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Understanding HIV Prevalence among Teenagers in Western Kenya: Risk Factors, Challenges, and Intervention Strategies

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ABSTRACT

Sub-Saharan Africa remains the epicentre of the global HIV epidemic, with the region accounting for 67% of the 39 million HIV-positive individuals worldwide in 2021. Kenya ranks among the top fifteen countries with the highest HIV prevalence, with approximately 3.7% of adults aged 15 to 49 affected. The prevalence among women is notably double that of men. This review focuses on the HIV prevalence among teenagers in Western Kenya, examining the sociocultural, economic, and environmental factors that contribute to HIV transmission in this demographic. It analyses current data on prevalence rates, risk behaviours, and the uptake of HIV testing and treatment among teenagers in the region. Additionally, the narrative review identifies key challenges in addressing HIV in this group and evaluates effective intervention strategies. By highlighting gaps in knowledge and synthesizing existing research, this review aims to guide targeted public health initiatives to reduce HIV incidence and improve outcomes for teenagers in Western Kenya.

BACKGROUND

Human immunodeficiency virus/Acquired Immunodeficiency Syndrome (HIV/AIDS) is a worldwide pandemic [1]. The World Health Organisation (WHO) estimated that 39.0 million people [33.1–45.7 million] worldwide were living with HIV by the end of 2022, with approximately 0.8% being between 15–49 years although the impact of the epidemic varies greatly between countries and regions [2]–[4].

Sub-Saharan Africa has been most severely affected by the global HIV epidemic. According to estimates, Sub-Saharan Africa accounted for 67% of the 39 million HIV-positive individuals globally in 2021 [5], [6]. Kenya is one of the top fifteen countries globally with the highest HIV prevalence, affecting about 3.7% of adults aged 15 to 49. Notably, the prevalence rate among women is double that of men [7], [8]. The HIV epidemic in Kenya is varied, affecting different people and geographical areas in different ways. Key and priority groups, including adolescent girls and young women, female sex workers, and men who have sex with men (MSM), account for about 30% of newly diagnosed HIV cases. Despite making up a small portion of the population overall, these key population groups are more likely to contract HIV because of things like discrimination, mental health issues, social marginalisation, and restricted access to healthcare services [9]. In Kenya, adolescents are more likely to contract HIV. In 2020, there were approximately 14,410 new infections among teenagers aged 15 to 24 years, accounting for 41% of all new infections among adults, while adolescents aged 10-19 years old represented 91,634 (8%) of the total number of people living with HIV [10].

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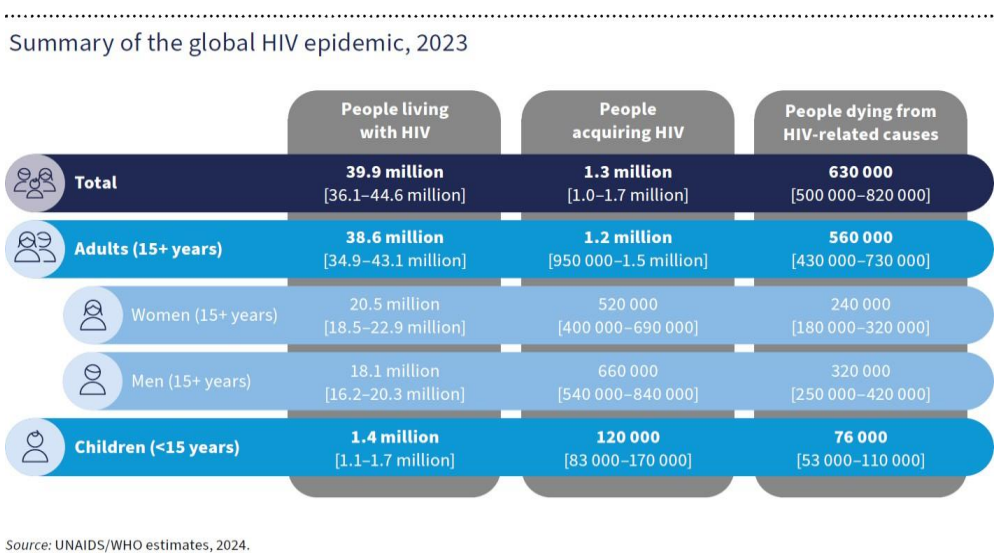

Figure 1: Global HIV Epidemic (2023): Since the start of the epidemic, 88.4 million [71.3–112.8 million] people have been infected, and 42.3 million [35.7–51.1 million] have died. As of 2023, 39.9 million [36.1–44.6 million] people were living with HIV, with the highest burden in the WHO African Region, where 3.4% of adults are affected, accounting for over two-thirds of global cases.

Globally, numerous interventions and programs are being implemented to end the HIV/AIDS pandemic [11]. For instance, the United Nations Political Declaration on HIV/AIDS (2016) established a global goal to end the AIDS pandemic and combat HIV by the year 2030. The UNAIDS Programme aims to diagnose 95% of individuals living with HIV by 2030, ensure that 95% of those identified are receiving treatment, and achieve viral suppression in 95% of those receiving treatment. However, according to Frank *et al.*, (2019), most countries are likely to miss the 2030 global target largely due to gaps in HIV testing and treatment [13], [14].

Kenya has a nationwide programme specifically designed to spearhead HIV response among the nation's important groups [15]. As a result, there has been a significant decrease in the number of new HIV diagnoses. However, not all parts of the nation have reaped these benefits equally. For instance, the prevalence of HIV is almost three times higher in some counties in Western Kenya than it is nationwide [16], [17]. This narrative review aims to explore the epidemiology of HIV among teenagers in the western region of Kenya, examining the prevalence, risk factors, and the socio-economic and cultural factors contributing to the epidemic.

Epidemiology of HIV Among Teenagers in Western region in Kenya

Kenya's Western region has long been one of areas with the highest prevalence of the most HIV/AIDS. According to recent data, the prevalence rate among youths between the ages of 15 and 19 is almost 3.7%, which is greater than the 2.1% national average for the same age group. Kenya's Western region has long been one of areas with the highest prevalence of the most HIV/AIDS. According to recent data, the prevalence rate among youths between the ages of 15 and 19 is almost 3.7%, which is greater than the 2.1% national average for the same age group [16]–[18]. Nyanza Province in western Kenya maintains the country's highest HIV prevalence rate at 15.0%, with 17.6% among women and 11.4% among men [19], [20]. Gender, socioeconomic level, and educational background are among the factors that influence HIV infection among teenagers in Western Kenya. Young women between the ages of 15 and 19 have a higher prevalence rate than their male counterparts. Cultural practices, early marriage, and gender-based violence contribute to this imbalance [10]. Furthermore, adolescents from lower socioeconomic backgrounds have greater prevalence rates because they have less access to resources for schooling and healthcare. Participants in school programmes exhibit lower prevalence rates than non-participants, suggesting that school attendance has a protective impact [10].

