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Co-creation of HIVST Delivery Approaches for Improving Urban Men's Engagement with HIV Services in eThekwini District, KwaZulu-Natal: Nominal Group Technique

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Abstract

Background: HIV self-testing (HIVST) is one of the recommended approaches for HIV testing services, particularly for helping reach populations who would not normally access facility-based HIV testing. HIVST must be tailored to different populations to ensure uptake.

Objective: The main objective of this study was to develop an acceptable HIVST delivery strategy to help improve urban men's engagement with HIV services.

Methods: We invited key stakeholders for urban men's HIV services to participate in a co-creation workshop aimed at developing HIVST delivery approaches for urban men, using eThekwini municipality as a study setting. We conducted purposive sampling to include health care users and health care providers, representing a range of views across the public sector and voluntary sector. We employed the Nominal Group Technique (NGT) method for data collection. The NGT workshop was conducted in two consecutive phases: phase one was focused on determining barriers for men's engagement with the current/facility-based HIV testing services; phase two was aimed at determining HIVST delivery strategies. We used the results of the NGT to design a tailored HIVST strategy for urban men in eThekwini District.

Results: Participants identified the following psychological factors as the most important barriers to uptake of HIV testing services by urban men: stigma, ignorance about the importance of testing and testing process as well as fear of positive test results. Key stakeholders suggested internal motivation strategies as a potentially effective approach to support HIVST delivery strategy. Guided by the NGT results, we designed a HIVST delivery strategy that is supported by a risk communication approach

Conclusion: We designed an evidence-based risk communication mobile health (mHealth) strategy coupled with SARS COV-2 self-testing tailored to improve men's uptake of HIVST. A follow-up study to evaluate the feasibility of implementing these approaches is recommended.

Keywords: Men; Urban; HIV self-testing; Delivery

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Highlights

- There is limited evidence on the strategies to improve uptake of HIV self-testing (HIVST) by urban men
- Strategies recommended to help improve uptake of HIVST by men are as follows:
    - Promotion of HIVST via TV adverts;
    - use of videos for HIVST pre- and post-testing counselling;
    - placing test kits in pubs; promotion of self-testing via social media;
    - provision of free testing kits;
    - internal motivation strategies, respectively
- There is a need to assess the acceptability of the presented strategies for different sub-populations of urban men?

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Background

Across sub-Saharan Africa, men living with HIV are 20% less likely than women living with HIV to know their HIV status [1, 2]. This presents a major public health problem as knowledge of one's status is the first and most important step in the HIV care and treatment cascade [3]. Approximately, 7 700 000 people were living with HIV in South Africa and the rate of new infection remains high [4]. South Africa's HIV programme is the largest in the world and has been making progress towards achieving the Joint United Nations Programme on HIV/AIDS 90-90-90 targets (90% living with HIV know their status, 90% of these on antiretroviral treatment, and 90% with undetectable viral loads) [5]. However, most of the gains in achieving the targets have occurred in females living with HIV, while gains in males living with HIV have been modest [5]. There are substantial gaps in HIV service use and coverage for men and boys in South Africa [6]. There is evidence to suggest that, overall, men have lower levels of engagement and retention in HIV care [7, 8] and higher mortality on ART than women [9]. The observed differences in mortalities may be best explained by background differences in mortality between men and women may be related to other factors including men's poor usage of facility-based health services.

By 2020, at least 400,000 more men in South Africa need to take regular HIV tests and commence treatment to ensure that the country achieves its target of providing treatment to 90% of all men and women testing positive [10]. To reach the 400,000 men in South Africa efforts to create HIV testing services that are tailored to meet men's needs are urgently needed. Community-based HIV testing had a significant effect on reaching a high number of HIV-positive men when compared to facility-based testing [11]. HIVST is one of the WHO recommended approaches for HIV testing services [12], particularly for helping reach populations who would not normally access facility-based HIV testing. For larger-scale dissemination of community-based interventions such as HIVST (HIVST) to be effective, there is a need to understand the processes required to implement the intervention consistently and at a high level of quality, especially implementing the intervention in different contexts [13]. HIV self-tests are available to the public in South Africa and they can be purchased via pharmacy outlets. HIVST provides a novel and currently severely underutilized supplement to facility-based testing [14]. Oral HIVST offers the potential for increased HIV testing uptake and greater convenience and privacy as well as the potential to increase the proportion of the population who test regularly [14]. Evidence on the acceptability of

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HIVST in sub-Saharan Africa has suggested higher acceptability of HIVST among men than women [15].

