



Article

Uptake and Determinants of Community-Based HIV Testing Services Amongst Key Populations in Ekiti State, South-West Nigeria: A Cross-Sectional Mixed-Methods Study

Chukwudike Maraizu Aku ^{1,*} , James Robson Sunday ² , Oluwaseun Kingsley Ogunla ³, Best Ordinioha ¹ and Christian Kosisochukwu Anumudu ^{4,*}

¹ School of Public Health, University of Port Harcourt, Port Harcourt 500102, Nigeria

² Department of Psychology, University of Uyo, Uyo 520003, Nigeria

³ Médecins Sans Frontières (Doctors Without Borders), Awka 420211, Nigeria

⁴ School of Chemical Engineering, University of Birmingham, Birmingham B15 2TT, UK

* Correspondence: achukwudike@ehsadi.org (C.M.A.); cka329@alumni.bham.ac.uk (C.K.A.)

Highlights

Public health relevance—How does this work relate to a public health issue?

- Community-based HIV testing improves access for highly marginalised Nigerian key populations facing stigma and structural service barriers.
- Key-population disparities highlight an urgent need for targeted HIV testing strategies in culturally conservative, underserved Nigerian settings.

Public health significance—Why is this work of significance to public health?

- Despite positive attitudes (88.7%) toward community-based HTS, stigma barriers still persist, with qualitative data highlighting fear, self-stigma, and confidentiality concerns.
- Sociodemographic determinants significantly shape HIV testing behaviours, thus a need for more equitable, context-sensitive public health interventions.

Public health implications—What are the key implications or messages for practitioners, policy makers and/or researchers in public health?

- Peer-led models, confidentiality protections, and flexible outreach are essential to strengthen HIV testing uptake among key populations.
- Policy investment is essential to sustain outreach, address funding gaps, and advance Nigeria's UNAIDS 95-95-95 progress.

Abstract

Key populations (KPs), including female sex workers (FSWs), men who have sex with men (MSM), people who inject drugs (PWID), and transgender (TG) individuals, bear a disproportionate HIV burden in Nigeria, yet sub-national evidence on community-based HIV testing services (HTS) uptake remains limited, particularly in culturally conservative settings such as Ekiti State. This study assessed knowledge, attitudes, and uptake of community-based HTS among KPs in Ekiti State and examined associated sociodemographic and psychosocial factors. A cross-sectional mixed-methods study was conducted from April to June 2025 among 424 KPs recruited through purposive selection of nine high-burden Local Government Areas and exponential non-discriminatory snowball sampling. Quantitative data were collected using an interviewer-administered questionnaire, while qualitative data comprised one focus group discussion ($n = 8$) and one key informant interview. Descriptive statistics summarised knowledge, attitudes, and community-based HTS uptake; Pearson's chi-square and Fisher–Freeman–Halton exact tests assessed associations between



Academic Editor: Nicola Magnavita

Received: 9 August 2026

Revised: 9 September 2026

Accepted: 10 September 2026

Published: 14 September 2026

Copyright: © 2026 by the authors.

Licensee MDPI, Basel, Switzerland.

This article is an open access article distributed under the terms and

conditions of the [Creative Commons](https://creativecommons.org/licenses/by/4.0/)

[Attribution \(CC BY\)](https://creativecommons.org/licenses/by/4.0/) license.

explanatory variables and HTS uptake status (never tested, previously tested, or tested within the preceding 12 months). Awareness of community-based HTS was high (90.6%), and attitudes were predominantly positive (88.7%), yet recent community-based HTS uptake, defined as HIV testing through a community-based modality within the preceding 12 months, was 64.2%. Recent uptake was lowest among MSM (58.9%) and FSWs (63.6%) and highest among PWID (78.6%) and transgender individuals (100.0%). Ever community-based HTS uptake was higher, at 72.6%. Bivariate analysis showed statistically significant associations between HTS uptake status and knowledge (Fisher–Freeman–Halton exact $p < 0.001$), attitude (Fisher–Freeman–Halton exact $p < 0.001$), sex (Fisher–Freeman–Halton exact $p = 0.024$), age (Fisher–Freeman–Halton exact test, $p = 0.002$), educational level (Fisher–Freeman–Halton exact test, $p = 0.001$), religion (Fisher–Freeman–Halton exact test, $p < 0.001$), and KP typology (Fisher–Freeman–Halton exact $p < 0.001$). Marital status was not significantly associated with uptake (Fisher–Freeman–Halton exact $p = 0.484$). Qualitative findings complemented and contextualised the quantitative patterns, identifying trust in peer-led testers, affordability, and flexible outreach as facilitators, while stigma, self-stigmatisation, and funding constraints emerged as barriers. Despite high awareness of community-based HTS (90.6%) and predominantly favourable attitudes, recent uptake remained lower, suggesting that recent uptake reflected not only individual-level factors but also social and health-system conditions, including stigma, social barriers, and constraints affecting the availability, accessibility, and continuity of services. Peer-led delivery models, strengthened confidentiality protections, and sustained programme financing are needed to close this gap and advance Nigeria’s progress toward the UNAIDS 95-95-95 targets.

Keywords: key populations; HIV testing services; community-based testing; stigma; health system

1. Introduction

Female sex workers (FSWs), men who have sex with men (MSM), people who inject drugs (PWID), and transgender (TG) individuals remain disproportionately affected by the global HIV epidemic [1]. Sub-Saharan Africa carries the heaviest burden, accounting for an estimated 67% of the 38.4 million people living with HIV worldwide, and KPs and their partners contributed 70% of new global infections in 2021 [2]. In 2022, KPs alone accounted for 65% of new HIV infections worldwide, underscoring the urgency of targeted, rather than generalised, prevention strategies [3].

In Nigeria, KPs constitute only 3.4% of the population yet account for 11% of new HIV infections [4], with prevalence among MSM, sex workers, and PWID estimated at 22.9%, 15.5%, and 9.3% respectively, far exceeding the national average of 1.3% [5]. HIV testing services (HTS) remain the critical entry point linking undiagnosed individuals to treatment and prevention, yet uptake among KPs continues to lag behind national targets, constrained by stigma, criminalisation, and structural barriers to conventional facility-based care [6]. Community-based HTS decentralised testing delivered through mobile units, home-based outreach, and peer-led models has been proposed as a strategy to circumvent these barriers by improving accessibility, confidentiality, and acceptability for populations who avoid facility-based services [7,8].

Regional evidence supports this approach: community-based and peer-led testing models have demonstrated higher case-detection rates and improved linkage to care among KPs compared with facility-based alternatives across Sub-Saharan Africa [9–11]. However, reports by Human Rights Watch [12] and the paper by Bakare [13] show that

the effectiveness of these models is shaped by local social, legal, and religious contexts. Nigeria's punitive legal environment criminalising same-sex conduct, drug use, and, in practice, sex work drives KPs underground and complicates programmatic engagement, while only a fraction of Nigerian states has enacted anti-discrimination protections relevant to HIV service access [12,14,15].

Ekiti State, in Nigeria's southwest, presents an important context for examining these barriers. The state had an estimated HIV prevalence of 0.8% among adults aged 15–64 years in the 2018 Nigeria HIV/AIDS Indicator and Impact Survey/Report by the FMOH and NACA [6]. Importantly, although Nigeria's HIV response strategy recognises stigma and discrimination as important barriers to HIV prevention, testing, treatment, and care, particularly for key populations [4], the extent and mechanisms through which HIV and KP-related stigma influence service access in Ekiti State remain insufficiently characterised. A 2023 key-population size estimation exercise identified sizeable KP communities operating across more than 2700 hotspots in the state, yet documented markedly limited coverage of HIV treatment and testing services at these hotspots, alongside minimal peer-education penetration [16]. Existing Nigerian evidence on community-based HIV care, such as work conducted in Nasarawa State, demonstrates the feasibility of community-based approaches but also highlights problems including stigma, discrimination and early attrition, and cannot be assumed to generalise to Ekiti's distinct socio-cultural environment [17].

This near-absence of sub-national, KP-specific evidence on community-based HTS uptake in a Nigerian state that has not had any specific surveys focusing on key populations motivated this present study. Understanding the knowledge, attitudes, and determinants underlying HTS uptake among KPs in Ekiti is essential to designing client-centred interventions capable of advancing Nigeria's progress toward the UNAIDS 95-95-95 targets. This study was guided conceptually by the Health Belief Model (HBM) and the Theory of Reasoned Action/Planned Behaviour (TRA/TPB), which frame health-seeking behaviour as a function of perceived risk, perceived benefits and barriers, social norms, and perceived behavioural control; these constructs informed the study's focus on knowledge, attitudes, and the structural and psychosocial factors examined as correlates of uptake. This study therefore assessed the knowledge, attitudes, and uptake of community-based HTS among KPs in Ekiti State, Nigeria, and determined the sociodemographic and psychosocial factors significantly associated with uptake, using cross-tabulated chi-square analysis.