There is a disparity in the prevalence of HIV among youths in the Western area. Prevalence rates are greater in urban areas like Kisumu and Kakamega than in rural ones. Higher population densities, greater mobility, and riskier behaviours that are more common in urban environments are all associated with this urban-rural split [21], [22].

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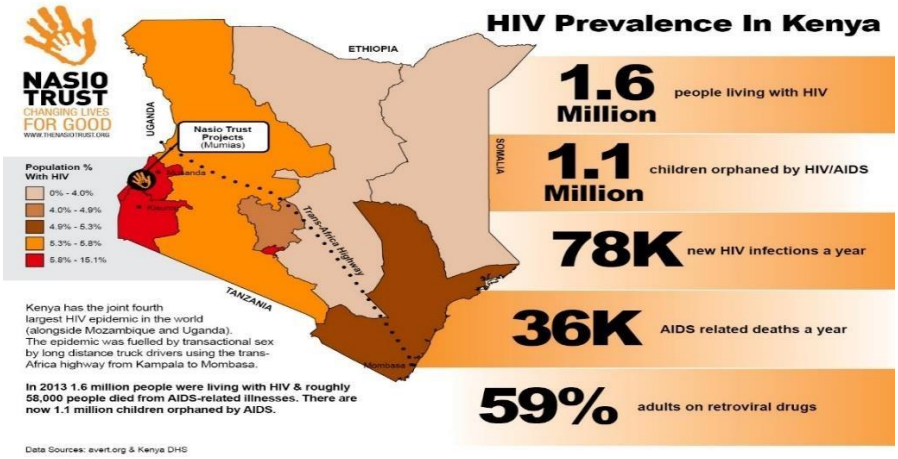

Figure 2: HIV Epidemic in Western Kenya: The infographic highlights the significant impact of the HIV epidemic in Western Kenya, influenced by the broader crisis across Africa. It also illustrates the background contributing to over 1.6 million people living with HIV in Kenya [23].

Risk factors contributing to spread of HIV/AIDS

Sociocultural and Economic Factors

A major factor in the spread of HIV is cultural norms and attitudes around sex and the virus. Sociocultural factors have an impact on attitudes, behaviours, and knowledge that raise the risk of HIV infection and increase susceptibility.

Traditional Gender Roles

Traditional gender norms influence sexual behaviour and decision-making in many sections of Western Kenya. In sexual interactions, men are frequently expected to demonstrate their power and authority, which might encourage dangerous sexual behaviours like having several partners and refusing to use condoms. On the other hand, because of social norms that demand devotion and submissiveness, women may not have as much ability to negotiate safer sexual practices[24].

Widow inheritance and sexual cleansing rituals

Widow inheritance and levirate marriage, typically by a deceased husband's brother, support widows and orphans in certain communities on both a social and financial level [25]. The deceased's family might also want to keep control of the widow, the dowry, and whatever assets the deceased accumulated [25]. Because widow inheritance promotes the development of broad sexual networks, it has been linked to the spread of HIV/AIDS.

In other contexts, engaging in intimate physical contact with a widow is encouraged through rituals of sexual cleaning, whereby intimate physical contact is believed to drive away the ghost of the departed and avert calamity for the living. In certain instances, such as with the Luo people in Kenya, the ceremony may be carried out by a hired cleanser for payment. These cleaners have intercourse without protection with several partners, sometimes even on the same night if they are cleaning the widows of a polygamous man [26].

Poverty

According to recent studies, poverty has a major role in the HIV/AIDS pandemic in sub-Saharan Africa. The assumed relationship is that people in poverty are compelled to look for sexual relationships that give them material or financial support. As a result, their capacity to insist on safe practices—like routinely wearing condoms—is diminished, which raises their risk of infection [27][28], [29].

Sexual behaviours that enhance the risk of contracting HIV have been linked to poverty-related factors such debt, unemployment, income, and food insecurity, as well as a lack of financial assistance [30][31]. These

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behaviours include having several sexual partners, inconsistent condom use, unprotected sex, and transactional sex [32].

High rates of poverty in many African nations, including Kenya, lead to some young women having transactional sex with older men in order to pay for personal necessities like sanitary napkins, cosmetics, and school supplies like books and uniforms. As such, these young girls frequently engage in sexual behaviours out of necessity rather than choice and have little self-advocacy or negotiation skills. They are especially susceptible to HIV infection because of their lack of negotiating strength and expertise [32].

Sexual Behaviour and Risk Factors

Early sexual debut, or having sex before the age of fifteen, is associated with serious dangers to a young person's sexual and reproductive health [33]. It is noteworthy as a risk factor for HIV and STIs because young people who go through early coitarche are more likely to participate in hazardous sexual behaviours, such as unprotected sex and having several high-risk partners. Early sexual experience is strongly correlated with an increased risk of HIV infection in sub-Saharan Africa [34]–[37]. Kenya Demographic and Health Survey (KDHS) data indicates that young men (15–24 years old) are almost twice as likely as young women (21% versus 12%) to have had sex before the age of 15 [38]–[41]. Moreover, biological variables and power disparities based on gender make women more susceptible to HIV [42]. Omanga *et al.*, (2023), reports that in Homa-bay County, Kenya, young people engage in early sexual activity for several reasons. They fear being labelled as "odd" by their peers and believe in the notion that "practice makes perfect" for both genders[43]. Other factors include curiosity about sex, media influence, the pressure on males to prove their fertility, the belief that sex signifies love (leading some youths to coerce their partners into early sexual activity), and the conviction that sex is a human right and should not be subject to parental or guardian interference [44].

Multiple partnerships are associated with an increased risk of HIV and STIs [45]. According to [39], men in Kenya are about nine times more likely than women to be involved in many sexual relationships. 9.6% of male adolescents in the 15–24 age group reported having more than two partners while 1.5% of female teenagers in the same age range had more than two sexual partners. These figures highlight the critical need to address youth unsafe sexual behaviour in Kenya [46]–[48].

HIV Testing and Treatment Uptake

HIV testing is essential for treatment and prevention. Patients who are aware of their HIV status can begin antiretroviral medication (ART), which lowers the viral load. According to recent study, people with undetectable viral levels are not likely to spread HIV to other people [49]. Therefore, it is beneficial to stop the virus's spread and to identify HIV cases through testing and to make sure that newly diagnosed patients receive and continue treatment.

