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Comparing the Effectiveness of Community-Led Versus Facility-Based HIV Testing in Increasing Case Detection among High-Risk Populations

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ABSTRACT

The persistent burden of undiagnosed HIV infection among high-risk populations presents a critical challenge to global HIV control efforts. Despite significant advances in antiretroviral therapy and preventive interventions, traditional facility-based testing models often fail to adequately reach key populations due to stigma, discrimination, and structural barriers. In contrast, community-led HIV testing strategies have gained prominence for their decentralized, peer-driven, and user-friendly approaches. This review critically compared the effectiveness of community-led versus facility-based HIV testing in increasing case detection among high-risk groups such as sex workers, men who have sex with men, people who inject drugs, and adolescents. A qualitative literature synthesis methodology was employed to evaluate existing empirical evidence, analyze implementation models, and explore contextual factors influencing outcomes. Findings reveal that community-led approaches consistently outperform facility-based models in identifying undiagnosed cases, promoting earlier diagnosis, and enhancing linkage to care when appropriately supported. While community-led testing requires greater initial investment, it demonstrates superior cost-effectiveness in high-yield contexts due to higher case detection rates and improved access. Furthermore, it offers greater acceptability among marginalized groups, fostering trust and uptake through culturally sensitive, peer-delivered services. The review concluded that a hybrid, differentiated model integrating both strategies tailored to local epidemiology and user preferences offers the most effective path to closing the HIV diagnosis gap and achieving the UNAIDS 95-95-95 targets.

Keywords: Community-led HIV testing, Facility-based HIV testing, High-risk populations, Case detection, Linkage to care.

INTRODUCTION

Human Immunodeficiency Virus (HIV) remains a major global public health concern, particularly in low- and middle-income countries where the burden of the disease is most pronounced [1, 2]. Despite advancements in antiretroviral therapy (ART) and preventive strategies, timely diagnosis continues to be a significant bottleneck in achieving epidemic control [3, 4]. High-risk populations such as sex workers, men who have sex with men (MSM), people who inject drugs (PWID), and adolescents often encounter unique barriers to accessing HIV testing services. These include stigma, discrimination, fear of confidentiality breaches, and logistical constraints in reaching health facilities. As such, innovative and contextually appropriate testing approaches are critical to improving early diagnosis and linkage to care. Two primary testing strategies have emerged in recent years: community-led HIV testing and facility-based testing. Facility-based testing refers to the conventional model where individuals access testing through health centers, hospitals, or clinics. In contrast, community-led testing [5, 6] involves peer-led initiatives, outreach activities, mobile testing units, and door-to-door services that bring testing closer to the population. This review critically compares the effectiveness of community-led versus facility-based HIV testing in increasing case detection among high-risk populations. The analysis synthesizes evidence from empirical studies, evaluates implementation models, and explores factors influencing uptake and outcomes. Given the dynamic nature

of HIV epidemics and the urgent need to identify undiagnosed cases, especially among marginalized groups, this article aims to inform policymakers, healthcare providers, and program implementers on optimizing HIV testing strategies. The comparative assessment considers not only the detection rates but also cost-effectiveness, acceptability, sustainability, and impact on the HIV care cascade. The overarching goal is to contribute to the global discourse on differentiated service delivery by highlighting evidence-based approaches that address the testing gap and drive progress toward the 95-95-95 targets set by UNAIDS.

Overview of HIV Testing Modalities

HIV testing is a critical gateway to treatment and prevention services [7]. Traditional facility-based testing has long been the backbone of HIV diagnosis efforts. It typically involves voluntary counseling and testing (VCT), provider-initiated testing and counseling (PITC), and diagnostic testing during clinical encounters [8, 9]. These models are well-integrated into health systems and often offer linkage to immediate care and treatment services. However, facility-based models are frequently underutilized by high-risk populations due to structural and social barriers. Community-led HIV testing represents an alternative paradigm that decentralizes testing and shifts ownership to the communities most affected by the epidemic [10, 11]. This approach includes mobile clinics, peer-delivered testing, index partner testing, and targeted outreach events. The goal is to reach individuals who may not otherwise seek testing at health facilities, particularly those in rural, peri-urban, or stigmatizing environments. Community-led testing often employs rapid diagnostic tests and lay providers trained to offer pre- and post-test counseling, with established referral systems for confirmatory testing and treatment initiation. WHO and UNAIDS have endorsed differentiated testing approaches to reach the "last mile" in HIV detection, especially in high-burden settings. Innovations such as HIV self-testing (HIVST), social network testing, and integration with other community services have further enhanced the appeal and utility of community-led strategies [12]. The success of these models, however, depends heavily on community engagement, cultural appropriateness, and robust support systems.

Comparative Effectiveness in Case Detection

Evidence from various settings demonstrates that community-led HIV testing consistently outperforms facility-based testing in identifying new HIV cases among high-risk groups [13, 14]. A systematic review of randomized and observational studies showed that community-based interventions yield higher HIV positivity rates and better reach marginalized populations. For example, door-to-door testing campaigns in rural sub-Saharan Africa have identified significant numbers of previously undiagnosed individuals who had never visited a health facility for testing [15, 16]. In contrast, facility-based testing often attracts individuals with symptomatic illness or those already engaged in care, potentially missing asymptomatic cases and individuals reluctant to engage with formal health systems. The passive nature of facility-based models means that opportunities for early diagnosis among high-risk but asymptomatic individuals are frequently missed. Community-led models, by actively seeking out individuals in their own environments, reduce logistical barriers and minimize stigma [17, 18]. Mobile clinics, for instance, have successfully engaged sex workers and MSM who face discrimination in health settings. Peer-driven interventions, where members of key populations deliver testing and education, enhance trust and uptake. Additionally, index testing, which involves tracing and testing the contacts of known HIV-positive individuals, has shown higher yield in community settings due to reduced fear and increased privacy.

