


BMJ Open Drivers of uptake of HIV testing services, a snapshot of barriers and facilitators among adolescent boys and young men in Lusaka: a qualitative study

Herbert Chabwera Nyirenda ¹, Marksman Foloko,² Carolyn Bolton-Moore,^{2,3} Jaime Vera,⁴ Anjali Sharma²

To cite: Nyirenda HC, Foloko M, Bolton-Moore C, *et al.* Drivers of uptake of HIV testing services, a snapshot of barriers and facilitators among adolescent boys and young men in Lusaka: a qualitative study. *BMJ Open* 2023;**13**:e062928. doi:10.1136/bmjopen-2022-062928

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2022-062928>).

Received 17 November 2022

Accepted 28 August 2023



© Author(s) (or their employer(s)) 2023. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

¹Research, Center for Infectious Disease Research in Zambia, Lusaka, Zambia

²Center for Infectious Disease Research in Zambia, Lusaka, Zambia

³Infectious Disease, University of Alabama at Birmingham, Alabama, Alabama, USA

⁴Sussex Institute, Brighton, UK

Correspondence to

Herbert Chabwera Nyirenda; Herbert.Nyirenda@cidrz.org

ABSTRACT

Background Striking gender and rural–urban disparities highlight the need to redesign HIV services to improve HIV testing and linkage by adolescent boys and young men (ABYM) in sub-Saharan African cities.

Purpose We sought to understand drivers of HIV testing among ABYM living in urban Lusaka in order to design a targeted intervention that may increase their entry into the HIV prevention and treatment cascade.

Methods In May and June 2019, two male moderators conducted three focus group discussions lasting 1.25 hours with seven to nine ABYM per group and six in-depth interviews with healthcare providers (HCPs) working with adolescents. ABYM were conveniently selected from first aid training, sports and youth-friendly sites in three settlement areas. We purposefully selected HCP from community, facility and district levels. Thematic analyses using inductive reasoning were applied.

Results The 24 ABYM were 18–24 years old (median 21 years), single, from 11 different neighbourhoods and 79% had 9–12 years of education. Facilitators of HIV testing uptake included the importance ABYM placed on good health and planning their future in order to fulfil their masculine identity and societal roles. Barriers included peer norms, life-long treatment along with anticipated changes to sexual life and alcohol use, fear of results and judgement and disappointment among HCP. HCPs agreed that masculine roles ('many things to do') and arduous clinical processes deterred ABYM from accessing testing services. They suggested that ABYM were prone to depression which both caused and resulted from behavioural issues such as alcohol use and risk-taking, which prevented uptake of HIV testing services. Both parties agreed that ABYM needed services specifically designed for them and that offered convenient, private, swift and non-judgemental services.

Conclusions ABYM disillusioned by standard counselling procedures, systemic barriers and stigma, avoid HIV test and treat services. Innovative ways and youth-specific spaces are needed to increase access to non-judgemental services that facilitate entry into the HIV prevention and treatment cascade in this population.

BACKGROUND

About 83% of adolescents infected by HIV/AIDS globally in 2013 lived in sub-Saharan

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ We collected data from a diverse group of adolescent boys and young men (ABYM) from different social, cultural and economic contexts, which gave rise to healthy discussion of differing perspectives and experiences of HIV testing uptake in this population.
- ⇒ The study engaged healthcare providers (HCPs) based in both health facility and community settings which revealed their observation of and explanation for low HIV testing uptake among ABYM.
- ⇒ The ABYM and HCWs sample was small and drawn from urban settings. As such, findings may not be relevant to all settings where ABYM are found. However, this qualitative study provides a good snapshot on the study subject with implications for innovations that can increase access to HIV services among ABYM.

Africa (SSA).¹ Reports of the decline in HIV prevalence among adolescents and young people (15–24 years) in SSA, though encouraging, mask increased HIV prevalence among young men. In Zambia, HIV prevalence among adolescent boys and young men (ABYM) increased from 3.7% to 7.3% in urban areas and, from 2.6% to 3.6% in rural areas from 2001 to 2013/2014.^{2,3} While suboptimal across all ages, ABYM aged 15–24 years old had the lowest HIV testing rates in SSA.² In Zambia, only 42% of 15–19 years old reported ever testing for HIV with ABYM half as likely to have ever tested for HIV.⁴ Early detection and linkage are vital to interrupt HIV transmission among young men and to ensure they are part of the Zambian effort to end the HIV epidemic by 2030.