According to the Kenya HIV Testing Services Guidelines from the National AIDS and Sexually Transmitted Infections (STI) Control Programme all medical facilities should provide HIV testing and counselling to adults and adolescents 15 years of age and older If a child, at the age of 14, has been exposed to high-risk conditions or lives in an area where HIV infection is prevalent, they should be tested [50]. Despite these guidelines, recent estimates show that only 46% of women and 53% of men in Kenya have been tested for HIV, highlighting the need to better understand the factors that facilitate or hinder HIV testing [21], [22].

The barriers to HIV testing among youth in Kenya include:

Stigma and Discrimination

One of the main obstacles to HIV testing among young people is the widespread discrimination and stigma around HIV/AIDS. Studies have indicated that many young individuals are discouraged from obtaining testing services because they fear being classified as HIV-positive. According to a study by Nall *et al.*, (2019) , young people refuse HIV testing out of fear of social rejection and bad perceptions from classmates and community members. The cultural and societal beliefs that see HIV/AIDS as the consequence of moral faults or promiscuity

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are frequently the source of this stigma [51]–[53].

Lack of confidentiality

Youth access to HIV testing is significantly hampered by worries about confidentiality. Many young people worry that if they are tested for HIV in neighbourhood health centres, their status would not be kept confidential. Young people are more concerned that medical professionals may reveal their test findings to the community or family, which could have negative social and familial effects [54]–[57]**.**

Challenges in HIV Prevention and Care

Limited access to comprehensive sexual education

Despite the numerous interventions aimed at controlling HIV in Western Kenya, favourable conditions persist and have the potential to hinder prevention, testing and treatment. These are sociocultural, structural, and legal barriers that shape the success of HIV interventions, especially among adolescents. This knowledge is crucial in the creation of enhanced policies necessary to fighting the HIV menace in this region [58].

Limited Access to Comprehensive Sexual Education

Comprehensive sexual education is still very limited, and this has proved to be one of the major problems in HIV prevention in Western Kenya. CSE is teachings method by which students keep attending school and are educated on age-appropriate, culturally sensitive, and scientific information on sex, sexuality, relationships, and reproduction [59]. In particular, CSE should help young people make the right choices on matters such as HIV and other STIs to ensure they are protected.

Sex education is not well taught in Kenyan schools, as most schools only teach about abstinence, and other alternative forms of education are rarely given prominence. This limited approach does not prepare adolescents with the adequate knowledge and skills required to handle aspects of sexual relationship jealousy [60]–[62]. Several studies have pointed out the importance of CSE in the prevention of risky sexual behaviours among youngsters. However, a recent survey by Muthoni (2016) revealed that many Kenyan youths claimed to have limited or no sexual education in school [60]–[62]. This gap in CSE is worrisome, especially given the high trending HIV among teenage Youths in Western Kenya. Most teenagers lack the knowledge which will enable them to avoid getting infected with HIV by exercising their right to education. For instance, a cross-sectional study carried out in the area revealed that the majority of the youths had poor knowledge of the proper use of condoms, which is among the most efficient ways of preventing HIV transmission [63]–[65]. On the same note, misconceptions and myths about HIV continue to exist in the adolescent population, thus making the already hard work of preventing HIV even harder.

There is also cultural taboo since people are restricted from discussing issues about sex and sexuality, which still affects the delivery of CSE. Many people, especially within the developing world, find it rather awkward to discuss sex, let alone with the youths freely [60]. This cultural resistance makes it difficult to put in place sound education programs on sexual issues in schools and society. Furthermore, parents and guardians themselves may avoid teaching sexual health to their children, so most adolescents turn to friends or the internet for information that may be either misleading or partial [66], [67].

To overcome these issues, there is a need to improve the integration of CSE into the schooling system in Kenya. These have to entail raising awareness of teachers who can teach CSE appropriately and the cultural sensitization of the content to be taught, as well as the parents and community [67], [68]. Furthermore, it should also emphasize the need to transform cultures that deny young people a chance to freely talk about their sexual health since this is a way of empowering them to get information on how they could protect themselves from getting HIV [69].

Health System Barriers and Gaps in Service Delivery

HIV prevention, testing, and treatment initiatives in Western Kenya are also limited by the health system's

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deficiencies and implementation disparities. Over the years, Kenya has expanded its health system, but several barriers affect HIV service provision, especially for adolescents [70]–[72].

a) **Inadequate Health Infrastructure:** In many parts of Western Kenya, there are limited health facilities, and those that are available are not well equipped to meet the needs of HIV patients. This is especially the case in rural settings where healthcare centres have limited healthcare needs and no adequate medical equipment and drugs required in the management of HIV. For instance, it is reported that the supplies of ART, HIV testing kits or even the essential medical essentials are not adequately available or sometimes entirely unavailable in many health centres [16], [17]. The dilemma of a scarce resource is worse because many people have to travel a long distance to reach the nearest health facility, and due to these exerting forces, many do not attend these facilities regularly and never come back for follow-up, including adolescent persons [71], [73].

b) **Limited Access to Youth-Friendly Services:** Adolescents and young adults often face unique barriers when accessing HIV services. Many healthcare facilities in Western Kenya must be equipped to provide youth-friendly services, essential for encouraging young people to seek care. Youth-friendly services are accessible, acceptable, and appropriate for young people, considering their needs and concerns [70]. However, in many cases, healthcare workers lack training in adolescent health, leading to environments that are unwelcoming or even hostile to young people [74]. This lack of youth-friendly services can deter adolescents from seeking HIV testing and treatment, as they may feel judged or misunderstood by healthcare providers.

c) **Insufficient Healthcare Personnel:** Several challenges make adolescents and young adults particularly vulnerable to HIV and make it difficult for them to access these services. Many health facilities in Western Kenya have no youth-friendly services, which are crucial tools for getting young people to enjoy health facility services. Youth-friendly service delivery can be accessed, utilized, and appealed to by youths with due consideration for their needs and concerns [74][74]. Still, in many healthcare institutions, the staff is not informed enough about adolescent health, making environments inadaptable or even hostile to the youth [74]. This makes youth shy away from HIV testing, diagnosis, and treatment since they can be discriminated against or judged by the officers offering these services.

In order to overcome these health system barriers, one has to invest significantly in enhancing healthcare structures in Western Kenya. This comprises having all health facilities well stocked with all the needed equipment as well as drugs and advancement in health through the provision of health facilities in rural areas [73]–[75]. There is also a need for training of facilities and personnel. Through this, they can offer friendly services to young people. Therefore, efforts can be made to ensure that health facilities are young-friendly to enhance the uptake of HIV testing and treatment services by adolescent persons.