2. Methods

2.1. Study Design and Setting

This was a cross-sectional study employing a concurrent mixed-methods approach, combining a structured quantitative survey with focus group discussions (FGDs) and a key informant interview (KII), conducted among key populations (KPs) in Ekiti State, southwestern Nigeria, from April 2025 to June 2025. Ekiti State comprises 16 Local Government Areas (LGAs) [18]. General-population HIV prevalence is estimated at 0.8%, below the national average, though sub-national data specific to KPs remain limited [5]. Community-based HTS in the state are coordinated by the Ekiti State Agency for the Control of AIDS (EKSACA) and delivered through mobile testing units, peer educators, and NGO-led outreach, with technical and financial support from PEPFAR and the Global Fund.

2.2. Theoretical and Conceptual Framework

This study was informed by the Health Belief Model (HBM) [19] and the Theory of Reasoned Action/Planned Behaviour (TRA/TPB) [20] which together provide a behavioural framework for understanding HIV testing decisions. The HBM explains health-seeking behaviour as a function of individuals' perceived susceptibility to and severity of HIV risk,

weighed against the perceived benefits of and barriers to testing. The TRA/TPB complements this perspective by recognising the influence of social norms, personal attitudes, and perceived behavioural control on health-related decisions. Together, these models suggest that HTS uptake among KPs is shaped by an interplay of individual risk perception, attitudes, and social/environmental influence.

These behavioural perspectives were considered alongside sociodemographic and contextual characteristics, including sex, age, marital status, educational attainment, and KP typology, which may shape individuals' opportunities and constraints in accessing community-based HTS. HIV testing behaviour is therefore understood as occurring within a social and health-system environment, rather than being determined solely by individual knowledge or attitudes.

2.3. Study Population and Eligibility Criteria

Participants were members of four KP sub-groups: FSW, MSM, PWID, and TG individuals aged 18 years and above, recruited from hotspots across Ekiti State. Eligibility required self-identification with one of the four KP typologies, residence or regular activity within the selected LGAs, and provision of informed consent.

2.4. Sampling Method

A multistage sampling technique was used. First, nine of the state's 16 LGAs with the highest documented concentrations of KPs were purposively selected, based on the Ekiti State HIV programme surveillance data: Ado-Ekiti, Ido-Osi, Oye, Ikole, Moba, Ikere, Ijero, Gboyin, and Ilejemeje. Given the hidden and stigmatised nature of KPs, conventional probability-based sampling frames were not feasible; participants within each LGA were therefore recruited using exponential non-discriminative snowball sampling, in which trained community mobilizers ("focal persons") from each KP typology identified initial participants who subsequently referred additional members of their networks [21,22]. For the FGD, purposive community-based selection was used to ensure representation of the four KP typologies. Two participants were selected from each typology by members of their respective communities. The KII participant was purposively selected because of their senior programme-level role within EKSACA and their knowledge of HIV prevention and HTS implementation in the state.

2.5. Sample Size Estimation

The minimum sample size was calculated using Cochran's formula ($n_0 = Z^2 p(1 - p)/e^2$), with a 95% confidence level ($Z = 1.96$), a 5% margin of error, and an anticipated HTS uptake proportion of 48.7%, informed by prior Nigerian key-population research [23]. This yielded a base sample of 384, which was increased to 427 to account for an anticipated 10% non-response rate. The adjusted sample was proportionately allocated across the nine selected LGAs (Ado-Ekiti: 87; Ido-Osi: 52; Oye: 52; Ikole: 46; Moba: 45; Ikere: 44; Ijero: 35; Gboyin: 34; Ilejemeje: 32). A final analytic sample of 424 respondents (FSW: 132; MSM: 224; PWID: 56; TG: 12) completed the quantitative survey.

2.6. Dependent Variable

The dependent variable for the bivariate analysis was community-based HTS uptake status, categorised into three mutually exclusive groups: those who had never received community-based HTS (never tested), those who had previously received community-based HTS but not within the preceding 12 months (previously tested >12 months), and those who had received community-based HTS within the preceding 12 months (tested in the last 12 months). This 12-month reference period is consistent with established survey-based HIV testing indicators used for key populations in international HIV monitoring [24].

“Tested within the preceding 12 months” constituted the primary category of substantive interest for interpretation, representing current testing coverage, while the remaining two categories provided descriptive context on lifetime service exposure. Ever having received community-based HTS is a combination of the latter two groups.

2.7. Study Hypothesis

The following null hypotheses (H_0) were tested to examine associations between the explanatory variables and community-based HTS uptake status, comprising participants who had never received community-based HTS, those who had previously received community-based HTS but not within the preceding 12 months, and those who had received community-based HTS within the preceding 12 months. The Fisher–Freeman–Halton exact test was used for bivariate associations where expected cell frequencies were insufficient to satisfy the assumptions of the Pearson chi-square test. Statistical significance was set at $p < 0.05$.

H₀₁. *There is no statistically significant association between knowledge of community-based HTS and community-based HTS uptake status among key populations in Ekiti State.*

H₀₂. *There is no statistically significant association between attitude towards community-based HTS and community-based HTS uptake status among key populations in Ekiti State.*

H₀₃. *There is no statistically significant association between community-based HTS uptake status and socio-demographic characteristics (sex, age, marital status, educational level and religion) of key populations in Ekiti State.*

H₀₄. *There is no statistically significant association between key-population typology and community-based HTS uptake status among key populations in Ekiti State.*

2.8. Data Collection Tool and Procedure

Quantitative data were collected between April 2025 and June 2025 using an interviewer-administered, semi-structured questionnaire that captured sociodemographic characteristics, knowledge of community-based HTS, attitudes toward testing, prior testing history, and perceived barriers and facilitators to uptake. Trained research assistants, drawn from the Ekiti State chapter of the National Key Population Health and Rights Network and familiar with local KP networks, administered the tool in secure, confidential hotspot-based and virtual settings, with virtual recruitment (mostly via WhatsApp) used to extend reach among MSM respondents. Qualitative data collection was originally designed as typology-specific focus group discussions (FGDs), each comprising 6–8 participants from a single KP typology (FSW, MSM, PWID, TG). However, fieldwork coincided with the U.S. PEPFAR stop-work order and associated donor funding freezes, which caused sudden operational downsizing and temporary closure of KP-led community-based organisations (KP-CBOs) in Ekiti State, thereby constraining the primary trusted access pathways for safely reaching KP members for in-person qualitative recruitment. The originally planned typology-specific FGDs could therefore not be fully implemented, and the qualitative component was consolidated into a single cross-typology FGD and one key informant interview (KII). Because the qualitative component was substantially reduced from the originally planned typology-specific FGDs, formal assessment of thematic saturation across the four KP typologies was not feasible. The FGD comprised eight participants, two representing each of the four KP typologies, drawn from the broader KP network and selected by their respective communities to represent them; the session was facilitated by two trained researchers with clinical psychology backgrounds and extensive experience working with key populations. The KII was conducted with a senior official of the Ekiti State Agency for the Control of

AIDS (EKSACA) to obtain a programme- and policy-level perspective. Together, the FGD and KII were intended to provide cross-typology community and programme-level context to explore determinants of HTS uptake in greater depth.

2.9. Validity and Reliability

The questionnaire was reviewed by three public health experts specialising in HIV research for content and construct validity, and pre-tested among 42 KPs (approximately 10% of the target sample) in a neighbouring state prior to finalisation. Internal consistency, assessed using Cronbach's alpha, was 0.88, indicating good reliability [25].

2.10. Ethical Considerations

Ethical approval was obtained from the University of Port Harcourt Ethics Committee and Ekiti State Ministry of Health Ethics Committee (EKHREC/EA/P/189). Written informed consent was obtained from questionnaire respondents and FGD participants, and verbal consent from the KII participant; all participants were informed of the study's purpose, risks, benefits, and their right to withdraw at any time. Data were collected anonymously without personal identifiers and stored in password-protected systems. FGD participants received a transportation reimbursement of ₦2000 (US \$1.30).