Barriers young people face during conventional HIV testing are well documented.^{5–8} In-person, technology-based interventions such as community-based strategies including HIV self-testing (HIVST), assisted referral and

nominal incentives^{9–11} have shown success in mitigating these barriers, with some promise for HIV education and home-based testing.^{10 12} Technology-based interventions along with HIVST¹¹ remove the need for repeated visits¹³ and mitigate attrition of men and young people¹⁴ from testing programmes. Among young people technology-based interventions including gamification, motivational text messages, technology enabled choice options and use of social media platforms, successfully promote HIV testing.¹⁵ However, the preferences for HIV testing technology and environs remains understudied in Zambia.

Uptake of newer technology-based approaches depend on their fit with existing HIV testing approaches, adolescent and young people's experiences and other contextual factors.¹⁶ We explored the barriers and facilitators to HIV testing among ABYM as the first step of engaging them in the development of HIV testing interventions.¹⁵ Our research questions included those on HIV risk perception among ABYM and their experience with currently available HIV testing strategies and ideal HIV testing environs, which we asked of both ABYM and healthcare providers (HCP).

METHODS

Study design

We conducted an exploratory qualitative study in order to design suitable HIV services that increase both uptake of HIV and linkage services by ABYM in Zambia. Our study design and questions draw on the social constructionist paradigm to understand young people's experiences, the meaning they give to these experiences and how both experiences and meaning are shaped by their sociocultural context.¹⁷

We decided to gather information from a small sample of ABYM and HCPs in urban settings due to our specific purpose: to co-design interventions to improve HIV testing based on emerging insights. We conducted focus group discussions (FGDs) with ABYM to efficiently gather a wide range of views, which is often constructed within social groups and during social interactions among young people. The use of FGDs allowed the capture of group dynamics, facilitating knowledge creation and decision-making processes. We believe that the use of existing groups joined in a common purpose and appropriate choice of research assistants (RAs) matched by sex (male) and youthfulness (early 30s) allowed for easy dialogue with the young men. Recruitment occurred in sports, first aid training and youth-friendly venues, which probably yielded more aware, self-confident and articulate young men from different geographical and socioeconomic groups. This diversity allowed the efficient collection of rich information on perceptions, expectations and experience with HIV testing and care.

We conducted in-depth interviews (IDIs) with HCPs to gather their personal experiences with providing HIV-related services to young people. IDIs allowed HCPs the maximum flexibility to determine time and privacy

settings conducive to free expression including on workplace limitations. While the RAs were relatively younger, their qualitative research experience and respectful mannerisms ensured a professional and authentic engagement.

Patient and public involvement

The public and patients were never involved in study design or management.

Study sites

We conducted our study in Matero and Kalingalinga, which are high-density, mixed income townships in Zambia's capital, Lusaka, situated approximately 6km northwest and 13km east of city centre, respectively. HCPs at the government run Kalingalinga and Matero clinics and ABYM living or accessing first aid training, sport facilities and youth-friendly corners in the clinics' catchment area were our population of interest. Matero clinic serves a population of 94209 people living within its 6.9km² clinical catchment area and Kalingalinga clinic serves a population of 74019 people living within 10.4km².¹⁸ Their youth-friendly corners are private, dedicated spaces located within the clinic where peers volunteer to provide sexual and reproductive health services, products and information to adolescents in their community catchment and nearby areas.¹⁹ Community halls serve many functions including as first training centres for non-governmental organisations while sports facilities are located within the community setting and easily accessed ABYM, who usually congregate there to play football.

Sampling strategy

Using convenience sampling, and with the permission of facility managers, RAs approached young men identified by facility managers as frequenting the study locations and potentially meeting eligibility criteria (age 18–24 years old). The RAs verified the age of those interested in the study against their National Registration Card. Eligible ABYM were invited to an FGD at an agreed on date, time and location. We excluded participants below the age of 18 and above the age of 24 as well as those who were unable/unwilling to give informed consent prior to data collection.

The RAs sought permission from the province, district and facility offices to enter health facilities. With the help of the facility-in-charge, they informed staff regarding the study and invited those involved in HIV testing and antiretroviral therapy (ART) service delivery to ABYM at facility or community level and interested to participate to register with the facility-in-charge. The RAs contacted the HCPs in-person and by telephone for purposes of making and confirming appointments. When given informed consent, the RAs agreed with HCPs on a date, time and location for the discussion/interview.

