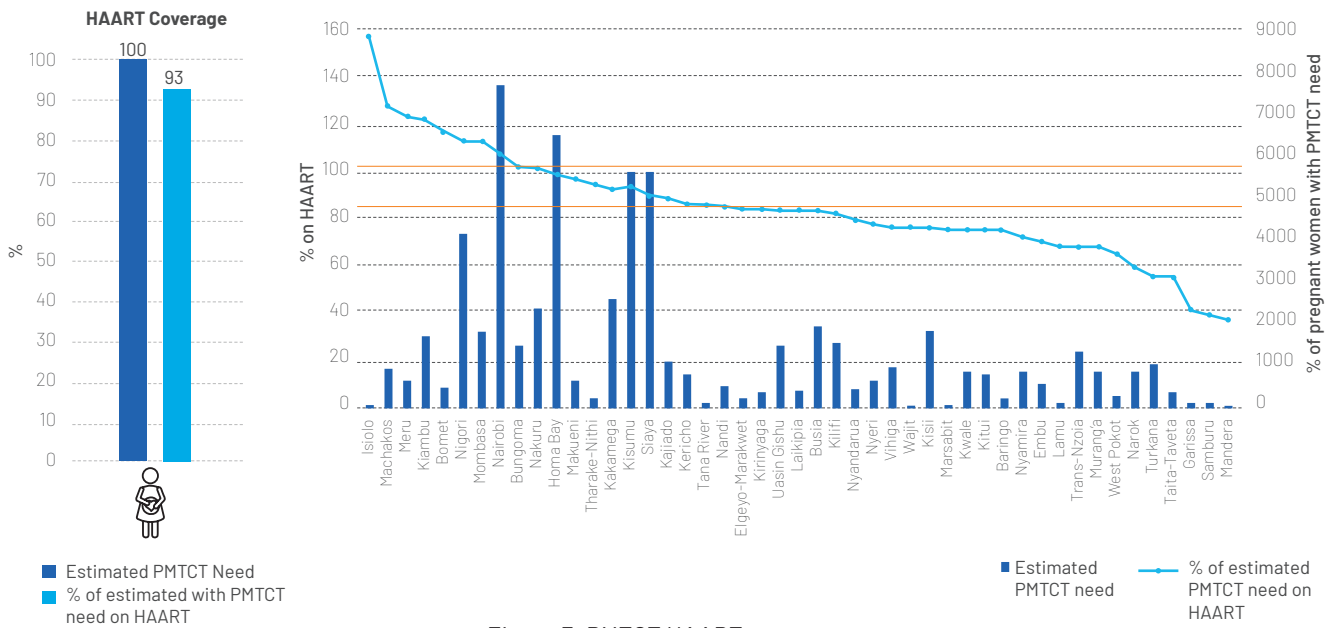
Figure 7: PMTCT HAART coverage

B.3.2. Key Population Programme: Gaps in planned and contact coverage highest for people who inject drugs and transgender people

Kenya has sufficient resources to reach only 82% of the estimated number of people who inject drugs (PWID) and 37% of the estimated number of transgender people. Contact coverage is also low for these two subpopulations. The resourced programmes reach only 73% of the estimated PWID and 27% of the estimated transgender people. For female sex workers (FSWs), although the planned coverage is high at 97%, there is some gap in contact coverage as the programmes reach only 84% of the estimated population. There is 100% planned and contact coverage for the estimated number of MSM in the country.
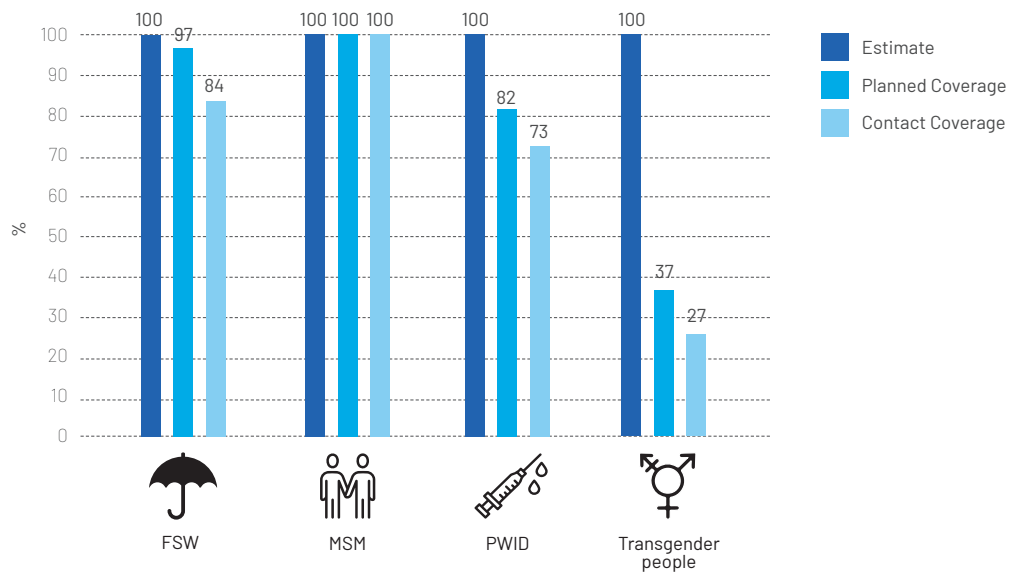