In general, self-testing offers people a self-management solution - empowers people to be in control of their care. In terms of HIV, a highly stigmatised condition, there are many effective ways to deliver and support HIVST (HIVST), depending on the population and setting [16]. Most HIV-related research on marginalised populations prioritises rural populations as they are often conducted in rural settings. This poses a risk to a delay in addressing the needs of marginalised urban settings. Urbanization is one of the fast-growing global trends of the 21st century. Approximately, 2.5 billion more people will be added to the urban population by 2050, mainly in Africa and Asia [17]. Urbanisation can result in a significant on individual quality of life, while straining public health systems and resources [17, 18]. There is limited evidence on the most appropriate delivery strategies for HIVST to enable urban men to engage with HIV services in South Africa. HIVST has recently been introduced as a supplementary HIV testing strategy in South Africa and recommended to reach the key and under-tested populations [19]. Therefore, it is important to use appropriate delivery strategies to maximize uptake and impact. It is also recommended that relevant stakeholders are involved in developing and adapting HIVST models. The main objective of this study was to collaborate with stakeholders in the development of HIVST delivery approaches to help improve urban men's engagement with HIV services. It is anticipated that the results of this study will help guide a planned intervention study to determine the most acceptable delivery strategy for urban men.

Method

We used the Nominal Group Technique method for this study. We invited key stakeholders for urban men's HIV services such as health care providers, health care service users, government employees, NGOs and academics to participate in a co-creation workshop aimed at developing HIVST delivery approaches for urban men, using eThekwini municipality as a study setting. We purposely sampled our participants. We defined stakeholders as people who have expert knowledge on HIV services, men's health services and have an interest in the implementation of HIVST for men in KwaZulu-Natal, South Africa. During the workshop, we employed the Nominal Group Technique (NGT) method for data collection [20]. The NGT enabled problem identification, solution generation, and decision making among stakeholders. We conducted the workshop in two

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consecutive phases: phase one was focused on determining barriers for men's engagement with the current/facility-based HIV testing services; phase two was aimed at determining HIVST delivery strategies to help improve urban men's engagement with HIV services.

Phase one: We requested key stakeholders to share their knowledge on barriers to urban men's engagement with current (facility-based) HIV testing services. Following instructions from the facilitator, stakeholders independently grouped their suggestions into themes. The PI (TPM-T) listed the themes in a voting form/questionnaire to enable voting through ranking. Participants were requested to rank the themes according to the level of severity in preventing men's engagement with current (facility-based) HIV testing and treatment services. The ranking score was between one and five.

Phase two: Key stakeholders were requested to propose potential HIVST delivery strategies to help improve urban men's engagement with HIV-self-testing and to group them according to themes, without the PI's assistance. The PI listed the themes in a voting form/questionnaire to enable voting through ranking. Participants were requested to rank the themes according to the level of effectiveness to enable the delivery of HIV-self testing to urban men. The ranking score was between one and five, one being least effective and five being most effective strategy.

Following the NGT workshop, a report presenting the results of NGT was put together by the TPMT and shared with key stakeholders for comments.

Data Management and Analysis

To obtain the quantitative data gathered during the ranking step in the nominal group process, a total importance score for each barrier was calculated by summing the individual scores of the participants. The ranking scores were between one and five, one being the least severe, and five being the most severe barrier to urban men accessing HIV self-testing. The qualitative data were analyzed using thematic content analysis to inductively identify the themes that emerged from the data presented during the discussion. The coding categories were derived directly from the text data to limit researcher biases due to preconceived ideas or other theoretical perspectives.