Data collection

The RAs conducted three FGDs with ABYM and six IDIs with HCPs using a semi-structured guide and in their

preferred language for approximately 90 and 30 min, respectively. The FGD guide included questions on HIV testing and care, experience with HCPs and HIVST as well their ideal testing environs (online supplemental file 1). Inspired by previous HIV and adolescent research, the IDI guides used open-ended questions to elicit more in-depth responses on the experiences of HCPs with HIV testing and care (online supplemental file 2).

All data collection was conducted in private rooms and, with participants' permission, recorded on two audio-recording devices. There was no one else present other than the researchers and participants during interviews and discussions.

Data management and analysis

All participants were allocated a unique identifier number delinked from their name, which was used to label audio-recordings and typed transcripts. Audio recordings and transcripts were securely stored on password-protected computers. Inaudible responses, although minimal, were documented in the transcripts. Signed informed consent forms were stored separately in a locked cabinet.

We analysed the data using thematic analysis based on inductive reasoning.²⁰ An in-country translator transcribed the FGDs and IDIs directly into English in Microsoft Word, which the RAs exported into NVivo software V.12 (QSR International). Using inductive reasoning, HCN, MF and JV conducted open coding and wrote memos to define key concepts and themes. The three analysts examined the initial coding and preliminary themes to identify recurring ideas, views and contexts emerging from both data sets. This helped focus the final analyses on key themes, which were then categorised into facilitators and barriers to HIV testing. AS verified coder concordance. Finally, the team discussed key themes over a 3-day workshop to ascertain information saturation and design questions for co-creation activities.

Regulatory approval and ethical considerations

The National Health Research Authority authorised the research. The Ministry of Health and the National Sports Council gave permission to access their facilities for research purposes. This study adhered to the qualitative research review guidelines Relevance, Appropriateness, Transparency and Soundness (RATS)²¹ and complies with the Standards for Reporting Qualitative Research (online supplemental file 3).

Prior to data collection, RAs gave all potential participants the information sheet which clearly explained purpose, procedures and participant rights. Participants were assured of confidentiality and anonymised data. Identifying information was only collected for administrative purposes and to establish eligibility. FGD participants were advised to share confidential information in private as RAs could not guarantee shared confidentiality. Once the information sheet was read, explained, discussed and clarified, RAs sought participants' informed consent.

Table 1 Socio-demographic data (ABYM, N=24)

ABYM characteristics	n
Age	
18–20	9
21–23	12
24	3
Marital status	
Single	24
Level of education	
Secondary	19
Tertiary	5
Occupation	
Student (college/university)	1
Student (secondary)	4
Employed (informal)	6
Unemployed	13
ABYM, adolescent boys and young men .	

ABYM were reimbursed 100 ZMK (Zambian kwacha) (approximately US\$7) for their travel expenses.

RESULTS

We had a total of 30 respondents, 24 ABYM and 6 HCPs. Three FGDs were conducted with a total of 24 men from 11 different neighbourhoods in Lusaka. All ABYM were 18–24 years old (median age: 21), unmarried, and 79% had completed 9–12 years of education (see table 1). Six IDIs were carried out with HCPs who had 2–30 years (median: 14 years) experience working in the health sector both directly at the health facilities and with health sector cooperating partners.

Below we present the main themes emerging under facilitators and barriers to HIV testing services along with illustrative quotes.

Facilitators of uptake of HIV testing services

Facilitators to uptake of HIV testing included the importance ABYM placed on planning for their future with regards to their health and securing employment as below.

Planning for the future

ABYM thought it important to test regularly to plan for their future. Some ABYM affirmed that knowledge about HIV transmission increased their perceived risk. Some mentioned that HIV could be transmitted through means like 'sharing needles' or 'through birth from our parents', making it 'advisable to test so that you know your status'. They stated that an HIV test was the only way for them to definitively know their HIV status and to accordingly sustain personal health and plan for future prospects. If repetitively ill, an HIV test could help them rule out HIV

or confirm the need for ART which they unanimously agreed they could easily seek.