Figure 8: KP prevention programme coverage

Note: For the MSM, the planned and contact coverage were 160% and 126% of the estimate, respectively, hence capped at 100%

HIV Epidemic Appraisal in Kenya

On average, there is high coverage of KPs in Kenya. However, there are variations in programme coverage across counties. The analysis shows that most counties with concentrated epidemics do not have interventions for KPs. It is important to reach KPs with effective and focused HIV prevention programmes to manage concentrated epidemics. Hence, reducing disparity in the coverage of KPs across counties should be prioritised. Both mobilisation of resources to scale up planned coverage and identifying reasons for the gaps in contact coverage are critical for effective HIV prevention programming among key populations in the country.
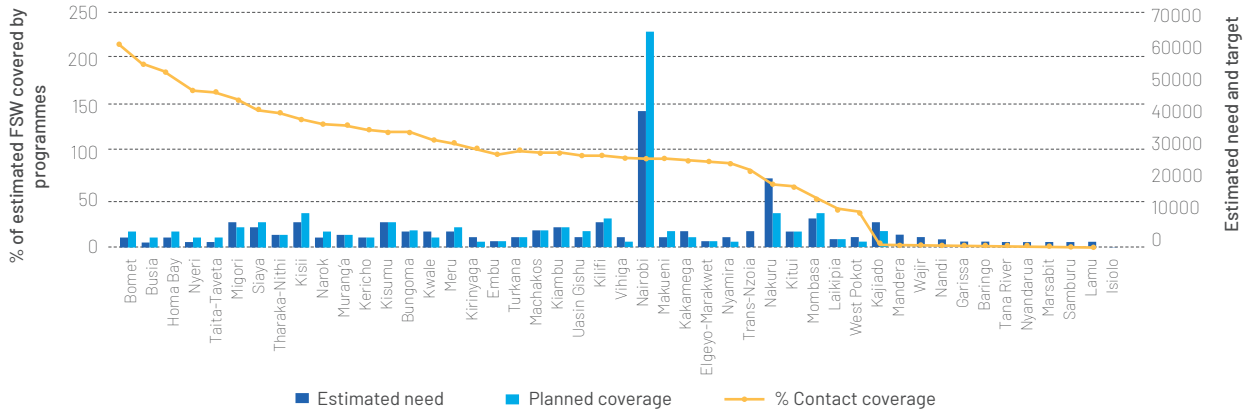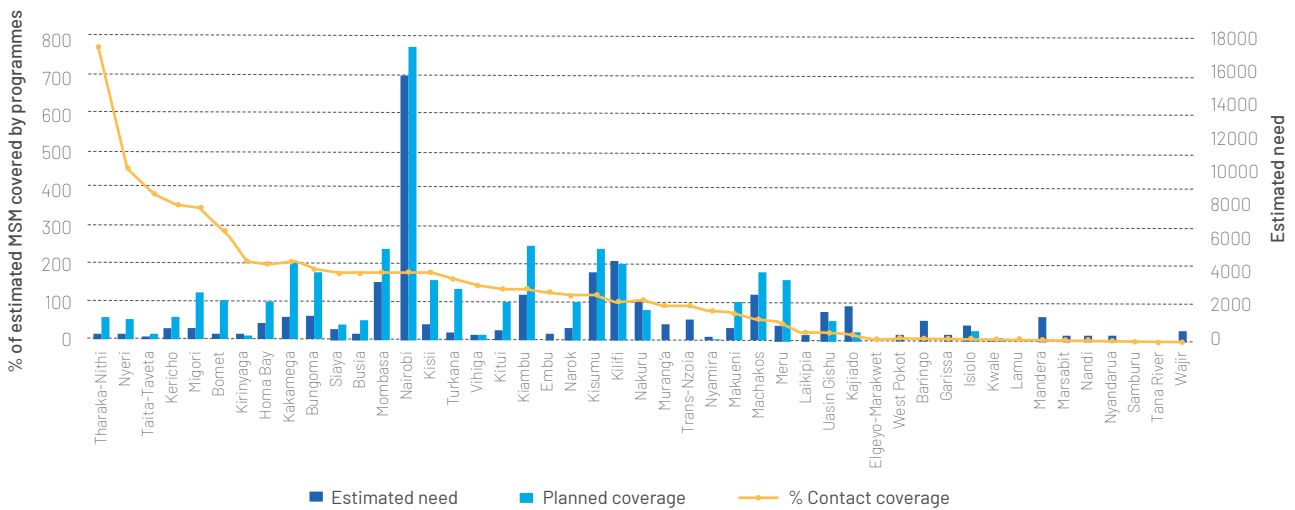