Ethics

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We commenced data collection after obtaining the full ethical clearance from the University of KwaZulu-Natal's Biomedical Research Ethics Committee (Reference No. BREC/0000036/2019), the KwaZulu-Natal Provincial Department of Health (Reference No. HRKM055/18, KZ_201911_013). The exact date when the ethical approval was obtained: 07 November 2019. All study participants signed informed consent before participating in the study.

Results

Eleven HIV key stakeholders aged 18-60 representing different population groups agreed to participate in our workshop. Of these, 73% were male. The majority (64%) of the study participants were employed, two were unemployed and two were full-time students. Characteristics of participants are presented in table 1 below:

Table 1. Characteristics of workshop participants

Gender	Age group (years)	Occupation
Male	56-65	Unemployed
Male	26-40	Health Data specialist
Male	26-40	High School Teacher
Female	41-55	Postdoctoral Student-researching patient-centeredness of HIV services
Male	26-40	Lecturer
Male	18-25	Full-time Undergraduate Student

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Male	41-55	Research Project Director for an international NGO
Male	41-55	HIV services Program Manager
Female	26-40	HIV counsellor
Male	56-65	Former Piping Supervisor, current volunteer HIV mentor and counsellor construction industry employees
Male	18-25	Full-time Masters Student

Stakeholders reported thirteen factors as urban men's barriers to accessing facility-based HIV testing services (Figure 2). The voting results showed that stigma as the most highly ranked barrier (55 scores) followed by ignorance (50 scores), fear, (49 scores) lack of knowledge on the use of HIVST kits (46 scores) and psychology (43 scores), respectively. Lack of incentives (34 scores) was voted as the least severe barrier followed by affordability (35 scores) and health services (38 scores), respectively.

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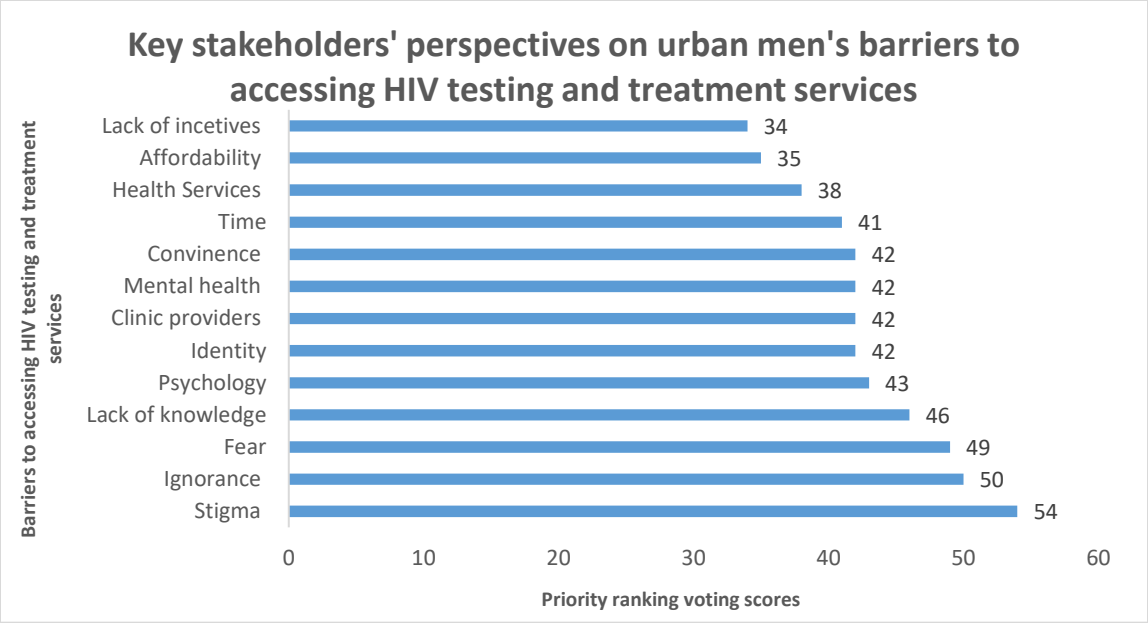

Figure 1. Key stakeholders' voting scores for urban men's barriers to accessing HIV self-testing.