Impact on Linkage to Care and Treatment

While community-led HIV testing has demonstrated superior performance in case detection, its effectiveness also depends on timely linkage to care. One concern has been whether decentralized models can ensure seamless transition to ART initiation and long-term care. However, emerging evidence suggests that with appropriate support mechanisms, community-led approaches can achieve comparable or even superior linkage outcomes. Programs that incorporate community health workers, peer navigators, and case managers have reported high rates of linkage within 30 days of diagnosis [19]. Mobile clinics equipped with ART initiation capabilities further bridge the gap between testing and treatment [20]. Moreover, integration of testing with other community-based health services, such as tuberculosis screening and sexual and reproductive health, improves holistic care engagement. Facility-based settings may offer immediate access to comprehensive services but can be intimidating or inaccessible to marginalized groups. The bureaucratic and formal atmosphere of health institutions often deters individuals from returning for follow-up care. Conversely, community-led services, by fostering a non-judgmental and supportive environment, can motivate individuals to initiate and adhere to treatment.

Cost-Effectiveness and Resource Allocation

Evaluating the cost-effectiveness of HIV testing strategies is vital for resource-limited settings. Community-led testing may initially appear costlier due to logistics, staffing, and outreach requirements. However, cost per HIV-positive case identified key metric in HIV programming tends to be lower in community-based interventions

targeting high-prevalence areas or high-risk groups [21]. Several cost-effectiveness analyses have found that mobile and peer-led testing, despite higher upfront costs, yield greater long-term savings by preventing onward transmission and reducing late-stage HIV complications. Facility-based testing, while less expensive to maintain, has diminishing returns in saturated or low-prevalence areas. A hybrid model that combines both strategies, deploying community-led testing in high-yield contexts and maintaining facility-based services for general population testing, is increasingly recognized as a balanced approach. Strategic use of geospatial mapping and epidemiological data can optimize resource allocation and ensure testing services are targeted effectively.

Acceptability and User Preferences

Understanding user preferences is essential for designing effective HIV testing interventions [22]. Studies have consistently shown that high-risk populations prefer community-based options due to convenience, privacy, and reduced stigma. Adolescents and young adults, for instance, report greater willingness to test when services are offered in non-clinical settings. Peer-led models enhance acceptability by leveraging shared experiences and cultural affinity. Trust between provider and client is a critical determinant of testing uptake, and peers often possess greater insight into the unique needs of their communities. Furthermore, offering flexible hours, home visits, and multilingual services increases accessibility. Facility-based testing, while trusted for its clinical rigor and perceived credibility, is frequently associated with long wait times, bureaucratic procedures, and judgmental attitudes from staff. These deterrents disproportionately affect key populations already facing social marginalization.

Challenges and Limitations

Despite their advantages, community-led HIV testing programs are not without challenges. Ensuring quality assurance, maintaining confidentiality, and managing data securely in decentralized settings require robust training and monitoring systems [23]. Additionally, sustaining community engagement and volunteer motivation over time can be difficult without adequate incentives and support. Operational challenges such as poor road networks, supply chain disruptions, and security concerns in remote areas can hamper outreach efforts. Moreover, ensuring consistent funding and political support for community-led initiatives remains a critical issue, particularly in countries with centralized health governance structures. Facility-based testing, while logistically stable, faces its own limitations in adapting to the diverse needs of high-risk groups. Without targeted outreach, these services risk perpetuating inequities in access and health outcomes.

Future Directions and Recommendations

As the global HIV response moves toward epidemic control, scaling up effective testing strategies is paramount. The evidence favors an expansion of community-led HIV testing to close the diagnosis gap, particularly among high-risk populations. Governments and donors should invest in building the capacity of community organizations, integrating services, and institutionalizing best practices. Innovations such as digital health tools, real-time data reporting, and community mapping can enhance the reach and responsiveness of testing programs. Policies that support task-shifting, decentralization, and community empowerment will be instrumental in sustaining impact. A differentiated approach that combines the strengths of both community-led and facility-based testing tailored to local epidemiology, population preferences, and health system capabilities is likely to yield the most comprehensive results.

CONCLUSION

In the quest to achieve universal access to HIV diagnosis and treatment, the comparative effectiveness of community-led versus facility-based HIV testing has emerged as a critical consideration. This review underscores the superior performance of community-led strategies in detecting undiagnosed HIV cases among high-risk populations, driven by their accessibility, cultural sensitivity, and user-centered design. When adequately supported, community-led testing can ensure timely linkage to care and long-term treatment engagement, matching or exceeding facility-based outcomes. While challenges related to logistics, funding, and integration persist, the advantages of community-led models in reaching marginalized populations are compelling. These approaches offer a pathway to equitable and inclusive HIV care, particularly in settings where traditional health systems fall short. Conversely, facility-based testing remains essential for comprehensive service delivery and clinical management, suggesting the value of complementary models. To optimize HIV case detection and support global targets, health systems must adopt a differentiated, data-informed approach that balances efficiency, effectiveness, and equity. Empowering communities to take an active role in the HIV response not only improves outcomes but also strengthens the social fabric essential for sustaining public health gains.

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