Figure 9: FSW prevention programme coverage
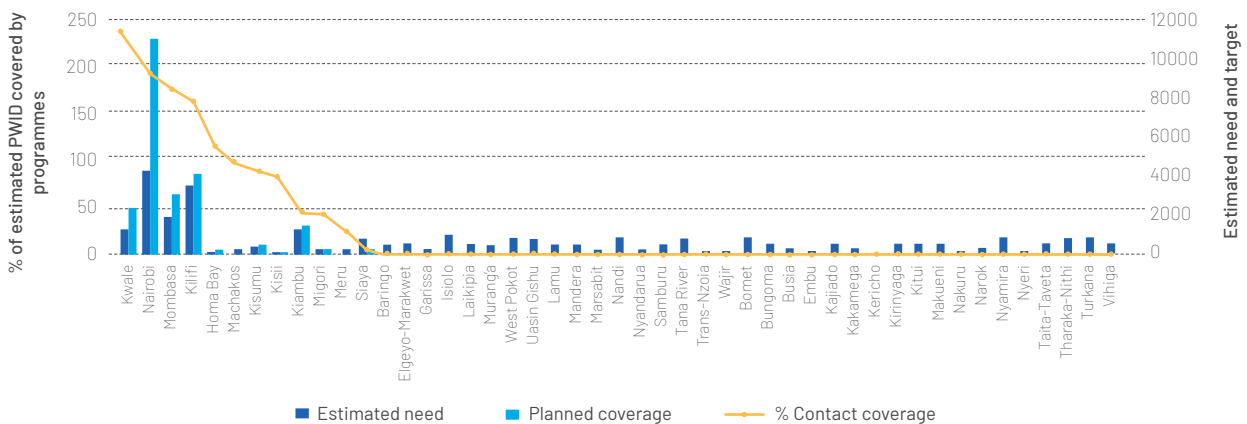

Figure 10: MSM prevention programmme coverage

Figure 11: PWID prevention programme coverage

B.3.3. AGYW programme: Available resources inadequate to cover the AGYW in need of interventions

Overall, the country has a planned coverage of only 27% of estimated AGYW in need. The contact coverage is at 22% showing a huge gap in both planned and contact coverage of AGYW in the country.

Through there are 26 counties in the country which have generalising and mixed epidemic and warrant programmes for AGYW, only nine counties have resources for programming. Even in these nine counties, the coverage of AGYW with HIV prevention programmes is very low.