It is good to test, to know your status ... where you are at a point. You have to take care of yourself because if you do not know whether you are sick or not, the sickness can go beyond your control. (ABYM, Kalingalinga)

If found HIV negative, ABYM said they would continue to take care of themselves and acquire more knowledge on HIV prevention. They thought that testing could further provide a protective measure against diseases like HIV by informing choices around sexual activities, for example, by couples testing:

You have to know your status before you sleep with a woman because you can sometimes sleep with someone who is infected and you are not. So sometimes, before sleeping with [each other], both of you should get tested first ... (ABYM, Kalingalinga)

Future employment prospects

Some ABYM reported that an HIV negative status as a prerequisite for certain jobs. Thus, knowing their HIV status would help them determine their eligibility and motivate them to meet this potential job requirement and increase their employment prospects.

... Youth of nowadays have no chance of getting employment in the government when they are found sick and are HIV positive because they have to get tested once they are offered the job. For example, one cannot be recruited in the military and other institutions. (ABYM, Matero)

These aspirational reasons led one young man to say:

Yes, it is important for a person to test and know their status as a young man in order to know where one stands – it is very important and can even help one to plan for their future... (ABYM, Matero)

Barriers to uptake of HIV testing services

Barriers to HIV test uptake included psychosocial factors such as peer norms, fear of life-long treatment, lifestyle change and of results. Health facility factors included those that left them open to HCP judgement and community stigma while structural factors such as poverty and non-differentiated services impeded access to care.

Fear of a positive result

Treatment expectations and inability to manage their emotions impeded HIV testing by ABYM, who anticipated peers and HCP judgement for accessing HIV services and, disappointment if found HIV positive. They were also concerned about restrictive lifestyle changes that could stop them from doing things they enjoy such as taking alcohol and having sex. They avoided these feelings by

shying away from HIV testing, drawing strength from their peers who advised them to shun the health facility.

Most of the time they could not like get advice from an adult. They would rather ask their friends for advice. So, whatever advice they will get from their friends, that is the one they will take. (ABYM, Kalingalinga)

HCPs agreed that ABYM would rather spend their morning drinking alcohol and smoking than seeking HIV testing services. Some HCPs thought that some ABYM may have these habits due to depression arising from bottled feelings and being naturally secretive. Once intoxicated, their motivation to test for HIV decreased further, fearing HCP reprimand. HCPs thought that this sequence of events perpetuated the cycle of depression, substance use, risk-taking and lack of self-care among some ABYM.

Some ABYM expressed discomfort about returning to health facilities because HCP communicated the need to test after the window period in a manner that instils fear.

... They [should] explain it properly for you [and not] be scaring you after you test by saying things like 'you should come back after 6 months because maybe you have it, but it just isn't showing yet' ... (ABYM, Kalingalinga)

Some ABYM mentioned that they are frightened to test for HIV because they have lost people close to them die after an HIV diagnosis, leaving them traumatised and fearful of dying if diagnosed HIV positive. As such, they would rather not test for HIV.

Structural barriers

According to HCP, most ABYM in high-density areas such as Matero and Kamwala begin to engage in economic activities when young forcing them to choose between income-generation and care seeking at overcrowded facilities with long waiting times. They felt that as ABYM are at an exploratory age, experimenting with a lot of different activities, they disliked spending time in queues.

... There are a lot of long queues, so boys cannot come and stand in the queue for a long time when they are supposed to do a lot of things ... (HCP, Chipata level 1)

Additionally, the HCPs mentioned that ABYM found the processes of HIV testing (needle prick), counselling and diagnosis arduous:

... Most of them do not like to be pricked by the small needle, so they don't like the process at all. Even the process of coming here, counselling, taking time to wait for the results from the lab, they don't want that ... (HCP, Chipata level 1)

The lack of dedicated private spaces and being served by older people only added to the ordeal. ABYM felt uncomfortable being served by older rather than youthful staff when testing for HIV at health facilities. HCPs acknowledged that the lack of dedicated infrastructure and staff

created a barrier to ABYM HIV testing at the health facility, who preferred accessing an HIV test from people their age, at their convenience and for any reasons, without reservation and feeling at risk of being judged.

What I have observed with the adolescents, when they come, they would want a space where its user friendly, where they find people of the same age group to discuss freely ... (HCP, Kamwala)

Lack of tailored testing services

HCPs, both facility and non-facility based, attributed low uptake of HIV testing among ABYM to interventions targeting young women rather than young men.