Legal and Policy Constraints

Legal and policy hurdles also limit HIV prevention and care among teenagers in Western Kenya. These restraints can hinder service availability and foster a climate within young individuals who avoid or refrain from seeking care.

Restrictions on Access to Contraceptives for Minors: In the case of Kenya, the provision of contraceptives for minors is still a subject of debate. There are existing laws and policies that prevent the use of contraceptives by those who are below the age of 18 years, yet many students engage in sexual activities [76][77]. These curtailments stem from social and cultural beliefs that associate contraception and teenage pregnancy prevention with the endorsement of sex. However, this argument does not take into account the fact that many adolescents are already at risk of HIV and other STIs, and it is therefore important to provide them with contraceptives to prevent these.

Poor access leads not only to the acquisition of HIV/ AIDS but also to high adolescent unplanned pregnancies. This is more so for young people, who are more likely to be stigmatized by health facilities and or society when looking for contraceptive services [78], [79]. Consequently, most adolescents participate in unprotected sexual

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activities, thus increasing their likelihood of developing HIV.

Criminalization of Certain Sexual Behaviours: The law in Kenya also bans certain sexual practices that are discriminatory to key populations more affected by HIV, including same-sex practising and sex workers. Lesbian, gay, bisexual, trans, queer, or intersex or those engaging in transactional sex may not seek HIV testing and treatment because of the possibility of legal actions against them or discrimination (Human et al., 2019). Besides the marginalization of such groups, this criminalization pushes away vulnerable populations from accessing HIV treatment and care.

Barriers to Comprehensive Sexual Education: Legal and policy factors are another factor that influence the provision of comprehensive sex education. Policies that incorporate only sexual abstinence slow down schools from providing CSE inclusive of contraception and safe sex [80]. This limited education hinders young people's ability to protect themselves against HIV and continues to spread the virus to adolescents.

Due to these legal and policy restrictions, what is required is a reform mechanism that fits the current teenage sex practice and the need to prevent HIV/AIDS. This also involves changing the legislation to permit easier access to birth control to minors and penalizing behaviours that raise HIV risk, as well as ensuring that the policies of sex education inform the public with accurate data [81], [82]. Such reforms would enhance overall HIV prevention and care, hence relieving the burden of HIV prevalence among teenagers in western Kenya.

Intervention Strategies

To effectively tackle HIV prevention and care in Western Kenya, cultural, structural and legal HIV prevention and care in Western Kenya challenges mentioned earlier have to be considered in their totality. However, successful intervention strategies must be extensive, easily accessible, carried out in communities, and part of large-scale health efforts. The following are the approaches that may go a long way to reduce the prevalence of HIV among adolescents as well as enhance the treatment of those living with HIV ailment [83]–[85].

a) **Comprehensive Sexual and Reproductive Health Education Programs**

   Compulsory and accurate Sexuality education is an important foundation of HIV prevention measures. Unlike previous Sexual Education, where most concentration was on an abstinence-only approach, CSE empowers youths with the factual knowledge, skills and values to enable them to make the best choices when it comes to their sexual and reproductive lives [86], [87]. The domains covered are humans, relationships, individual skills, sexuality, sexual health, and society and culture.

b) **Culturally Relevant and Age-Appropriate Education:** To be effective, the CSE provided in the schools of the Western Kenya region must be culturally appropriate and developmentally appropriate. This implies that the content should reflect only the needs and situations of the adolescent population in the region. For example, educational programs that seek to address youthful sexual behaviours should embrace the cultural beliefs concerning sexuality and marriage, among others, as espoused by Muthoni (2016). Additionally, CSE should be taught from primary school to make sure that young people get the information before they engage in any sexual activity [61], [88], [89].

c) **Involvement of Parents and Community Leaders:** To address cultural barriers and improve the outcomes of CSE, parents, guardians, and community heads need to be engaged in the development and implementation of the programs. This engagement can help others regard CSE as helpful in the give-and-take of adolescence and not as something that promotes sexual permissiveness [90], [91]. It also ensures that such stakeholders are engaged in the discussion to enhance trust and encourage people to discuss matters concerning sexual and reproductive health freely.

d) **Use of Innovative and Interactive Methods:** CSE programs should engage adolescents through active and exciting teaching techniques. These can include technology, peer discussions, role-play, and the incorporation of multimedia resources in learning. Such approaches are essential because they enhance learning because young people relate to real-life examples. For instance, there is effectiveness in using

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mobile apps and online platforms to share information and support where a person's comfort may not be attained to pursue such topics in person [92], [93].

e) **Youth-Friendly HIV Testing and Counselling Services;** Adolescents in western Kenya experience specific barriers in adhering to HIV testing and counselling services. In order to overcome these barriers, one must develop services that are easily accessible to youth, as well as confidential services and services that are more responsive to youth's requirements.

i. **Accessibility and Convenience:** To be considered youth-friendly, setting out of the services must be easily accessible to young people in terms of area and time. This may involve opening up until the evening. The weekends, as most youths, are often available during the evenings and over the weekend, and services are located in places that the youths can easily access. Also, mobile clinics and outreach services can target adolescents, especially if they are situated in hard-to-reach regions with limited health centres [94].

ii. **Confidentiality and Non-Judgmental Care:** Stigma and judgment are some of the issues that adolescents particularly consider when they decide on HIV testing and counselling. Regarding this, health caregivers must be trained to understand young people sympathetically and avail themselves of their services discreetly. This includes the physical layout of the healthcare facility to ensure patient privacy and how staff treats adolescents [95], [96].

iii. **Involvement of Peers in Service Delivery**: Peer involvement is another aspect of youth-friendly HIV service delivery systems. Friends with similar experiences and related concerns can easily tell the adolescent to open up and trust them. However, reaching out to young people and enrolling them as peer educators and counsellors to carry out HIV testing, counselling, and support can fill this gap. They found that peer-led intervention does enhance the utilization of HIV testing and counselling services among adolescents [97].

iv. **Community-Based Outreach and Peer Support Initiatives;** Community intervention programs and the involvement of peers are particularly important for addressing adolescents as these often cannot attend healthcare facilities and are afraid of the stigma [79], [94], [98], [99]. These can be instrumental in HIV prevention, testing as well as care, especially within the rural and hard-to-reach areas of western Kenya.

Engagement of Local Leaders and Influencers: Community-based interventions should engage the community development organizations, opinion leaders, and other key decision-makers in the community. Such individuals can potentially change the culture toward HIV and its treatment among the youth, hence removing the stigma among the youth. For instance, when the chiefs and other religious leaders support the use of condoms and testing for HIV, then society is likely to accept the messages [98]–[101].