Kisumu, Nairobi, Homa Bay, and Mombasa are high-priority counties for HIV prevention but had relatively lower contact coverage for AGYW. Kakamega and Uasin Gishu are counties with a mixed epidemic and a high priority for HIV prevention programmes but did not have an AGYW programme.
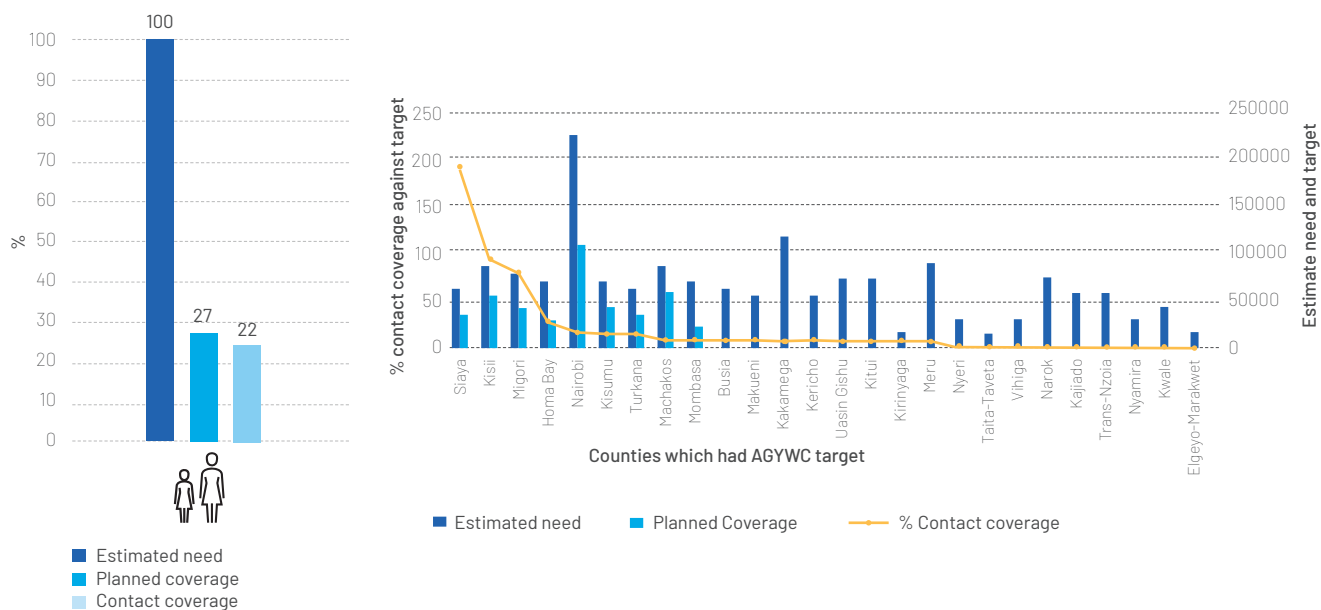

Figure 12: AGYW programme coverage

B.3.4. VMMC programme: Coverage of eligible men remained low across the country

The VMMC programme focuses on 13 priority counties. These include five culturally non-circumcising counties, Turkana, Kisumu, Migori, Siaya, and Homa Bay, and eight culturally circumcising counties with non-circumcising subgroups, Mombasa, Nairobi, Marsabit, Busia, West Pokot, Nandi, Nakuru, Kericho. Twelve out of 13 priority counties had VMMC programmes. Although they had funding to extend VMMC services to 35% of the uncircumcised men and boys in these counties, the programmes reached only 6% of the men.

VMMC coverage was higher in counties with relatively fewer targets. For instance, in Siaya, Migori, and Kisii counties, the planned coverage was about a quarter of the country's target, i.e., around 40,000 to 50,000 men. However, the programme reached more than 100% of the planned coverage. In contrast, in Kiambu, Mombasa, Machakos, Kilifi, and West Pokot counties that accounted for 37% of the national target, the VMMC services coverage remained less than 20%.
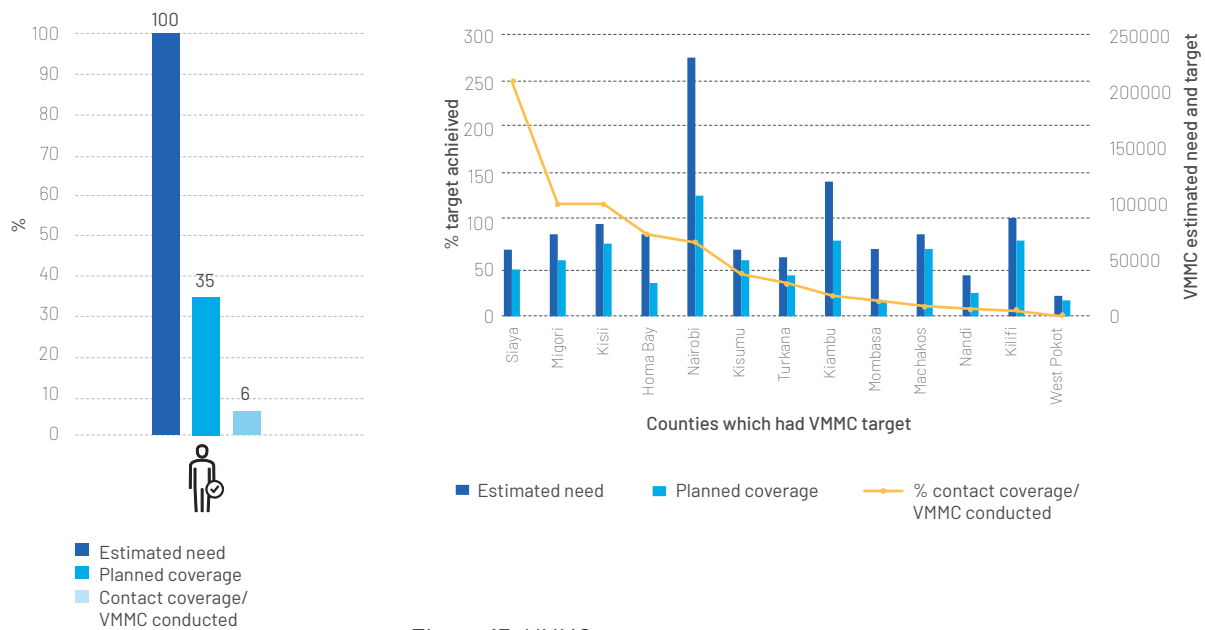
Figure 13: VMMC programme coverage