2.11. Data Analysis

Quantitative data were analysed using IBM SPSS version 25. Descriptive statistics (frequencies and percentages) summarised sociodemographic characteristics and levels of knowledge, attitude, and community-based HTS uptake status. Uptake status was categorised into three groups: "not tested," "previously tested >12 months," and "tested within the last 12 months." Bivariate associations between explanatory variables and HTS uptake status were assessed using contingency-table analysis. The Fisher–Freeman–Halton exact test was used where expected cell frequencies were insufficient for the assumptions of the Pearson chi-square test. Statistical significance was set at $p < 0.05$. The qualitative data from the FGD and KII were transcribed verbatim and analysed thematically using NVivo software version 12, with coding focused on participants' accounts of awareness, attitudes, testing experiences, barriers, facilitators and recommendations concerning community-based HTS. The theoretical frameworks used in the study were subsequently used to support interpretation of these themes rather than as a predetermined deductive coding framework. In particular, stigma, fear of disclosure, confidentiality concerns, social norms and perceived barriers to service access were interpreted within the broader behavioural and social context in which KP members make decisions about HIV testing.

2.12. Approach for Integrating the Quantitative and Qualitative Findings

The study utilised an interpretative integration approach. Quantitative and qualitative data for the study were collected concurrently within the same study period. These were analysed separately using their respective methods: quantitative data were analysed statistically using SPSS, while qualitative data were analysed thematically using NVivo. Integration of the two strands occurred at the interpretation and discussion stage, following a complementarity approach: findings from each strand were compared side by side, and qualitative themes were used to help explain the levels and determinants of uptake identified in the quantitative results.

3. Results

3.1. Participant Characteristics

A total of 424 KPs completed the quantitative survey (Table 1). The sample was predominantly male (64.2%), single (78.3%), Christian (91.5%), and tertiary-educated (78.3%), with over half in the 20–29-year age band (60.4%). MSM constituted the largest KP sub-group (52.8%), followed by FSWs (31.1%), PWID (13.2%), and TG individuals (2.8%).

Table 1. Sociodemographic characteristics of study participants (N = 424).

Variable	Frequency	Percentage
Sex		
Female	152	35.8
Male	272	64.2
Total	424	100.0
Marital Status		
Single	332	78.3
Married	80	18.9
Divorced	8	1.9
Widowed	4	0.9
Total	424	100.0
Religion		
Christianity	388	91.5
Muslim	28	6.6
Pagan	4	0.9
Others	4	0.9
Total	424	100.0
Age Range		
19 Years and Below	4	0.9
20–29 Years	256	60.4
30–39 Years	140	33.0
40–49 Years	24	5.7
Total	424	100.0
Educational Level		
No formal education	4	0.9
Primary	8	1.9
Secondary	80	18.9
Tertiary	332	78.3
Total	424	100.0
KP Typology		
FSW	132	31.1
MSM	224	52.8
PWID	56	13.2
TG	12	2.8
Total	424	100.0

Note: Percentages may not sum to 100.0% because of rounding. Source: Field survey, 2025.

3.2. Knowledge and Awareness of Community-Based HTS

Awareness of community-based HTS was high overall, at 90.6% (384/424). Awareness varied by KP typology, being highest among PWID and TG (100% each), followed by FSWs (128/132, 96.9%) and MSM (188/224, 83.9%), indicating that MSM, despite being the largest sub-group, were comparatively less reached by community sensitisation efforts. Of the 424 participants, 384 (90.6%) reported awareness of community-based HTS and consequently proceeded to the knowledge assessment. The remaining 40 (9.4%) participants who were unaware of community-based HTS were not included in the subsequent knowledge assessment.

Among the 384 respondents who had heard of community-based HTS, knowledge of its specific features (confidentiality, accuracy relative to facility-based testing, and linkage-to-care functions) was predominantly average: 236 (61.5%) demonstrated average knowledge, 121 (31.5%) demonstrated good knowledge, and 27 (7.0%) demonstrated poor knowledge.

3.3. Attitudes Toward Community-Based HTS

Attitudes toward community-based HTS were overwhelmingly positive. Of the 424 respondents, 376 (88.7%) expressed a positive attitude, 32 (7.5%) were indifferent, and only 16 (3.8%) expressed a negative attitude.

3.4. Uptake of Community-Based HTS

Despite high awareness and predominantly positive attitudes, recent uptake of community-based HTS, defined as having received an HIV test through a community-based modality within the preceding 12 months, was 64.2% (272/424). Uptake varied across key-population (KP) typologies, with transgender (TG) individuals reporting the highest recent uptake (12/12, 100.0%), followed by people who inject drugs (PWID) (44/56, 78.6%), female sex workers (FSWs) (84/132, 63.6%), and men who have sex with men (MSM) (132/224, 58.9%). When testing history was classified into three mutually exclusive categories, 116 respondents (27.4%) had never received community-based HTS, 36 (8.5%) had previously received community-based HTS but had not tested through a community-based modality within the preceding 12 months, and 272 (64.2%) had received community-based HTS within the preceding 12 months. Thus, 308 respondents (72.6%) had ever received community-based HTS, comprising those who tested within the preceding 12 months and those who had previously tested but not recently. Accordingly, the 64.2% estimate represents the study's primary measure of recent community-based HTS uptake.

3.5. Qualitative Findings: Determinants of Community-Based HTS Uptake

Thematic analysis of the focus group discussion ($n = 8$; two participants per KP typology) and the key informant interview with a senior Ekiti State Agency for the Control of AIDS (SACA) official identified five interrelated themes shaping community-based HTS uptake. These themes are reported descriptively below; their interpretation against the study's theoretical framework is presented in the Discussion Section.

Confidentiality and trust. Trust in testers drawn from within KP networks was repeatedly described as central to service acceptance. As one participant explained, "People feel more comfortable when the testers are from within the community. They know they can trust them" (FGD, PWID). A peer educator affirmed this dynamic from the provider side: "They trust us because we're in the system, we're in the same community" (FGD, FSW).

Incentives and accessibility. Free commodities and proximity to testing venues were identified as tangible motivators. One MSM participant noted that "incentives like condoms and lubricants are a major draw for my community," while a TG participant emphasised that "free services are a big factor. . . most people prefer them over paid services."

Stigma and self-stigmatisation. Fear of being seen accessing services emerged as the most consistently cited barrier. Participants described reluctance to test in public settings ("People like us don't want to be seen in public places. . . what will they think about me?" FGD, MSM) and characterised stigma as "a very big monster in HIV services" (FGD, PWID). The KII additionally described a pattern of self-stigmatisation, wherein KPs concealed their identity and avoided drawing attention to themselves out of internalised fear of exposure.

Political will and support. Key informant testimony emphasised that the sustainability of community-based HTS delivery was contingent on government backing: "Political will is very important. . . if the government can increase the budget, it will help a lot" (KII).

Advocacy and community campaigns. Sustained, culturally tailored advocacy including community observance days and peer-driven mobilisation was described as an effective mechanism for building awareness and countering misinformation, complementing the structural facilitators identified above.

Collectively, these qualitative accounts provide contextual and explanatory depth to the quantitative findings on community-based HTS uptake. Trust, affordability, proximity, and peer-led delivery emerged as facilitators of service use, whereas stigma, self-stigmatisation, confidentiality concerns, and constraints affecting service continuity emerged as barriers. These themes were subsequently considered alongside the quantitative patterns in HTS uptake and associated characteristics to identify areas of complementarity between the two strands.

3.6. Bivariate Associations with Recent Community-Based HTS Uptake (Quantitative)

Bivariate analysis identified statistically significant associations between recent community-based HTS uptake status and several sociodemographic and psychosocial characteristics (Table 2). Knowledge was significantly associated with HTS uptake status (Fisher–Freeman–Halton exact $p < 0.001$), with recent testing reported by 99/121 (81.8%) participants with good knowledge, compared with 158/236 (66.9%) among those with average knowledge and 11/27 (40.7%) among those with poor knowledge. Attitude was also significantly associated with uptake (Fisher–Freeman–Halton exact $p < 0.001$); recent testing was reported by 264/376 (70.2%) participants with a positive attitude, compared with 4/32 (12.5%) among those who were indifferent and 4/16 (25.0%) among those with a negative attitude. Recent uptake was significantly associated with sex (Fisher–Freeman–Halton exact $p = 0.024$), with 180/272 (66.2%) males and 92/152 (60.5%) females reporting testing within the preceding 12 months. Significant associations were also observed for age (Fisher–Freeman–Halton exact $p = 0.002$), educational level (Fisher–Freeman–Halton exact $p = 0.001$), religion (Fisher–Freeman–Halton exact $p < 0.001$), and KP typology (Fisher–Freeman–Halton exact $p < 0.001$). In contrast, marital status was not significantly associated with HTS uptake status (Fisher–Freeman–Halton exact $p = 0.484$). These findings indicate that recent community-based HTS uptake varied across several participant characteristics; however, because the analysis was bivariate and cross-sectional, the observed associations should not be interpreted as independent or causal effects.