Use of Peer Educators and Community Health Workers: Peer educators and CHWs are important team members when rendering outreach services, especially in rural regions. CHWs is usually comprised of trusted community members who can offer information, support and referrals to youths in a culturally competent manner [102]–[104]. It can also reach out to adolescents through home visits, community meetings, and other strategies to discretely communicate vital HIV information to adolescents [16], [105]–[107].

Integration of Technology in Outreach Efforts: Technology is especially useful when participating in community-based outreach programs. Many mobile phone and social networking sites for adolescents can help provide information and support and link them to health facilities. For example, texting can be applied to daily prompts to perform HIV testing among young people. As for the online sources of information, they can address adolescents with HIV who need to find support in their experiences or get emotional support from like-minded people, for instance, in online communities [108]–[110].

Integration of HIV Services into Existing Adolescent Health Programs

Another indication of enhanced HIV prevention and support in Western Kenya is the incorporation of HIV

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services into available adolescent health programs. The inclusion of HIV services into other interventions that touch and cater for youths also minimizes prejudices and addresses multiple healthcare needs of youths.

Comprehensive Adolescent Health Services: Including HIV into broader strategies for comprehensive health service delivery to adolescents guarantees that youth access multiple health services with one visit. This can involve Family planning, HIV/AIDS and other STIs services, maternal and child health services, and counselling services, among other services such as general medical services [111]. HIV prevention, testing, and treatment are facilitated when they form part of the broader health system, which also assures adolescents an easy time accessing the services of their choice and a normalization effect where HIV treatment becomes just but one aspect of health care.

Task-Shifting and Training of Healthcare Providers: To enhance standards of care for adolescents in healthcare settings where HIV services are integrated, there is a need to train healthcare providers in adolescent health and task-shifting. Task-shifting speaks of relegating some tasks from more highly skilled and trained healthcare professionals to less trained ones, such as community healthcare workers, nurses or midwives. In doing so, this approach can also assist in filling the shortage of healthcare personnel and guarantee that adolescents have access to competent and timely healthcare. For instance, ensuring that nurses carry out HIV testing and counselling during normally scheduled adolescent clinic visits makes the services more available [94], [97].

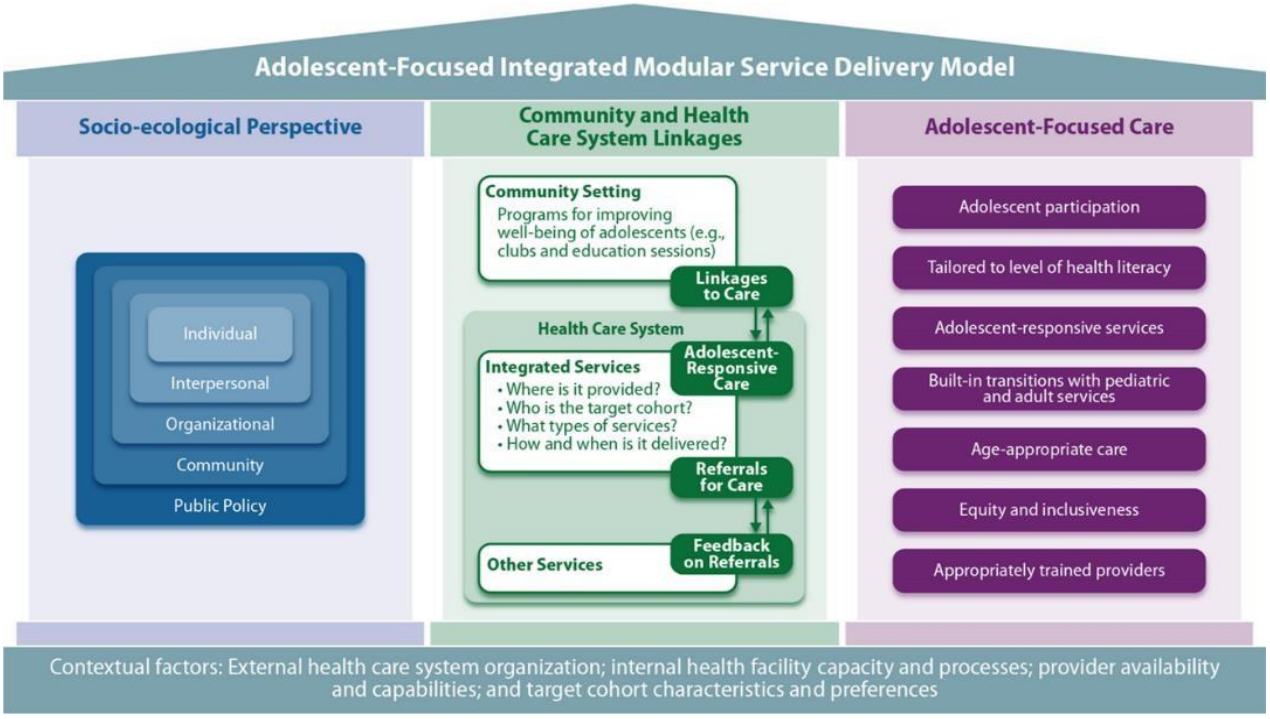

Figure 3; Integrated Health Care Delivery for Adolescents Living with and at Risk of HIV Infection: A Review of Models and Actions for Implementation

Collaboration with Schools and Educational Institutions: School-going adolescents can be easily targeted by various health services through schools and other places of learning. Since schools can provide excellent access to children through signing in, this makes it easier for providers of healthcare to take HIV testing and counselling as well as education to the schools. Other school-based health programs offer interventions, including referrals to local health facilities where children can get more specific care. Moreover, the students get to understand HIV education in school, which buttresses the knowledge imparted and taught in health facilities, making the approach more holistic.

Policy and Advocacy for Integration: Some key findings regarding integration attempts include that supportive policies and advocacy are critical. Part of this involves working for policies that support the mainstreaming of HIV services in adolescent health programs and ensuring that effective implementation of such policies occurs at the community level (Human et al., 2019). It is important to note that partnerships between governments, non-

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governmental organizations and community-based organizations play a key role in initiating such efforts and making the continuum of services available to all adolescents in Western Kenya.

Success Stories and Best Practices

Case Studies of Successful Interventions in Nakuru County

Nakuru County is one of the Counties in Kenya that has received different Health Interventions, especially in the fight against the HIV/AIDS epidemic. As the years passed, several efforts have been made, with numerous positive outcomes achieved that can act as examples for other territories. Nakuru has the Nakuru Youth-Friendly Centre Initiative (NYFCI). This is a sexually reproductive health facility set up and operated by a joint effort of local authorities and international non-profit making organizations [112]. The services provided include HTC to youth and other specific groups.