The COVID-19 outbreak may have also contributed to this low achievement as VMMC is a surgical service. In 2020, the Ministry of Health restricted non-essential surgical services during the pandemic, thereby impacting VMMC targets. However, the analysis also shows that resources are not adequate to cover the estimated need for VMMC services.

B.3.5. PrEP initiation rates better among KPs than general population

Analysis of programme data for PrEP initiation among FSW, AGYW, MSM, PWID, and discordant couples showed low PrEP coverage among all groups. The lowest coverage was recorded among discordant couples and PWID at just 5%. Although PrEP initiation rates were better among KPs - FSW (20%), MSM (13%) - gaps persist in coverage.

How can epidemic appraisals help?

A regular epidemic appraisal is helpful for planning and allocation of resources for more effective HIV prevention interventions and programmes. Epidemic appraisals can help ensure that county-wise resource allocation is proportionate to the disease burden. An assessment of epidemic typology helps in determining the population focus for prevention. Regular analysis of coverage gaps, using different prevention technologies amongst various population groups, can help develop strategies for improving coverage.

How often should we conduct epidemic analysis?

The full epidemic appraisal, including all three components - disease burden, epidemic typology, and programme gaps - should ideally be done once every three to five years, coinciding with the country-level strategic plan period. However, it is helpful to conduct the programme gap assessment more frequently, i.e., once, or twice a year within the strategic plan period.

Implications for HIV Prevention Programmes in Kenya

- Eleven counties – Kisumu, Nairobi, Siaya, Homabay, Migori, Nakuru, Mombasa, Kisii, Kakamega, Kiambu, and Usain Gishu – emerge as priority counties in Kenya for intensive and comprehensive HIV prevention programmes.

- The epidemic typology of the county should determine the populations for focused interventions in the county.

  - Counties with concentrated epidemics should prioritise saturation of the focused prevention programmes among the key populations and pregnant women.

  - Counties with generalising epidemics should prioritise effective programmes for changing the sexual behaviour patterns in the general population. In particular, the focus should be on reducing multiple and concurrent partnerships and increasing the uptake of other prevention measures, such as male circumcision, etc. In addition to KPs and pregnant women, the focus should also be on AGYW, high-risk men, fisherfolk, and other risk networks based on evidence.

  - Counties with mixed epidemics should prioritise saturating prevention programmes for the KPs, pregnant women, and AGYW.

- The country should address the specific gaps in prevention programmes on priority.

  - The PMTCT programme should address the gap of HIV testing to achieve higher coverage of pregnant women in the PMTCT programme. The gap in HIV testing could also be because of low ANC coverage. Hence, a partnership with the Kenya Division of Reproductive Health would be critical to increase the coverage of pregnant women in ANC and through HIV testing.

  - Kenya should prioritise the coverage of PWID and transgender people amongst key populations and scale up the programme for all KPs to cover counties with a concentrated epidemic.

  - Low resource allocation for coverage of the AGYW population creates a vast planned coverage gap. Even in counties where resources are available, there is a big gap in contact coverage. This points towards the need to prioritise scaling-up and saturating at-risk and vulnerable AGYW with effective prevention programmes.

  - Country HIV programme should allocate more resources to the VMMC programme to reach all uncircumcised men. It should prioritise counties like Nairobi for reaching out to men at high risk eligible for receiving VMMC services.

  - Overall, the PrEP coverage is low, signifying a need for the programme to focus on aggressive targeting and demand creation for PrEP.

The epidemic appraisal methodology and findings highlight advancing HIV prevention strategies by focusing on how interventions can be prioritized and tailored for specific contexts, based on epidemic typology. This approach can accelerate progress in HIV prevention through improving the effectiveness and efficiency of the mix of interventions, and identifying key gaps in the effective coverage of important interventions in the focus populations. In addition, this approach can provide more clarity about how to monitor progress in intervention implementation, based on epidemic typology and population needs.

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