A large proportion (73%) of the participants supported scaling up HIVST to help improve urban men's engagement with HIV testing and treatment services. All eleven participating stakeholders were requested to suggest HIVST delivery strategies and rank them according to their potential effectiveness to help address the above challenges and improve urban men's engagement with HIV services. Figure 3 shows 18 suggested HIVST strategies in ascending order of their ranking score. Key stakeholders ranked the promotion of HIVST via TV adverts as the most desirable (85%) strategy to help enable uptake HIV-self testing and enable urban men's engagement with HIV testing and treatment services, followed by the use of videos for HIVST pre and post-testing counselling (80%), promotion of self-testing via social media (80%), placing test kits in pubs (80%), Internal motivation strategies (80%) and Provision of free testing kits (80%).

Table 3. HIV testing delivery strategies to improve urban men's engagement with HIV testing services

Priority delivery strategies for HIVST	**Summing by votes** *1= less effective 5=highly effective*					**Total number of voting scores (weighted sum = number of votes × ranking score)**
	1	**2**	**3**	**4**	**5**	**55**

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Using celebrities to promote uptake of HIVST	1	1	3	5	1	37
Using endorsement of HIV self-tests by Department of Health	1	1	4	2	3	38
Using sports figures to promote uptake of HIVST		2	3	4	2	39
Providing incentives		2	4	1	4	40
Incorporating mHealth within HIV self- testing		1	4	3	3	41
Partner testing	1		4	1	5	42
Giving men a reason to believe in HIV testing		1	4	2	4	42
Packaging HIVST kits with STI (sexually transmitted disease) self-tests		1	3	4	3	42
Packaging HIV self-tests kits with other diseases screening self-tests		2	2	3	4	42
Providing clear instructions		1	2	5	3	43
Placing test kits in community centres	1	1		5	4	43
Provision of free data	1		1	6	3	43
Provision of free testing kits	**1**		**2**	**3**	**5**	**44**
Internal motivation strategies			**3**	**5**	**3**	**44**
Placing test kits in pubs	**1**	**1**		**4**	**5**	**44**
Promotion of self-testing via social media	**1**		**1**	**5**	**4**	**44**
Use of videos for HIVST pre and -post-testing counselling	**1**			**7**	**3**	**44**
Promotion of self-testing via TV adverts	**1**			**4**	**6**	**47**

Please define all acronyms used in the table below it

Reported barrier versus proposed strategies

Our results show a relationship between the most important barriers to accessing HIV testing and some of the suggested HIVST strategies by stakeholders. The use of internal motivation strategies has been proposed as a strategy that could help address three of the most important barriers to accessing HIVST by urban men - stigma fear and psychology (Table 4).

Table 4: Matching the urban men's barriers to accessing HIV testing services with proposed HIV self-testing delivery strategies

Urban men's barriers to accessing HIV services	HIVST delivery strategies
Stigma	Internal motivation strategies
Lack of knowledge on the use of HIVST	Use of videos for HIVST pre and post-testing counselling

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Ignorance	Promotion of self-testing via TV adverts Promotion of self-testing via social media
Fear	Internal motivation strategies
Psychology	Internal motivation strategies

Please define all acronyms used in the table below it

Concerns relating to scaling up of HIVST

The majority of participating key stakeholders supported the scaling up of HIV self-testing to underserved populations. It is worth noting that some of the stakeholders did not support the scaling up of HIVST to these populations and they raised some concerns. These stakeholders were concerned about HIVST data availability, adequacy of pre and post-testing counselling and patients' reactions to positive test results.