Most importantly, this centre relies on the youth-oriented model to make them healthy, productive citizens in future. It uses enlightened peer educators to conduct fellow peers' states without prejudice. This has been very useful in breaking the barriers of teenage participation in HIV testing since many of them considered the test to be shameful [112], [113]. The centre also incorporates the use of Information Communication Technology, which includes the use of a short message service reminding the patients to honour their clinic appointments and ensure compliance with their treatment regimen, which has enhanced the well-being of the youths living with HIV/AIDS.

Another effective intervention in Nakuru County is the Community-Led HIV Education and Prevention Program. This program targets the involvement of the communities in the prevention of HIV/ AIDS. This employs what is known as Community Health Workers (CHWs) who are from the community in which they work. The CHWs make home visits, educate residents to prevent HIV contraction, distribute condoms, and recommend where to get HTC [112]. The program has also had the high impact of increasing HIV testing within the areas of high demography of people within the rural set up of Nakuru County and reduction of new HIV cases.

Moreover, the program that has recorded much achievement, the Prevention of Mother-to-Child Transmission (PMTCT) Program in Nakuru, has also been impressive. Pregnant women are routinely screened and tested for HIV, and positive women are placed on ART to reduce the chances of passing the virus to the baby [114]–[116]. As regards the program's performance, the transmission of HIV from mother to child is below 2%, and this has been scaled down from previous years [116]–[118]. Such an outcome can be explained by the fact that the program focuses on the clients' complete assessment, further follow-up, counselling, and support for both the mothers and their partners.

Innovative Approaches to Addressing HIV among Teenagers

Young people, especially teenagers, are a vulnerable group in the HIV/AIDS prevention efforts mainly because of social, economic, and cultural factors. With this in mind, Nakuru County has instituted various structures using unique measures to target this group. Among these is the Digital Health Platforms for Teen HIV Awareness and Support. Knowing that young people are active technology users, Nakuru County has targeted this group of people and has used social networks and applications on their mobile devices to convey information [113]. For instance, the U-Report platform lets them post questions concerning sexual health and get answers from health experts without revealing their identity. Also, it has a regular feature of quizzes and other HIV prevention challenges to educate the teenagers and keep them engaged in a style that they can easily relate to owning to their technologically advanced way of life.

The other one is the School-Based HIV Education Program. These programs are more comprehensive than the standard behavior-modification-based sex education, with elements of role-playing, group discussions, and practical sessions facilitated by specially trained peers. It has proved effective in changing attitudes towards HIV by developing an understanding of the disease, the elimination of cultural beliefs, and actual participation by the students in the prevention regimes [119]. It has also equally been important to involve the HIV-positive

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candidates in these discourses to help reduce stigmatization and increase the levels of empathy from the students' side.

In addition, the Teenage Peer Support Groups strategy has been useful in managing psychosocial issues for positive patients. As youth support groups, they offer HIV-positive youths a platform where to discuss experiences, incidents, setbacks, and achievements. These groups are overseen by therapists who help the participants engage in specific topics like compliance with medication, prejudice and intimacy. Not only does the peer support model increase the positive result of the person's mental health, but it also increases the responsibility of the teenager to follow through with their treatment because they feel comfortable with someone similar to them.

In addition to these approaches, Nakuru County has introduced the "Catch Them Young" Apart from the above types of interventions, Nakuru County has embraced the 'Catch Them Young' Campaign, which targets post-puberty adolescents, especially peer groups. It is a set of activities in which young people are educated on the dangers of HIV and how they can avoid the contraction of the virus or acquire necessary tests [119]. In targeting young people and sexually inactive persons, one can place it in their conscious that they have the knowledge that they will leverage as they grow to become sexually active.

Lessons Learned and Scalability of Interventions

Therefore, the effectiveness of these interventions in Nakuru County is a lesson that can be used to replicate such interventions in other areas. That is why the involvement of communities is one of the important lessons that can be learned from the examples analysed [119], [120]. Methods that involve the community, such as the Community Led HIV Education and Prevention Program, have received better participation and trust. This implies that any more effective intervention should be community-based and that the community should have a say in how such intervention is to be implemented.

The other lesson is about the effectiveness of youth-embedded strategies. This can be evidenced by organized programs like Nakuru Youth-Friendly Centre and ICT in Digital Health, among others, where services are offered in ways that best suit the young people. It has also been proven that youths can be sensitized and empowered on HIV prevention and centre through initiatives that will suit them, especially through the use of ICT and peers.

In light of the PMTCT Program's accomplishment, it is imperative to underscore that care must be integrated and sustained. The program's effectiveness in reducing transmission rates is why much support is still required for both the mother and the partners [117], [119], [120]. Follow-up, counselling, and education are vital in enhancing treatment compliance and improving health outcomes.

Another important consideration is the scalability of these interventions. For example, the Youth-Friendly Centre model could be scaled up in other counties by adopting strategies that fit the contexts of the counties. It is also important to note that strategies such as peer education, social media, and soliciting the support of the public can easily be adapted to suit any given culture and demography. In the same way, the digital health platforms adopted in Nakuru could be expanded to the rest of the country if the necessary investment in infrastructure and capacity is made.

From the scope, the school-based programs and peer support groups also provide viable treatment models. Other school-based HIV education programs could be adopted in Kenyan schools with slight modifications depending on the transmission rates within the region or the culture Supporting cultural values in the region. Peer support groups could be increased by increasing the training of more facilitators and establishing support groups in other regions, particularly in rural areas where there is poor access to HIV care and support.

Lastly, the "Catch Them Young" Campaign could be expanded to become a national campaign, functioning as a preventive intervention that could reach youths all over Kenya. This means that the campaign focused on early education could also be directed towards other aspects of sexual and reproductive health. Utilizing comprehensive sex education for youth health education can be another area of improvement [121].

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FUTURE DIRECTIONS AND RECOMMENDATIONS

Priorities for Research and Data Collection

To contain the spread of HIV/AIDS and enhance outcomes for clients with the virus, priorities for research and information gathering should be established. This focus will also facilitate the identification of appropriate strategies for teaching and learning and the decision-making process.

Enhanced Epidemiological Surveillance

A comprehensive epidemiological surveillance, therefore, becomes essential in getting details of the current status as well as the trends of the HIV epidemic. More effort should be devoted to checking the distribution of HIV in different population groups depending on the geographical, economic and age characteristics. The CDC knows that there is still a necessity for an enhanced surveillance system that evaluates newly infected people and treatment accomplishments [122]–[124]. The monitoring and gathering of data from hard-to-reach groups, including sex workers and drug users, are also crucial in targeting the most vulnerable in society.