Table 2. Determinants of community-based HTS uptake status among key populations ($N = 424$).

Factors	Never Tested	Tested in Last 12 Months	Previously Tested (>12 Months)	Total	Test Value	p -Value	Outcome
Knowledge Band ^a				384	FFH = 21.966	0.000 (exact)	Significant
Poor	14 (51.9%)	11 (40.7%)	2 (7.4%)	27			
Average	55 (23.3%)	158 (66.9%)	23 (9.7%)	236			
Good	15 (12.4%)	99 (81.8%)	7 (5.8%)	121			
Attitude Band ^b				424	FFH = 60.332	0.000 (exact)	Significant
Negative	12 (75.0%)	4 (25.0%)	0 (0.0%)	16			
Indifferent	24 (75.0%)	4 (12.5%)	4 (12.5%)	32			
Positive	80 (21.3%)	264 (70.2%)	32 (8.5%)	376			
Sex				424	FFH = 7.357	0.024 (exact)	Significant
Male	64 (23.5%)	180 (66.2%)	28 (10.3%)	272			
Female	52 (34.2%)	92 (60.5%)	8 (5.3%)	152			

Table 2. Cont.

Factors	Never Tested	Tested in Last 12 Months	Previously Tested (>12 Months)	Total	Test Value	p-Value	Outcome
Age Range ^c				424	FFH = 19.675	0.002 (exact)	Significant
≤19 years	4 (100.0%)	0 (0.0%)	0 (0.0%)	4			
20–29 years	68 (26.6%)	160 (62.5%)	28 (10.9%)	256			
30–39 years	32 (22.9%)	100 (71.4%)	8 (5.7%)	140			
40–49 years	12 (50.0%)	12 (50.0%)	0 (0.0%)	24			
Marital Status ^d				424	FFH = 4.964	0.484 (exact)	Not Significant
Divorced	4 (50.0%)	4 (50.0%)	0 (0.0%)	8			
Married	24 (30.0%)	52 (65.0%)	4 (5.0%)	80			
Single	88 (26.5%)	212 (63.9%)	32 (9.6%)	332			
Widowed	0 (0.0%)	4 (100.0%)	0 (0.0%)	4			
Educational Level ^e				424	FFH = 19.818	0.001 (exact)	Significant
No formal education	4 (100.0%)	0 (0.0%)	0 (0.0%)	4			
Primary	4 (50.0%)	4 (50.0%)	0 (0.0%)	8			
Secondary	32 (40.0%)	44 (55.0%)	4 (5.0%)	80			
Tertiary	76 (22.9%)	224 (67.5%)	32 (9.6%)	332			
Religion ^f				424	FFH = 21.187	0.000 (exact)	Significant
Christianity	108 (27.8%)	252 (64.9%)	28 (7.2%)	388			
Muslim	4 (14.3%)	16 (57.1%)	8 (28.6%)	28			
Pagan	4 (100.0%)	0 (0.0%)	0 (0.0%)	4			
Others/Nil	0 (0.0%)	4 (100.0%)	0 (0.0%)	4			
KP Typology ^g				424	FFH = 67.992	0.000 (exact)	Significant
FSW	48 (36.4%)	84 (63.6%)	0 (0.0%)	132			
MSM	68 (30.4%)	132 (58.9%)	24 (10.7%)	224			
PWID	0 (0.0%)	44 (78.6%)	12 (21.4%)	56			
TG	0 (0.0%)	12 (100.0%)	0 (0.0%)	12			

FFH = Fisher–Freeman–Halton Exact Test (used where Pearson chi-square assumptions were violated by small expected cell counts). ^a N = 384 because only participants who reported awareness of community-based HTS proceeded to the knowledge assessment; the 40 participants who were unaware of community-based HTS were not administered the subsequent knowledge questions. ^b 1 cell (11.1%), min. expected count: 2.25. ^c 4 cells (33.3%), min. expected count: 0.34. ^d 5 cells (41.7%), min. expected count: 0.34. ^e 5 cells (41.7%), min. expected count: 0.34. ^f 7 cells (58.3%), min. expected count: 0.34. ^g 3 cells (25.0%), min. expected count: 1.02. Source: Field Survey, 2025.

3.7. Integration of Quantitative and Qualitative Findings

Integration of the quantitative and qualitative findings was undertaken by examining how the qualitative accounts complemented and contextualised the quantitative patterns observed in community-based HTS uptake status. The quantitative findings established the magnitude and distribution of awareness, attitudes, recent HTS uptake, and associations between HTS uptake status and participant characteristics, while the qualitative findings provided contextual explanations for how social, behavioural, and service-related conditions may influence these patterns. A central area of complementarity was the difference between high awareness and favourable attitudes and the lower level of recent HTS uptake. Quantitatively, 90.6% of participants were aware of community-based HTS and 88.7% expressed a positive attitude, whereas 64.2% reported receiving community-based HTS within the preceding 12 months. The qualitative findings provided contextual depth to this pattern by identifying stigma and self-stigmatisation, concerns about confidentiality and disclosure, accessibility and affordability, flexibility of outreach, and continuity of services as factors influencing testing behaviour. Thus, the qualitative evidence helped contextualise why awareness and favourable attitudes did not necessarily translate into recent uptake.

Complementarity was also evident in relation to the observed differences across KP typologies. Quantitatively, recent uptake was lowest among MSM (58.9%) and FSWs (63.6%), compared with PWID (78.6%) and TG individuals (100.0%). The qualitative findings provided context for these differences by highlighting concerns about visibility and disclosure among participants and occupational and economic constraints affecting FSWs. Similarly, the quantitative finding that knowledge and attitude were significantly associated with HTS uptake status was interpreted alongside qualitative accounts emphasising trust in peer-affiliated testers, accessibility, and community-based outreach as conditions that may facilitate the translation of knowledge and favourable perceptions into service use. The two strands therefore contributed different but complementary forms of evidence: quantitative findings demonstrated the extent and distribution of observed patterns, whereas qualitative findings contributed experiential and contextual explanations for those patterns. The findings were integrated at the level of interpretation rather than by statistically combining the datasets.

4. Discussion

This study examined knowledge, attitudes, and uptake of community-based HTS, alongside associated sociodemographic and psychosocial factors, among 424 key populations in Ekiti State, Nigeria. Awareness of community-based HTS was high (90.6%), and attitudes were predominantly positive (88.7%); however, recent community-based HTS uptake was lower at 64.2%. In comparison, 72.6% of participants reported having ever received community-based HTS, indicating that previous access to community-based testing did not uniformly translate into recent uptake. This difference suggests that high awareness and favourable attitudes alone may not be sufficient to ensure sustained engagement with community-based HTS. The qualitative findings further indicate that uptake was shaped by factors extending beyond individual knowledge and attitudes, including stigma and self-stigmatisation, concerns about confidentiality and trust, accessibility and affordability of services, flexibility of outreach, and constraints affecting the continuity of community-based service delivery. The complementarity between the two strands is important: the quantitative findings established the magnitude and distribution of HTS uptake status, whereas the qualitative findings provided contextual explanations for the observed gap between awareness, favourable attitudes, and recent service uptake. Taken together, these findings highlight the importance of addressing both individual-level and social and health-system barriers to sustain community-based HTS engagement among KPs in resource-constrained settings.

4.1. Knowledge of Community-Based HTS

The high baseline awareness of community HTS (90.6%) documented among key populations in Ekiti State demonstrates the profound capability of targeted, decentralised health frameworks to penetrate marginalised networks. This success directly aligns with the community-driven interventions evaluated by Shaw et al. [26] in Kenya, which achieved a high awareness threshold between 75% and 94% among men who have sex with men (MSM). It also mirrors the structural effectiveness observed by Nangendo et al. [27] in Uganda, where localised, peer-driven models successfully mobilised high-risk populations. By using peer mobilisers and secure hotspots, Ekiti's platform bypassed the deep-seated informational voids historically seen in marginalised populations, such as the severe deficits documented among key groups in Iran [28]. However, the friction observed in this study, where detailed procedural knowledge regarding testing accuracy and linkage functions remained merely average (61.5%) despite high general awareness, empirically validates the warning by Khan et al. [29]. This cross-regional dissonance underscores that an acute

gap frequently persists between superficial community-based HTS knowledge and actual, procedurally sound HTS usage, indicating that outreach platforms must transition from simple visibility campaigns toward deeper, procedurally focused health education.