> ***DOH HIV services Program Manager:*** *'The major issue is that usage of the HIV test kits as we cannot have proof of the results. All depend on the client to say whether or not they have used it. No data on how many negative or positive clients use tested and how many confirmed test results. It is hard to get this information, except to say how many self-screening kits were distributed. This is similar to condoms, as we see the number of sexually transmitted diseases increase while the number of condom distribution increases.'*

> ***HIV Counsellor:*** *'We can broadcast a lot of places and strategies for men to access HIVST but what happens when a person is tested without proper counselling, I think we should introduce a lot of information before scaling up HIVST.'*

> **HIV mentor and counsellor construction industry employees*:*** *'I don't believe that self-testing will work because we are going to experience more suicides. There will also be an issue with anger, if he finds out on his own and this could lead to more cases of rape and abuse. This will be the start of a fire that will not be stopped. It's dangerous, I am speaking from a point of view as I am 12 years diagnosed HIV positive and I deal with HIV positive men and women on a daily bases.'*

Feedback from stakeholders and suggestions of priority delivery strategies

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All 11 workshop participants were requested to comment on the proposed approaches to delivering HIVST to urban men. Of these, all read the report and four provided feedback to the report and provided additional suggestions on the implementation of the suggested priority delivery strategies: internal motivation to help encourage; use of videos for HIVST pre and -post-testing counselling; promotion of self-testing via social media; suggested delivery strategies for HIVST for urban men.

Table 2: Suggested HIVST priority strategies

Priority strategy	**Key stakeholder's suggestions**
Internal motivation to help encourage	*"It's can be applied to men to engage in an activity because they like it, make them feel good and helps them to take ownership of their personal life/health. The Department of health may engage to motivate men via workshops, televisions ads and writings on papers (e.g: flyers), school visits may be important too since men engage in physical contacts at young age. Internal motivation may be delivered to men in a form of a story (a person who live with a virus may be a good to share experiences), praises, awards/benefits and recognition."* *"The health professionals that do HIV testing should be males.* *Males should be given an option to choose the gender they pre-order to test them.* *Empathy should be emphasized by the health workers, e.g. I understand your fear, I've also tested etc."* *"To adequately deal with the male's self-esteem/fear related issues prior to him engaging in the self-testing process. This requires therapy/counselling with service providers who are passionate about male sexualities/masculinities/sexual*

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	reproductive health. Additionally the videos or information packs should be person-centred and speak to various levels of emotional intelligences, backgrounds, etc."
Use of videos for HIVST pre and post testing counselling	*"Advocate that HIV self- testing is 100% private and the outcomes of the results are only seen by the self- tester. The self-testing kit should come in a package that has pens, bottles or t-shirts written " I have tested have you??"* *"Through YouTube videos, comprehensively holistic information packs, etc"* *"Cinema ads before the movie stars, urban are engaged in social medias such as face book, WhatsApp and tweeter, self-testing videos maybe posted there by the Department of Health and/or other health organisations."* *"Pre and post counselling videos should be available on YouTube as it is the biggest video platform. The videos should also be available on the department of health website. The self-testing kit should have a link where the videos are available."* *"Data or WIFI opportunities must be available to the person who is considering the self-testing. Videos should be graded incorporating. age, religion, culture, background."*
Promotion of self-testing via social media	*"Internet forum, group chats, group page, etc"* *"Through men's health WhatsApp business account. Facebook pages,*

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	Twitter accounts that are created for self-testing. Each community should create a WhatsApp group that is specifically focused on HIVST that and encourages men to test." *"Community mobilisers, mentor self-testers. Video clips of celebrities promoting self-testing."* *"Male circumcision adverts should include the promotion of self-testing. advertisements should be focused and based on "self -testing is 100% private and confidential" as well as emphasizing where they are available be it public health facilities to stores. As males we tend to see going to the hospital/clinics as something taboo, therefore it will be much more convenient if self-testing kits are not only available in hospitals and clinics."* *"Use men from various background so individuals feel they are represented and can identify with the person/s in the adverts."*

Please define all acronyms used in the table below it

Additional suggestions were provided as part of the feedback to the workshop report to help ensure implementation HIVST to urban men.