Investigating Social Determinants of Health

Research needs to be done to address the effects of social determinants on HIV results. These are poverty, education and stigma, which mainly affect the chances of acquiring HIV and receiving the necessary treatment [122]. Knowledge of these determinants can assist in developing intervention models that encompass not only the biological aspects of HIV but also the social antecedents of health results. Research on how prejudice impacts the utilization of health care could help to determine patterns by which prejudices to testing and treatment may be limited [125], [126].

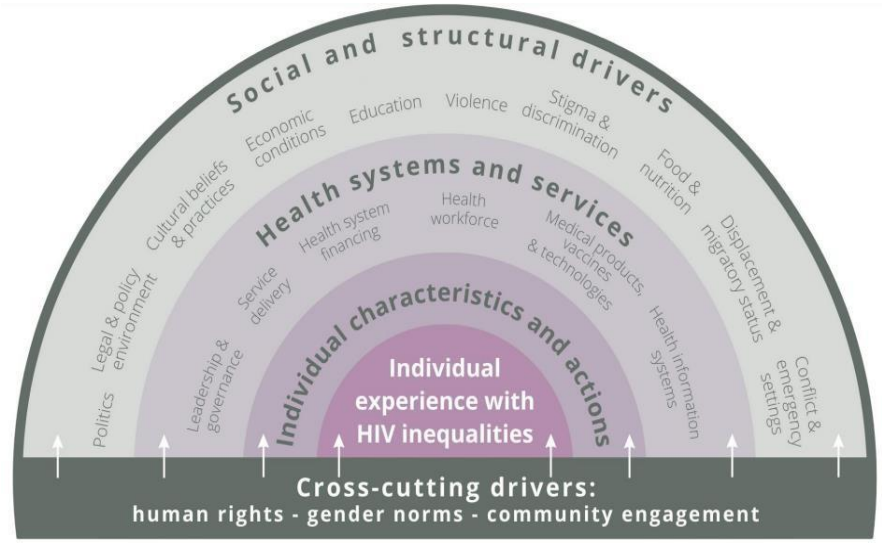

Figure 4; Figure based on: Dahlgren G, Whitehead M. Policies and strategies to promote social equity in health. Stockholm: Institute for Futures Studies; 1991.

Innovations in Treatment and Prevention

Studying the continuous development of new treatment and prevention strategies is crucial. This is through policy advancement to cover better antiretroviral, long-acting formulation and immunization. As reported by the World Health Organization (WHO), there is still a need to develop new strategies and approaches in the treatment of HIV due to the growing concerns about patients' prognosis and risk factors [127]. Biomedical prevention strategies such as PrEP and PEP also need to be researched to help cut down on new infections.

Implementation Science

Research should translate interventions into practice to find the best ways to adopt these interventions in different

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health systems. This comprises an understanding of knowledge relating to service delivery in low–resource ASHR settings and the assessment of the effects of different types of implementation [128]. -measurement of barriers and enablers to implementation can inform further efforts toward implementing effective interventions at scale.

Policy Recommendations to Improve HIV Prevention and Care

To address the HIV epidemic, there is a need to implement sound policies that will enhance the HIV preventive measures as well as the treatment processes. Policymakers should consider the following recommendations

Strengthening Healthcare Infrastructure

It is important to strengthen and develop health facilities to increase the accessibility of HIV services. This is like increasing healthcare facilities' capacity, especially in rural areas, and ensuring they are well-equipped to offer all-rounded HIV Services. They should be concerned with funding for health care services and the number of qualified personnel in the field [129], [130].

Expanding Access to Prevention and Treatment

Laws need to facilitate the availability of HIV prevention commodities, for example, condoms, PrEP and HIV treatment, including ART. According to the Global Fund, such prevention measures should be extended to more participants to decrease transmission rates (Global Fund, 2021). Expanding uptake of health services, including HIV services backed by universal healthcare that has been scaled up in many countries across the globe, can go a long way in enhancing the level of use and, consequently, adherence to such services.

Addressing Stigma and Discrimination

Erasing stigma and discrimination is crucial to motivating people to undergo tests and receive the necessary treatment. They should encourage anti-stigma campaigns and protective measures for persons with HIV in other aspects of their lives and medical facilities. In a study by the UNAIDS, they postulated that when anti-stigma policies are implemented, there is an improvement in the uptake of HIV services, hence the health of the people (UNAIDS, 2020).

Promoting Integration of Services

The combination of HIV services with other related services like SRH services or mental health services is essential in the management of the disease. This approach assists in meeting some of the diverse needs of clients with HIV and AIDS since all aspects of their needs are handled [131]. Policy support should be given for integrated care models, and the models should be properly reinvention.

Enhancing Data Collection and Monitoring

More efforts are required in upscaling and enhancing the health data systems for monitoring and evaluation of HIV and AIDS prevention and treatment programs. Policies should, therefore, enhance the institutional capacity for Data management, increasing the quality of data collected and use of data in policy-making and program development [132], [133].

Strategies for Strengthening Collaboration among Stakeholders

Stakeholders involved have to work hand in hand to ensure that HIV prevention and treatment receive the attention it deserves. The following strategies can enhance cooperation and ensure a coordinated response:

Fostering Multi-Sectoral Partnerships

Strengthening collaborations between governments, NGOs, and private sector organizations can improve the outcomes of HIV programs. Integrated interventions also mobilise different portfolios of expertise and assets,

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distinguished from other epidemic-fighting regimes, thereby enhancing a multi-sectoral response to HIV [131]. The activities should be well-coordinated with the stakeholders' goals and objectives so that they can complement each other and not have to repeat the same work, thus wasting valuable time.

Engaging Community-Based Organizations

Many CBOs are community-based and should be used to reach target groups that are otherwise hard to reach because of the personal touch they bring into the process. To address this, the study has proposed to involve CBOs in carrying out the interventions to address particular cultural barriers in delivering the interventions. This increases the chances of ensuring that community buy-in and participation are also boosted by the involvement of CBOs in the planning and implementation of HIV programs (Khan et al., 2015). The government should appreciate this opportunity to have these organizations and support them materially and with the required policies.

Promoting Public-Private Partnerships

To enhance HIV prevention and care, the newly established PPPs harness the characteristics of both the private and the public sectors. Private entities bring innovations, technologies, and extra funds; the public has the regulation and the guarantee of patient intervention delivery [134]. Successful PPPs are characterized by the clarity of roles and responsibilities, collaboration and regular communication among partners.