This likely reflects the more targeted nature of community-based sensitisation, peer education, and NGO-led outreach specifically directed at KP hotspots in Ekiti, consistent with prior Nigerian evidence that peer-driven, community-facilitated HTS models improve reach and awareness among key populations in resource-limited settings [30,31]. Notably, awareness was not uniform across typologies: MSM, despite constituting the largest sub-group (52.8%) in this sample, reported the lowest awareness (83.9%), compared with 100% among PWID and TG. This suggests that outreach channels reaching FSWs and PWID hotspots directly may be less effective at penetrating the comparatively more concealed and dispersed MSM networks, a pattern also noted qualitatively by the key informant, who described NGO outreach as more consistently effective for FSWs than for harder-to-reach typologies. Where moderate overall knowledge coexisted with persistent misconceptions about testing-specific procedures and prevention methods, underscoring that awareness campaigns alone may be insufficient without deeper, procedurally focused health education [32].

4.2. Interpretation of Attitudes Toward Community-Based HTS

The overwhelmingly positive attitude (88.7%) toward community HTS in this sample highlights a distinct structural preference for decentralised care over conventional, facility-based health institutions. This favourable attitudinal profile is strongly supported by the comparative findings of Inghels et al. [30], who demonstrated that key populations systematically prefer community-based testing (CBT) hubs over general public hospitals due to severe, recurrent anxieties surrounding clinical stigmatisation, judgmental staff attitudes, and direct violations of patient privacy. In Ekiti's culturally conservative setting, the peer-led nature of the community model directly answers the core operational prerequisites identified by Charurat et al. [33], which assert that marginalised populations are highly open to diagnostic platforms if the services are customised to match their unique situations and safety requirements. By removing the stigmatising architecture of traditional public infrastructure, the community platform establishes an affirming, high-trust environment. This directly mitigates the fear of institutional exposure and police harassment that Sanni et al. [34] identified as fatal barriers to conventional healthcare utilisation among Nigerian MSM, thereby maximising client acceptability.

Attitudes toward community-based HTS were markedly more favourable in this KP sample than the general-youth attitudes reported in a study by Ndim et al. [35], where only 20.3% expressed a distinctly positive attitude despite a comparably high mean attitude score. This divergence may reflect the direct relevance of community-delivered, peer-mediated testing to KPs, who, unlike general-population youth, face specific, well-documented barriers to facility-based care rooted in anticipated institutional stigma and confidentiality concerns [4,6,36,37]. The qualitative findings complemented this quantitative pattern by providing contextual explanations for the favourable attitudinal profile. Participants consistently described trust in peer-affiliated testers, convenience relative to facility-based alternatives, and the value of complementary incentives (condoms, lubricants) as drivers of favourable attitudes, consistent with prior Nigerian findings that satisfaction with peer-led HIV prevention facilities and community-based delivery strategies strengthens acceptance and trust among key populations [23,33,34]. Nonetheless, favourable attitudes coexisted with persistent, typology-specific anxieties. Qualitative accounts from MSM and TG participants in particular articulated fear that visibility at a testing site would itself be stigmatising or incriminating, a concern consistent with Nigeria's criminalisation of

same-sex conduct [12,13] and with broader evidence identifying intersecting HIV-related stigma as a persistent barrier across the HIV care cascade for sex workers, MSM, and transgender populations [37,38].

4.3. Interpretation of Community-Based HTS Uptake

Recent community-based HTS uptake was 64.2%, with nearly two-thirds of participants reporting HIV testing through a community-based modality within the preceding 12 months. This level of recent uptake was broadly comparable to the Sub-Saharan African multi-country testing average of 65.01% modelled by Sabo et al. [39], although marginally lower. The finding suggests substantial reach of community-based HTS among KPs in the study population, while also indicating that a sizeable proportion had not accessed community-based testing recently. The substantial disparities observed across local typologies demand careful cross-examination. Within the Health Belief Model, such typology-specific disparities are more plausibly explained by differential perceived barriers to testing than by uniform differences in risk perception or motivation across KP sub-groups. MSM had the lowest recent community-based HTS uptake in the present study (58.9%), followed by FSWs (63.6%). The MSM finding contrasts with evidence from Côte d'Ivoire, where Inghels et al. [23] reported that 74.1% of MSM had been tested for HIV during the preceding 12 months, with 47.5% reporting more than one test during that period at a community-based testing site but also alluded that MSMs are affected by societal stigma which can drastically reduce their access to community-based testing services, and for the FSW, the finding sharply contradicts the historical public health paradigm established by Nnko et al. [40], which claims that sex workers are typically the most common and accessible group for HIV testing due to high self-perceived risk and dense programmatic targeting. The qualitative findings therefore provided an explanatory context for the quantitative subgroup pattern, rather than merely reproducing the observed difference. Our qualitative accounts reveal that this deficit is driven by acute opportunity costs, where time spent away from solicitation spaces translates to direct income penalties, a structural perceived barrier, in HBM terms, that outweighs the perceived benefit of testing during peak working days. To circumvent this, interventions must adapt the structural adjustments detailed by Mulongo et al. [41] in the Democratic Republic of Congo, where offering rapid HTS directly within entertainment hotspots during night shifts successfully accommodated the busy occupational schedules of vulnerable women; this is also supported by the work of Shokoohi et al. [28], which is further supported by the work of Wanyenze et al. [42] illustrating that structural and economic barriers can offset high awareness and generally positive attitudes towards uptake of HTS amongst FSWs. Conversely, the relatively high recent uptake observed among PWID (78.6%) and TG individuals (100.0%) should be interpreted cautiously given the small subgroup sizes, particularly for TG participants ($n = 12$). Rather than being interpreted as evidence of universally high access, these estimates may partly reflect the characteristics of participants reached through the study's snowball recruitment. Recruitment through established peer networks may have preferentially reached individuals already connected to community-based organisations or HIV services, thereby underrepresenting less-connected or unreached members of this population. As synthesised in the global review by Suthar et al. [43], mobile and community-led frameworks routinely exhibit vast uptake fluctuations (ranging from 9% to 100%) based entirely on method selection. Because the absolute sample sizes for these two strata were exceptionally small, our recruitment chains likely became encapsulated within highly active, pre-mobilised peer hubs already linked to civil society support, failing to capture the wider, unreached population segments in Ekiti State [44].

4.4. Determinants of Community-Based HTS Uptake

Bivariate analysis identified significant associations between recent community-based HTS uptake and several sociodemographic and psychosocial characteristics. Educational level was significantly associated with recent uptake ($p = 0.001$), with recent testing reported by 67.5% of participants with tertiary education, compared with 55.0% of those with secondary education and 50.0% of those with primary education. This pattern is strongly corroborated by the multi-country analysis conducted by Ijaiya et al. [45] across ten Sub-Saharan nations, which reported a significant association between educational attainment and HIV testing uptake. This educational predictor is further mirrored in the sweeping regional datasets of Sabo et al. [39], who analysed a massive weighted sample of 283,936 adults across 13 Sub-Saharan African countries and mathematically identified high educational attainment (primary, secondary, and higher strata) as one of the most critical driving forces of expanded HIV testing coverage. Furthermore, the strong statistical influence of age bands (Fisher–Freeman–Halton exact test, $p = 0.002$) and sex (Fisher–Freeman–Halton exact test, $p = 0.024$) in our sample closely mirrors the multivariable regression modelling executed by Adugna & Worku [46] in East Africa, where testing coverage was found to be tightly, positively correlated with older age brackets and health literacy exposure. The particularly strong association observed for educational level is consistent with prior Nigerian evidence identifying education as a significant factor influencing HIV testing uptake among key populations and with broader findings that identify education as a predictor of testing uptake [47–49]. In the present study, recent community-based HTS uptake was also significantly associated with religion (Fisher–Freeman–Halton exact test, $p < 0.001$) and KP typology (Fisher–Freeman–Halton exact test, $p < 0.001$), while marital status was not significantly associated with uptake (Fisher–Freeman–Halton exact test, $p = 0.484$), as strongly corroborated by the study of Jiao et al. [48]. These findings indicate that recent community-based HTS uptake was not uniformly distributed across the study population and varied according to participants' sociodemographic characteristics and KP typology. However, our findings diverge sharply from general population samples because sociodemographic characteristics were significantly associated with uptake alongside qualitative evidence of stigma and other barriers. This suggests that within deeply hidden and marginalised populations, structural demographic characteristics act as immediate, direct gates to healthcare access rather than secondary or distal influences, unlike the Cameroonian study by Ndim et al. [35]. This pattern is supported by the Theory of Planned Behaviour, which suggests that structural and demographic circumstances operate primarily through the construct of perceived behavioural control, which directly constrains or enables the capacity to act on testing intentions rather than through behavioural inclinations alone. Psychosocially, more than half of respondents (57.5%) identified fear of stigma as a barrier to uptake, while structural facilitators, principally free service provision and flexible outreach hours, were valued by 89.6% of respondents; this corresponds with the findings of Emmanuel et al. [36]. However, these associations should not be interpreted as independent or causal effects because the analysis was cross-sectional and bivariate. Rather, they highlight population characteristics that may interact with social, behavioural, and health-system factors to shape access to and uptake of community-based HTS. The qualitative findings provide complementary context for interpreting these quantitative associations. While the bivariate analysis identifies population characteristics associated with differences in HTS uptake, the qualitative accounts suggest that these differences may operate through the social and service environments in which testing decisions are made. Participants' descriptions of stigma, confidentiality concerns, trust in peer-affiliated providers, occupational constraints, accessibility, and service continuity illustrate mechanisms through which demographic and typology-related circumstances may influence the

practical ability to access community-based HTS. The qualitative findings therefore do not establish explanations for the statistical associations independently, but they provide contextual insight into the social and health-system conditions within which these associations may arise.