When you look at the set-up of most health centers you have pediatric services where you have the under-fives, you have MCH services where the women go, then you have the general population which usually caters for adults. So, there is no specific service tailored for adolescent men ... (Professional HCP)

Both HCPs and ABYM felt that services should be tailored to provide ABYM with their desired testing environment, speed and experience along with assurance of confidentiality and protection from the stigma that may come from accessing an HIV test as a young man. They felt that such tailored services would help in improving uptake of HIV testing both at health facilities and in the community among ABYM.

They avoid coming to the facility. Maybe it could be, they don't want to stand in the queues because they don't want to be seen. [For others to know] that they have come to the facility. Or sometimes, they are not free to discuss with anyone about their complaints. (HCP Kamwala)

What would encourage them is to give services to people in places that we are mostly found other than just the hospital like football grounds and bars ... (ABYM Kalingalinga)

ABYM mentioned that they require tailored services that can move them to want to access available HIV testing services.

Nowadays for us youth, you need something that will be attracting youth to come for testing. When you go for ... testing, the one who is in charge makes you feel like you are already HIV positive, and he/she assumes once you know you are HIV positive you will commit suicide and that is a negative approach. (ABYM Kalingalinga)

DISCUSSION

Overall, ABYM thought it important to test for HIV in order to plan ahead and develop coping strategies. However, in the present, they were emotionally ill equipped to manage their treatment expectancies and gave in to peer pressure

to avoid healthcare facilities. Hence, ABYM desired HIV testing services that accorded them privacy, confidentiality and convenience with minimal HCP contact. They sought an environment that allowed them to have access to information and HIV prevention products without being judged. In our study, ABYM and HCPs unanimously felt that community-based interventions tailored for male adolescents would help to reduce stigma and waiting time. Thus, the study highlights the need for alternative approaches to improve access to inclusive services.

ABYM were more concerned about their future health and wealth, possibly driven by gender norms that expect them to work, be busy and experiment with substance use and sexual activities. These notions of masculinity may make them less open to talking about feelings and events and less able to cope with HIV, HIV testing and HIV results as reported by HCPs and ABYM in our study. This view is corroborated by a scoping review detailing how masculine norms could prevent men in SSA from accessing HIV testing.²² However, our findings suggest that this very fear of losing their image as productive, provider and virile and strong, could also motivate ABYM who believed that knowing their HIV status can help them to take actions which can restore their health and allow them to fulfil their societal roles. Our findings lend themselves to the observation that men are interested in health and can be part of the efforts to end the HIV epidemic if health systems adapt to their needs and 'meet men where they are'²³; in our study, this includes providing HIV counselling, HIV testing convenience at locations easily accessible to ABYM and easier access to sexual reproductive health products. Making communities less 'structurally gendered', for example, by providing HIV testing and counselling services in settings convenient to target population such as testing from homes and having age targeted outreach activities focused on HIV prevention and treatment²⁴ and including men over 35 years old²³ could motivate ABYM to follow the footsteps of positive role models.^{25 26}

Attracting ABYM to facilities will take other structural and trust-building changes. Long wait times, loss of privacy, social exposure and long processes possibly along with lack of adequate information and counselling around HIV-related death among family members deterred ABYM in our study from testing for HIV. Such conditions have been known to cause psychological stress and distrust of the healthcare system.^{27 28} The ability of HCPs to give ABYM correct and understandable information as well as provide support, empathy, reassurance and warmth can positively influence ABYMs' cognitive and emotional reactions and ultimately gain their trust.²⁷

Providing community-based HIV testing services in ways that guarantee privacy, confidentiality, convenience and prompt results, without interaction with the health facility and staff, through innovations such as HIVST have proven effective for improving young adults' entry into the HIV care cascade.^{3 9-11} Use of redeemable vouchers to collect HIVST kits from private pharmacies²⁹ and

vending machines to distribute HIV test kits may also increase access³⁰ along with demonstration videos and supervision at first use.¹⁵ Mobile health (mHealth) interventions could address many of the barriers described by facilitating convenient access to testing and prevention services. These innovations require linkage to HIV-related counselling which is adolescent-specific and which addresses shame, concerns about the future and issues of disclosure and leveraging social support. Regardless, the design of such educational material needs to be specific to age and risk groups¹² to hold their attention and motivate them to access models of HIV testing services most suitable for their unique circumstances.