Strengthening Coordination Mechanisms

Thus, Stakeholder coordination is a critical factor that requires well-coordinated structures to ensure stakeholders perform their activities harmoniously. This comprises role definition among all the members, scheduled meetings and reporting procedures. The Global Fund management of HIV programs involves establishing national coordinating mechanisms and including all stakeholders as key decision-makers [134]. The advantages of such mechanisms include coordination of efforts, monitoring of progress, and possible solutions to problems.

Building Capacity for Collaborative Efforts

The interconnectivity capacity between stakeholders requires capacity building and development to ensure its increased efficiency. Training, skills development, conducting of workshops, and knowledge-sharing platforms can improve the knowledge of more persons with HIV programs. Creating the enabling environment also entails defining concepts for partnerships, especially for shared and coordinated planning, delivery and assessment of action strategies [134].

CONCLUSION

Summary of Key Findings

In order to effectively address HIV among teenagers in Nakuru County, the following factors should be considered: recent research, lessons learnt, emerging issues, and gaps. The major findings underscore the success, targeted approaches and strategies, new and additional measures, and affordable continuation of HIV prevention among this society group.

Successful Interventions and Best Practices

In Nakuru County, models of successful interventions that have supported targeted strategies for HIV prevention and treatment are available. Several examples point out that peer education and community-based outreach programs have played a key role in the process of enhancing awareness and testing for HIV among teenagers. For instance, including HIV education in the school syllabus and engaging with local facilitators to assist in civic duties have ensured that adolescents receive vital information and services. Further, strategies such as mobile outpatient clinics and online and offline anonymous counselling camps have helped improve HIV prevention services, especially in remote parts of the globe.

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Challenges and Barriers

Nonetheless, some issues continue to raise concerns from time to time. They report that perceived stigma and discrimination continue to hamper the delivery of HIV services to adolescents, preventing them from seeking testing and treatment services. Poverty and low education levels also magnify these aspects since they hinder people's access to these factors and knowledge about them. In addition, the influx creates a dire need to have more extensive information about the current trends and the broader concerns of the teenagers living with HIV in Nakuru County.

Research and Data Collection

It is possible to identify research priorities in chronic diseases that, in particular, point to the need to strengthen epidemiology, study social factors influencing population health, and develop new approaches to treating chronic diseases and preventing their occurrence. Concerns in primary data collection should include the identification of HIV incidence among teenagers, the effects of social factors, and the efficacy of current interventions. The systematic approach to examine the applicability of these proven interventions in actual healthcare settings and the challenges associated with their incorporation is known as Implementation science.

Policy Recommendations

Implementation recommendations emphasize the need to build up healthcare capacities, increase the availability of prevention and treatment, and tackle stigma and Discrimination. Another factor that plays a significant role in increasing the efficiency of AIDS programs is the effective integration of HIV services with other healthcare services and working on the issues related to the collection and analysis of data on AIDS patients. These measures are hoped to contribute towards enabling programs to be adequate and relevant to the needs of teenagers in Nakuru County.

Collaboration among Stakeholders

Stakeholders must work cooperatively to address the problem because an effective solution requires a collective effort. Some successful approaches to health sector cooperation include forming multi-sectoral partnerships, community-based organizations, public-private partnerships and capacity building. Thus, proper coordination measures and appropriate interaction with stakeholders will guarantee that the introduced measures will work efficiently and help the relevant population groups.

Call to Action for Sustained Efforts

Combating HIV in teenagers in Nakuru County calls for continued and coordinated advocacy from key stakeholders. The following call to action outlines the critical steps needed to continue progress and ensure a meaningful impact:

Increase Funding and Resources

HIV prevention and care programs require adequate funding and resources, which are necessary to ensure they are sustained. Governments, donors and International organizations have to ensure the continuity of this funding and create new ones. Potential investments should be directed to strengthening existing health facility systems, linking with community-based organizations onward, and research to fill knowledge and service provision gaps.

Enhance Public Awareness and Education

The ultimate way to avoid HIV/AIDS stigma is by creating awareness among people, particularly through the use of mass media and informative programs. Schools, community organizations, and media organizations should provide relevant and interesting information to teenagers and their families. There should also be a call for the participation of youths in passing their messages and causes in society to be empowered to impact other youths.

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Strengthen Healthcare Systems

Greater attention needs to be paid to creating functional healthcare systems in order to enhance the provision of HIV services. This involves availing skills for practising healthcare providers on ASRH care, increasing the availability of ASRH service delivery places, and making timely essential commodities such as medicine available. Other policies should encourage the elimination of silos to facilitate the delivery of effective HIV services alongside other health services necessary for the youths' well-being.

Foster Community Engagement

Negotiated administration of HIV interventions cannot be overemphasized, and hence, the importance of involving the locals in their development and implementation. Persons from the community and champions of community-based organizations should be engaged in formulating and popularising strategies that are relevant to the community. Relationships with communities will improve because interventions will be accepted and supported; their implementation will become effective because problems will be solved with their help.

Support Innovative Approaches

One of the reasons for striving for fresh ideas and best practices in HIV prevention and management is to discover new methods for better results. Mobile technologies and apps, including digital health platforms, can increase the available services and can help teenagers. Also, expanding more on treatment options and prevention can even improve the potential of HIV programs.

Monitor and Evaluate Progress

HIV programs' progress must be monitored and evaluated periodically to determine their effectiveness and inefficiencies. This implies that focused data collection and analysis should be paramount in capturing results, monitoring achievements and facilitating decision-making. The above evaluations will assist in making sure that interventions are right and fit to address the emerging needs of the teenagers in Nakuru County.

It is important to understand that despite the achievements registered in HIV prevention among teenagers in Nakuru County, more efforts are required to eliminate the current challenges and further advance effective interventions. Through funding, expanding access and availability of education, improving and expanding health systems, engaging communities, promoting innovation, and tracking progress, significant progress can be achieved towards the end of the HIV epidemic and better health and well-being of teenagers in Nakuru County.

Abbreviations

HIV/AIDS - Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome

WHO - World Health Organization

UNAIDS - United Nations Programme on HIV/AIDS

ART - Antiretroviral Therapy

STI - Sexually Transmitted Infection

CSE - Comprehensive Sexual Education

KDHS - Kenya Demographic and Health Survey

MSM - Men Who Have Sex with Men

AGYW - Adolescent Girls and Young Women

KCRH - Kakamega County Referral Hospital

HIV - Human Immunodeficiency Virus

STI - Sexually Transmitted Infection

HIV+ - HIV Positive

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