4.5. Applications of the Theoretical Framework to Qualitative Findings

The five qualitative themes identified in this study map onto complementary constructs of the Health Belief Model and the Theory of Reasoned Action/Planned Behaviour, offering a behavioural lens on the barriers and facilitators shaping community-based HTS uptake. Confidentiality and trust in peer-affiliated testers reflect both an HBM perceived-barrier reduction (removing the threat of exposure that would otherwise deter testing) and a TPB subjective-norms effect, whereby trust embedded within KP peer networks legitimises testing as a socially sanctioned behaviour within the community. Incentives and accessibility correspond to the HBM construct of perceived benefits, wherein tangible commodities and reduced logistical burden increase the net perceived value of testing relative to its costs. Stigma and self-stigmatisation operate as a compounded barrier across both frameworks: within the HBM, stigma constitutes a direct perceived barrier to testing, while within the TPB it functions through subjective norms and internalised negative attitudes, producing the self-concealment behaviour described by the key informant. Political will and sustained programme financing correspond to a structural dimension of perceived behavioural control in the TPB, in that the availability, funding, and continuity of services determine the degree of actual control individuals have over accessing testing, independent of their personal motivation. Finally, advocacy and community campaigns function as HBM's "cues to action," externally prompting engagement with testing services and reinforcing the perceived susceptibility and benefit judgements that motivate uptake. Considered together, these theoretical linkages suggest that community-based HTS uptake among KPs in Ekiti State is shaped by an interaction between individual-level behavioural constructs and the structural conditions that determine whether those constructs can be acted upon.

4.6. Health System Influence on Community-Based Testing

These findings, together with the KII's identification of donor funding disruptions, position Ekiti State's localised testing bottlenecks squarely within the broader global health financing crisis. Rather than representing a speculative or emerging threat to service continuity, these localised gaps are a direct micro-level manifestation of the sweeping 2025 PEPFAR stop-work order. These immediate programmatic pauses caused severe delivery friction for decentralised frameworks across Sub-Saharan Africa [50–52]. This study's outcomes empirically validate the mathematical projections modelled by Ten Brink et al. [53], which demonstrated that severe international aid restrictions rapidly depress community-level prevention infrastructure and disproportionately affect key-population sub-groups who depend heavily on non-facility testing avenues.

5. Recommendations

Based on these empirical insights, the following multi-level, structural interventions are recommended to stabilise service delivery and advance Nigeria's progress toward the UNAIDS 95-95-95 targets:

1. Institutionalise domestic health system financing structures: To insulate essential key-population programming from sudden international funding suspensions such as the foreign aid freezes observed during this study window, the Ekiti State Government, through the Ekiti State Agency for the Control of AIDS (EKSACA), must

establish domestic supplementary matching funds. Transitioning from absolute donor dependence to a co-financed model will ensure supply-chain resilience, securing uninterrupted access to rapid diagnostic test kits, mobile outreach vehicles, and community mobilizer stipends during global macro-financing transitions.

2. Deploy low-barrier, flexible service delivery models: Health system delivery frameworks must adapt to the rigid economic realities of highly marginalised sub-populations. To address the suboptimal uptake among female sex workers (63.6%) driven by occupational time constraints and direct income loss, outreach configurations should transition away from rigid daytime clinical hours. Implementing evening and night-shift testing sweeps within identified entertainment hotspots, alongside the monitored distribution of HIV Self-Testing (HIVST) kits through peer-led networks, will effectively eliminate the financial opportunity costs associated with seeking diagnostic care.
3. Strengthen structural confidentiality and peer-led safety infrastructure: Because pervasive social stigma and fear of disclosure remain profound deterrents against uptake, the health system must expand and codify its integration of peer-led delivery models. Transitioning traditional public diagnostic architectures into discreet, community-based hubs managed by culturally competent, peer-affiliated teams will maximise psychological safety. Furthermore, establishing explicit, localised confidentiality protections within community outreach platforms is essential to mitigate the pervasive fear of institutional profiling and legal exposure, thereby converting favourable community attitudes into sustained testing engagement.

Limitations of the Study

Several limitations warrant consideration. First, the use of non-probability (purposive and snowball) sampling, necessitated by the hidden and stigmatised nature of KPs, limits the generalizability of findings to all KPs in Ekiti State; participants more connected to community-based organisations and peer networks may be overrepresented, particularly among PWID and TG, whose apparent 100% uptake and awareness should be interpreted with caution given their small sample sizes. Second, the criminalised and stigmatised status of several KP typologies may have led some respondents to underreport testing history or under-disclose identity-related information, potentially biasing prevalence and uptake estimates [22,44]. Third, the cross-sectional design captures associations at a single point in time and does not support causal inference regarding the direction of influence between knowledge, attitudes, and uptake. Fourth, formal qualitative saturation was not prospectively assessed because the planned typology-specific FGDs could not be completed following disruption of the established KP-CBO recruitment pathways during the study period. Given the resulting consolidation into a single cross-typology FGD comprising eight participants and one KII, the qualitative sample was considered insufficient to support a defensible claim of thematic saturation across all four KP typologies. The qualitative findings should therefore be interpreted as exploratory and contextual rather than as exhaustive representations of group-specific experiences.

6. Conclusions

This study demonstrates that improving community-based HIV testing among key populations in Ekiti State requires attention to the interconnected individual, social, and health-system factors that shape service uptake. Although awareness of community-based HTS was high (90.6%) and attitudes were predominantly positive (88.7%), recent uptake was lower, with 64.2% of participants reporting testing through a community-based modality within the preceding 12 months. The higher proportion reporting ever

use of community-based HTS (72.6%) further indicates that previous engagement with community-based testing did not consistently translate into recent uptake. The findings therefore suggest that awareness and favourable attitudes alone are insufficient to ensure sustained engagement with community-based HTS.

Consistent with the Health Belief Model and the Theory of Reasoned Action/Theory of Planned Behaviour, the findings suggest that perceived barriers, perceived benefits, social norms, and perceived behavioural control may help explain testing behaviour among KPs, as reflected in the qualitative themes of confidentiality and trust, incentives and accessibility, stigma and self-stigmatisation, political will, and community advocacy. The qualitative findings further demonstrate that these behavioural processes operate within broader social and health-system constraints, including stigma and self-stigmatisation, concerns about confidentiality and trust, affordability, outreach flexibility, and continuity of service delivery. While the study does not establish causal effects of programme financing or service disruptions, the reported funding and continuity constraints highlight the vulnerability of community-based prevention services to disruptions in programme support. Sustained investment in peer-led, confidential, accessible, and context-responsive community-based HTS, alongside measures that strengthen health systems, is therefore important for improving recent HIV testing uptake among KPs in resource-constrained settings.

Author Contributions: Conceptualisation, C.M.A.; Methodology, J.R.S. and C.K.A.; Writing—original draft, C.M.A., J.R.S., O.K.O., B.O. and C.K.A.; Writing—review and editing, C.M.A., J.R.S., O.K.O., B.O. and C.K.A.; Validation, O.K.O., B.O. and C.K.A.; Supervision, B.O. All authors were involved in the writing and editing of this manuscript and have approved its submission for publication. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Ethical clearance for this study protocol was formally requested and granted by the Ekiti State Ministry of Health Ethical Review Committee (Registration Number: EKHREC/EA/P/189, approval date: 5 April 2025). All field operational methodologies were executed following international human rights guidelines and the Declaration of Helsinki.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The original contributions presented in this study are included in the article. Further inquiries can be directed to the corresponding authors.