> *"Stickers promoting self-testing may be pasted on cars, taxis and trains. Self/ testing kits should available in local stores such as clicks, medirite, pharmacies, Shoprite, spar etc."*

> *"Kits should not be expensive so that even unemployed males, pupils and students can access them. Self-testing kits should also be available in universities and schools."*

Discussion

A collaboration with key stakeholders has enabled collective identification of the most important barriers to accessing current HIV testing and treatment services by urban men and identification

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of priority areas to be considered while developing HIVST delivery approaches for urban men. It has also revealed that psychological factors as the most important barriers to accessing HIV testing and treatment services by urban men. These included stigma, ignorance, fear and lack of knowledge about the risk of contracting HIV. The World Health Organization refers to poor uptake of HIV services by key populations such as men as a "blind spot" in the global HIV response [1]. Key stakeholders suggested the following priority areas be considered during the development of delivery approached for HIVST for urban men: promotion of self-testing via TV adverts; use of videos for HIVST pre- and post-testing counselling; placing test kits in pubs; promotion of self-testing via social media; provision of free testing kits; internal motivation strategies, respectively.

The benefits of promoting health interventions using television as a means to ensure mass communication and raise awareness has been well established in other studies. In Botswana and Zambia television adverts improved uptake of condoms [21, 22]. Television adverts also improved uptake of voluntary counseling and testing in Ethiopia [23]. Key stakeholders also underscored the need for videos for pre- and post- test counselling. HIVST implementation with online video pre- and post- test counselling improved HIV testing coverage and repeated HIV testing among Chinese MSM [24]. In Malawi, Zambia and Zimbabwe placing HIVST kits pubs and beerhalls improved uptake among men. Similar recommendations were made by key stakeholders in our study [25].

SSA as a region remains the fastest growing market for smartphone and internet connectivity. 39% of Africans use mobile internet with an anticipated 10% growth by 2025 [26]. Key stakeholders recommended the promotion of HIVST via social media platforms. This aligns with the findings of a systematic review and meta-analysis that showed social media platforms to improve uptake of HIV services among key populations in LMICs [27]. Given the rapid increase in smartphone access and internet connectivity, social media platforms could be instrumental in improving awareness and ultimately uptake. The provision of free testing kits also emerged as an important component of HIVST delivery strategies that improve uptake. This finding corroborates findings from earlier studies conducted among key stakeholders and health care workers in South Africa [28, 29]. While free provision of test kits it admirable, and likely to result in more coverage, the financial feasibility to support scale-up should also be considered. Ky stakeholders in the current study advocated for internal motivation strategies to improve uptake of HIVST. Internal motivation strategies that improve men have been recommended for South African men in an earlier study [30].

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The collaboration with stakeholders on co-creation of delivery strategies for HIVST for urban men resulted broad range of scenarios around how to support the delivery of HIVST for urban men in KwaZulu-Natal South Africa and other similar settings. Based on the demographics of the stakeholders that participated in this study, we recognise that urban men are not a homogeneous group and that urban environments also have disparities in socioeconomic status. Therefore, in order to eliciting HIVST delivery preferences for different groups of men in preparation for implementation, we propose to conduct a discrete choice experiment (DCE). Bearing in mind the current pandemic and the stigma associated with HIV testing, we recommend the incorporation of SARS COV-2 self-testing to help improve the uptake of HIVST strategies for urban men.

Strengths and limitations of the study

This study included key stakeholders from different populations groups to collaborate in the cocreation of HIVST delivery approach for urban men. As a result, views different groups of urban men were represented in the creation of these approached. Inclusion different key stake holders enabled us to generate a broader range of ideas to support the delivery of HIVST. The NGT limited bias/ domination of one cadre/participant over others through ranking. Despite the above-mentioned strengths, the study had some limitations. The NGT workshop did not include determination of the acceptability of the proposed HIVST approaches in the current context to help prepare for implementation. A follow-up study to determine the acceptability of the suggested delivery strategies is recommended before implementation.

Conclusion

This study provides a unique opportunity for development of strategies to help improve uptake of HIV testing services as part of urban development trends to promotes health in South Africa. Improving the uptake of HIV testing by developing tailored HIVST delivery strategies for underserved population such as urban men is key to reducing new HIV infections.

Contributions: TPM-T conceptualised the study under the supervision of RL and LT; TD assisted with refining the methodology. TPMT and RL conducted data collection; LT, RL and TD critically reviewed the draft of the manuscript. All authors approved the final draft of the manuscript.

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