Our study has some limitations. By focusing on ABYM in urban settings, we excluded ABYM living in towns and in rural settings from participation in co-creation and evaluation of any resulting innovation. Additionally, ABYM in congregate settings may have important characteristics, such as being more focused and aspirational, as well as pursuing sports or other self-improvement activities, which shape their perspectives and priorities in relation to HIV testing services. More socially isolated ABYM and those living in towns and rural settings likely have different concerns and preferences. Their voices and experiences should be considered in the design of interventions to ensure inclusivity and effectiveness. These limitations restrict the application of our findings to a broader population of ABYM. Despite these limitations, our findings highlight anxieties around HIV testing among ABYM, even within this potentially more emancipated group. This suggests that discrete options for HIVST along with facilitated linkage to care may be of service to ABYM in different settings in Lusaka, Zambia.

Conclusion

The challenge of adolescents testing particularly among ABYM remains prominent in the fight against HIV in Zambia. Interventions to increase HIV testing rates among ABYM must meet their desire for a stigma free testing environment, men-specific services in community and youth appropriate areas and age-matched counselors. More research is needed on strategies to address the fear of losing masculinity and societal roles associated with HIV testing while still motivating ABYM to know their HIV status; what young men would consider private and convenient delivery systems; and preferences for linkage to care for ABYM with a reactive HIVST result. Discrete choice experiments³¹ and Trials of Improved Practice can further help delineate how to tailor HIVST initiatives to the age and risk-groups among ABYM to increase their engagement with testing services.

Contributors AS, CB-M and JV conceived the study topic and wrote the study proposal for execution of the study. Planning, study design and location for this study was done by AS, CB-M and JV. The conduct of the study was done by AS who supervised and guided HCN and MF in data collection. AS, HCN, MF and JV conducted data analysis and reporting of the collected data. The interpretation of findings was done by AS, HCN, MF and JV. The writing of the manuscript was done

by HCN and AS while review was done by AS, CB-M, JV and MF for both abstract and manuscript. The content guarantor for this work is AS.

Funding The study was funded by the University of Brighton.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval This study involves human participants and was approved by The University of Zambia Biomedical Research Ethics Committee (UNZABREC) approved this study. Reference number 001-10-18. Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available upon reasonable request.

Supplemental material This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

ORCID iD

Herbert Chabwera Nyirenda <http://orcid.org/0000-0003-0359-9058>

REFERENCES

- Available: https://www.unaids.org/sites/default/files/media_asset/20150217_ALL_IN_brochure.pdf [Accessed Jul 2021].
- Asaolu IO, Gunn JK, Center KE, *et al.* Predictors of HIV testing among youth in sub-Saharan Africa: A cross-sectional study. *PLoS One* 2016;11:e0164052.
- Nakazwe C, Michelo C, Sandoy IF, *et al.* Contrasting HIV prevalence trends among young women and men in Zambia in the past 12 years: data from demographic and health surveys 2002-2014. *BMC Infect Dis* 2019;19:432.
- Mwaba K, Mannell J, Burgess R, *et al.* Uptake of HIV testing among 15-19-year-old adolescents in Zambia. *AIDS Care* 2020;32:183-92.
- Sam-Agudu NA, Folayan MO, Ezeanolue EE. Seeking wider access to HIV testing for adolescents in sub-Saharan Africa. *Pediatr Res* 2016;79:838-45.
- UNAIDS. Seizing the moment: tackling entrenched inequalities to end epidemic. 2020.
- St Clair-Sullivan N, Mwamba C, Whetham J, *et al.* Barriers to HIV care and adherence for young people living with HIV in Zambia and Mhealth. *Mhealth* 2019;5:45.
- Katirayi L, Akuno J, Kulukulu B, *et al.* "when you have A high life, and you like sex, you will be afraid": A qualitative evaluation of adolescents' decision to test for HIV in Zambia and Kenya using the health belief model". *BMC Public Health* 2021;21:398.
- Mavegam BO, Pharr JR, Cruz P, *et al.* Effective interventions to improve young adults' linkage to HIV care in sub-Saharan Africa: A systematic review. *AIDS Care* 2017;29:1198-204.
- Chikwari CD, Dringus S, Ferrand RA. Barriers to, and emerging strategies for, HIV testing among adolescents in sub-Saharan Africa. *Curr Opin HIV AIDS* 2018;13:257-64.
- Hatzold K, Gudukeya S, Mutseta MN, *et al.* HIV self-testing: breaking the barriers to uptake of testing among men and adolescents in sub-Saharan Africa, experiences from STAR demonstration projects in Malawi, Zambia and Zimbabwe. *J Int AIDS Soc* 2019;22 Suppl 1(Suppl 1):e25244.
- Hlongwa M, Mashamba-Thompson T, Makhunga S, *et al.* Mapping evidence of intervention strategies to improving men's uptake to HIV testing services in sub-Saharan Africa: A systematic Scoping review. *BMC Infect Dis* 2019;19:496.