Conflicts of Interest: The authors declare no conflicts of interest.

References

1. Moyo, E.; Moyo, P.; Murewanhema, G.; Mhango, M.; Chitungo, I.; Dzinamarira, T. Key populations and Sub-Saharan Africa's HIV response. *Front. Public Health* **2023**, *11*, 1079990. [[CrossRef](#)] [[PubMed](#)]
2. UNAIDS. *Full Report—In Danger: UNAIDS Global AIDS Update 2022*; UNAIDS: Geneva, Switzerland, 2022.
3. UNAIDS. *The Path That Ends AIDS 2023 UNAIDS Global AIDS Update Executive Summary*; UNAIDS: Geneva, Switzerland, 2023.
4. NACA. *National HIV and AIDS Strategic Framework 2021–2025*; NACA: Abuja, Nigeria, 2021.
5. NACA. *Nigeria Prevalence Rate*; NACA: Abuja, Nigeria, 2022.
6. FMOH; NACA. *Nigeria HIV/AIDS Indicator and Impact Survey (NAIIS)*; Government of Nigeria: Abuja, Nigeria, 2019.
7. Herce, M.E.; Miller, W.M.; Bula, A.; Edwards, J.K.; Sapalalo, P.; Lancaster, K.E.; Mofolo, I.; Furtado, M.L.M.; Weir, S.S. Achieving the first 90 for key populations in sub-Saharan Africa through venue-based outreach: Challenges and opportunities for HIV prevention based on PLACE study findings from Malawi and Angola. *J. Int. AIDS Soc.* **2018**, *21*, e25132. [[CrossRef](#)] [[PubMed](#)]
8. Sharma, M.; Ying, R.; Tarr, G.; Barnabas, R. Systematic review and meta-analysis of community and facility-based HIV testing to address linkage to care gaps in sub-Saharan Africa. *Nature* **2015**, *528*, S77–S85. [[CrossRef](#)] [[PubMed](#)]
9. Lindsay, B.R.; Mwango, L.; Toeque, M.G.; Malupande, S.L.; Nkhuwa, E.; Moonga, C.N.; Chilambe, A.; Sakala, H.; Kafunda, I.; Olowski, P. Peer community health workers improve HIV testing and ART linkage among key populations in Zambia: Retrospective observational results from the Z-CHECK project, 2019–2020. *J. Int. AIDS Soc.* **2022**, *25*, e26030. [[CrossRef](#)] [[PubMed](#)]

10. Mwango, L.; Toeque, M.G.; Lindsay, B.; Tembo, K.; Sakala, H.; Reggee, S.; Malunga, S.M.; Kabwe, M.; Kafunda, I.; Olufunso, A. Reaching transgender populations in Zambia for HIV prevention and linkage to treatment using community-based service delivery. *J. Int. AIDS Soc.* **2022**, *25*, e25995. [CrossRef] [PubMed]
11. Mwango, L.K.; Stafford, K.A.; Blanco, N.C.; Lavoie, M.C.; Mujansi, M.; Nyirongo, N.; Tembo, K.; Sakala, H.; Chipukuma, J.; Phiri, B. Index and targeted community-based testing to optimize HIV case finding and ART linkage among men in Zambia. *J. Int. AIDS Soc.* **2020**, *23*, e25520. [CrossRef] [PubMed]
12. Human Rights Watch. World Report 2022: Nigeria | Human Rights Watch. In *World Report 2022: Events of 2021*; Human Rights Watch: New York, NY, USA, 2022.
13. Bakare, S. *Key Population, HIV and Human Rights in Nigeria: Country Context Analysis* (October 23, 2022); SSRN: Rochester, NY, USA, 2022.
14. NACA. *National Plan of Action for the Removal of Legal and Human Rights' Barriers to HIV Response in Nigeria*; NACA: Abuja, Nigeria, 2016.
15. NACA. *Key Population Programmatic Mapping and Size Estimation Study in 20 States*; NACA: Abuja, Nigeria, 2023.
16. NACA. *Report of the Key Population Programme Review in Nigeria*; NACA: Abuja, Nigeria, 2024.
17. Ibiloye, O.; Decroo, T.; Eyona, N.; Eze, P.; Agada, P. Characteristics and early clinical outcomes of key populations attending comprehensive community-based HIV care: Experiences from Nasarawa State, Nigeria. *PLoS ONE* **2018**, *13*, e0209477. [CrossRef] [PubMed]
18. Agbebi, P.; Ogunjinmi, A.; Oyeleke, O.; Adetola, B. Developing cluster for mountains and hills tourism in Ekiti State, southwest, Nigeria. *J. Tour. Manag. Res.* **2021**, *8*, 57–67. [CrossRef]
19. Rosenstock, I.M. The Health Belief Model and Preventive Health Behavior. *Health Educ. Monogr.* **1974**, *2*, 354–386. [CrossRef]
20. Ajzen, I. The theory of planned behavior. *Organ. Behav. Hum. Decis. Processes* **1991**, *50*, 179–211. [CrossRef]
21. Heckathorn, D.D. Respondent-driven sampling: A new approach to the study of hidden populations. *Soc. Probl.* **1997**, *44*, 174–199. [CrossRef]
22. Ting, H.; Memon, M.A.; Thurasamy, R.; Cheah, J.-H. Snowball sampling: A review and guidelines for survey research. *Asian J. Bus. Res.* **2025**, *15*, 1–15. [CrossRef]
23. Ochonye, B.; Folayan, M.O.; Fatusi, A.O.; Emmanuel, G.; Adepoju, O.; Ajidagba, B.; Jaiyebo, T.; Umoh, P.; Yusuf, A. Satisfaction with use of public health and peer-led facilities for HIV prevention services by key populations in Nigeria. *BMC Health Serv. Res.* **2019**, *19*, 856. [CrossRef] [PubMed]
24. UNAIDS. HIV Testing and Status Awareness Among Key Populations (A–D). Available online: <https://indicatorregistry.unaids.org/indicator/knowledge-hiv-status-among-key-populations-d?> (accessed on 6 September 2026).
25. Bujang, M.A.; Omar, E.D.; Baharum, N.A. A review on sample size determination for Cronbach's alpha test: A simple guide for researchers. *Malays. J. Med. Sci. MJMS* **2018**, *25*, 85. [CrossRef] [PubMed]
26. Shaw, S.Y.; Leung, S.; Isac, S.; Musyoki, H.; Mugambi, M.; Kioko, J.; Musimbi, J.; Olango, K.; Kuria, S.; Ongaro, M.K. Assessing awareness and use of HIV self-testing kits after the introduction of a community-based HIV self-testing programme among men who have sex with men in Kenya. *PLoS Glob. Public Health* **2023**, *3*, e0001547. [CrossRef] [PubMed]
27. Nangendo, J.; Katahoire, A.R.; Karamagi, C.A.; Obeng-Amoako, G.O.; Muwema, M.; Okiring, J.; Kabami, J.; Semitala, F.C.; Kalyango, J.N.; Wanyenze, R.K. Uptake and perceptions of oral HIV self-testing delivered by village health teams among men in Central Uganda: A concurrent parallel mixed methods analysis. *PLoS Glob. Public Health* **2023**, *3*, e0002019. [CrossRef] [PubMed]
28. Shokoohi, M.; Noori, A.; Karamouzian, M.; Sharifi, H.; Khajehkazemi, R.; Fahimfar, N.; Hosseini-Hooshyar, S.; Kazerooni, P.A.; Mirzazadeh, A. Remaining gap in HIV testing uptake among female sex workers in Iran. *AIDS Behav.* **2017**, *21*, 2401–2411. [CrossRef] [PubMed]
29. Khan, M.N.M.; Sarwar, G.; Irfan, S.D.; Gourab, G.; Rana, A.M.; Khan, S.I. Understanding the barriers of HIV testing services for men who have sex with men and transgender women in Bangladesh: A qualitative study. *Community Health Equity Res. Policy* **2022**, *42*, 309–323. [CrossRef] [PubMed]
30. Inghels, M.; Kouassi, A.K.; Niangoran, S.; Bekelynck, A.; Carilon, S.; Sika, L.; Koné, M.; Danel, C.; Degrées du Loû, A.; Larmarange, J. Preferences and access to community-based HIV testing sites among men who have sex with men (MSM) in Côte d'Ivoire. *BMJ Open* **2022**, *12*, e052536. [CrossRef] [PubMed]
31. Krabbenborg, N.; Spijker, R.; Żakowicz, A.M.; de Moraes, M.; Heijman, T.; de Coul, E.O. Community-based HIV testing in The Netherlands: Experiences of lay providers and end users at a rapid HIV test checkpoint. *AIDS Res. Ther.* **2021**, *18*, 34. [CrossRef] [PubMed]

32. Sharma, A.; Sullivan, S.P.; Stephenson, R.B. Detailed knowledge about HIV epidemiology and transmission dynamics and their associations with preventive and risk behaviors among gay, bisexual, and other men who have sex with men in the United States. *JMIR Public Health Surveill.* **2017**, *3*, e7255. [[CrossRef](#)] [[PubMed](#)]
33. Charurat, M.; Emmanuel, B.; Akolo, C.; Keshinro, B.; Nowak, R.; Kennedy, S.; Orazulike, I.; Ake, J.; Njoku, O.; Baral, S. Uptake of treatment as prevention for HIV and continuum of care among HIV-positive men who have sex with men in Nigeria. *J. Acquir. Immune Defic. Syndr.* **2015**, *68*, S114. [[CrossRef](#)] [[PubMed](#)]
34. Sanni, F.; Abang, R.; Emmanuel, G.; Kalaiwo, A.; Motilewa, O.; Amechi, P.; Umoh, P.; Ochonye, B.B. Barriers and facilitators in accessing HIV prevention services for men having sex with men (MSM): A comprehensive analysis. *Babcock Univ. Med. J.* **2024**, *7*, 195–208. [[CrossRef](#)]
35. Ndim, M.C.F.; Cho, F.N.; Tongwa, D.Z.; Kum, S.A.; Tatah, C.A.; Ngome, F.N.; Chi, Y.M.; Kofon, J.P.; Mbonigaba, E.; Nyanjoh, E.M. Knowledge, attitudes, stigma perceptions, and practices towards HIV testing among youths aged 18–35 years in Kumba, Cameroon: A community-based cross-sectional study. *BMC Public Health* **2025**, *25*, 3061. [[CrossRef](#)] [[PubMed](#)]
36. Emmanuel, G.O.; Sanni, O.F.; Roger, A.; Umoh, P.; Boniface, O.B.; Paul, A.; Yahaya, I.M.; Auwal, A.M. Improving HIV prevention for key populations in Nigeria: Insights on access, barriers, stigma, and service utilization. *Int. J. Matern. Child Health AIDS* **2025**, *14*, e005. [[CrossRef](#)] [[PubMed](#)]
37. Logie, C.H.; Kinitz, D.J.; Gittings, L.; Lalor, P.; MacKenzie, F.; Newman, P.A.; Baral, S.D.; Mbuagbaw, L.; Shuper, P.; Levermore, K. Intersecting stigma and the HIV care cascade: Qualitative insights from sex workers, men who have sex with men, and transgender women living with HIV in Jamaica. *AIDS Behav.* **2024**, *28*, 3768–3786. [[CrossRef](#)] [[PubMed](#)]
38. Odimegwu, C.O.; Akinyemi, J.O.; Alabi, O.O. HIV-stigma in Nigeria: Review of research studies, policies, and Programmes. *AIDS Res. Treat.* **2017**, *2017*, 5812650. [[CrossRef](#)] [[PubMed](#)]
39. Sabo, K.G.; Seifu, B.L.; Kase, B.F.; Asebe, H.A.; Asmare, Z.A.; Asgedom, Y.S.; Shibeshi, A.H.; Tebeje, T.M.; Lombebo, A.A.; Fente, B.M. Factors influencing HIV testing uptake in Sub-Saharan Africa: A comprehensive multi-level analysis using demographic and health survey data (2015–2022). *BMC Infect. Dis.* **2024**, *24*, 821. [[CrossRef](#)] [[PubMed](#)]
40. Nnko, S.; Nyato, D.; Kuringe, E.; Casalini, C.; Shao, A.; Komba, A.; Changelucha, J.; Wambura, M. Female sex workers perspectives and concerns regarding HIV self-testing: An exploratory study in Tanzania. *BMC Public Health* **2020**, *20*, 959. [[CrossRef](#)] [[PubMed](#)]
41. Mulongo, S.; Kapila, G.; Hatton, T.; Canagasabey, D.; Arney, J.; Kazadi, T.; Scott, L.M.; Colfax, G. Applying innovative approaches for reaching men who have sex with men and female sex workers in the Democratic Republic of Congo. *JAIDS J. Acquir. Immune Defic. Syndr.* **2015**, *68*, S248–S251. [[CrossRef](#)] [[PubMed](#)]
42. Wanyenze, R.K.; Musinguzi, G.; Kiguli, J.; Nuwaha, F.; Mujisha, G.; Musinguzi, J.; Arinaitwe, J.; Matovu, J.K. “When they know that you are a sex worker, you will be the last person to be treated”: Perceptions and experiences of female sex workers in accessing HIV services in Uganda. *BMC Int. Health Hum. Rights* **2017**, *17*, 11. [[CrossRef](#)] [[PubMed](#)]
43. Suthar, A.B.; Ford, N.; Bachanas, P.J.; Wong, V.J.; Rajan, J.S.; Saltzman, A.K.; Ajose, O.; Fakoya, A.O.; Granich, R.M.; Negussie, E.K. Towards universal voluntary HIV testing and counselling: A systematic review and meta-analysis of community-based approaches. *PLoS Med.* **2013**, *10*, e1001496. [[CrossRef](#)] [[PubMed](#)]
44. Tripathy, J.S.; Singh, A.; Tripathy, D. The Double-Edged Sword of Consecutive and Snowball Sampling: Practical Utility Versus Methodological Compromise. *Indian J. Psychol. Med.* **2026**, *48*, 81–84. [[CrossRef](#)] [[PubMed](#)]
45. Ijaiya, M.A.; Anibi, A.; Abubakar, M.M.; Obanubi, C.; Anjorin, S.; Uthman, O.A. A multilevel analysis of the determinants of HIV testing among men in Sub-Saharan Africa: Evidence from Demographic and Health Surveys across 10 African countries. *PLoS Glob. Public Health* **2024**, *4*, e0003159. [[CrossRef](#)] [[PubMed](#)]
46. Adugna, D.G.; Worku, M.G. HIV testing and associated factors among men (15–64 years) in Eastern Africa: A multilevel analysis using the recent demographic and health survey. *BMC Public Health* **2022**, *22*, 2170. [[CrossRef](#)] [[PubMed](#)]
47. He, J.; Wang, Y.; Du, Z.; Liao, J.; He, N.; Hao, Y. Peer education for HIV prevention among high-risk groups: A systematic review and meta-analysis. *BMC Infect. Dis.* **2020**, *20*, 338. [[CrossRef](#)] [[PubMed](#)]
48. Jiao, K.; Wei, R.; Li, H.; Chow, E.P.; Piqueiras, E.; Lewis, T.; Xu, Z.; Ren, C.; Ma, W. HIV testing frequency and associated factors among five key populations in ten cities of China: A cross-sectional study. *BMC Infect. Dis.* **2022**, *22*, 195. [[CrossRef](#)] [[PubMed](#)]
49. Lin, Y.; Li, C.; Wang, L.; Jiao, K.; Ma, W. The mediated effect of HIV risk perception in the relationship between peer education and HIV testing uptake among three key populations in China. *AIDS Res. Ther.* **2021**, *18*, 8. [[CrossRef](#)] [[PubMed](#)]
50. Global Prevention Coalition; AVAC. *Impact of PEPFAR Stop Work Orders on PrEP*; AVAC: New York, NY, USA, 2025.
51. Lankiewicz, E.; Sharp, A.; Drake, P.; Sherwood, J.; Macharia, B.; Ighodaro, M.; Honermann, B.; Russell, A. Early impacts of the PEPFAR stop-work order: A rapid assessment. *J. Int. AIDS Soc.* **2025**, *28*, e26423. [[CrossRef](#)] [[PubMed](#)]

52. Tram, K.H.; Ratevosian, J.; Beyrer, C. By executive order: The likely deadly consequences associated with a 90-day pause in PEPFAR funding. *J. Int. AIDS Soc.* **2025**, *28*, e26431. [[CrossRef](#)] [[PubMed](#)]
53. Ten Brink, D.; Martin-Hughes, R.; Bowring, A.L.; Wulan, N.; Burke, K.; Tidhar, T.; Dalal, S.; Scott, N. Impact of an international HIV funding crisis on HIV infections and mortality in low-income and middle-income countries: A modelling study. *Lancet HIV* **2025**, *12*, e346–e354. [[CrossRef](#)] [[PubMed](#)]

Disclaimer/Publisher’s Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.