- 13 Shanaube K, Schaap A, Floyd S, *et al.* What works—reaching universal HIV testing: lessons from HPTN 071 (Popart) trial in Zambia. *AIDS* 2017;31:1555–64.
- 14 Floyd S, Shanaube K, Yang B, *et al.* HIV testing and treatment coverage achieved after 4 years across 14 urban and peri-urban communities in Zambia and South Africa: an analysis of findings from the HPTN 071 (Popart). *PLoS Med* 2020;17:e1003067.
- 15 Horvath KJ, Walker T, Mireles L, *et al.* A systematic review of technology-assisted HIV testing interventions. *Curr HIV/AIDS Rep* 2020;17:269–80.
- 16 Zuma T, Seeley J, Sibiyi LO, *et al.* The changing landscape of diverse HIV treatment and prevention interventions: experiences and perceptions of adolescents and young adults in rural KwaZulu-natal, South Africa. *Front Public Health* 2019;7:336.
- 17 Santos J. 2015 social construction theory. BMJ Books; 2015. Available: <https://onlinelibrary.wiley.com/doi/abs/10.1002/9781118896877.wbiehs488>
- 18 MOH. The 2012 list of health facilities in Zambia preliminary report (draft No.15). The 2012 list of health facilities in Zambia; 2013.
- 19 Available: <https://www.ipas.org/news/the-youth-friendly-corner-where-all-young-people-find-safe-respectful-health-care/>
- 20 Clarke V, Braun V. 2014 thematic analysis. In: *Encyclopedia of Critical Psychology*. New York, NY: Springer, 2014: 1947–52.
- 21 Clark J. *How to Peer Review a Qualitative Manuscript*. *Peer Review in Health Sciences* Second edition. BMJ Books, 2003: 219–35.
- 22 Sileo KM, Fielding-Miller R, Dworkin SL, *et al.* What role do masculine norms play in men's HIV testing in sub-Saharan Africa?: A Scoping review. *AIDS Behav* 2018;22:2468–79.
- 23 Grimsrud A, Ameyan W, Ayieko J, *et al.* “Shifting the narrative: from “the missing men” to “We are missing the men”. *J Int AIDS Soc* 2020;23 Suppl 2(Suppl 2):e25526.
- 24 Sarkar S, Corso P, Ebrahim-Zadeh S, *et al.* Cost-effectiveness of HIV prevention interventions in sub-Saharan Africa: A systematic review. *EClinicalMedicine* 2019;10:10–31.
- 25 Galavotti C, Pappas-DeLuca KA, Lansky A. Modeling and reinforcement to combat HIV: the MARCH approach to behavior change. *Am J Public Health* 2001;91:1602–7.
- 26 Available: <https://whatworksinyouthhiv.org/strategies/evidence-based-interventions/project-aim-adult-identity-mentoring> [Accessed Jun 2021].
- 27 Petrocchi S, Iannello P, Lecciso F, *et al.* Interpersonal trust in doctor-patient relation: evidence from Dyadic analysis and association with quality of Dyadic communication. *Soc Sci Med* 2019;235:112391.
- 28 Toft T, Alfnsson S, Hovén E, *et al.* Feeling excluded and not having anyone to talk to: qualitative study of interpersonal relationships following a cancer diagnosis in a Sibling. *Eur J Oncol Nurs* 2019;42:76–81.
- 29 Marlin RW, Young SD, Bristow CC, *et al.* Piloting an HIV self-test kit voucher program to raise Serostatus awareness of high-risk African Americans, Los Angeles. *BMC Public Health* 2014;14:1226.
- 30 Topolewska-Siedzik E, Ciecuch J. Trajectories of identity formation modes and their personality context in adolescence. *J Youth Adolesc* 2018;47:775–92.
- 31 Wang Y, Wang Z, Wang Z, *et al.* Application of discrete choice experiment in health care: A Bibliometric analysis. *Front Public Health* 2021;9:673698.