

Alcohol and other drug use among HIV-affected adolescents and young adults in Zambia: a qualitative study of multilevel drivers and preferences for prevention and treatment approaches

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ABSTRACT

Background: Alcohol and other drug (AOD) use is a growing public health problem among AYA and young adults (AYA) globally. AYA who are affected by HIV in low-and-middle-income countries (LMICs) may have high risk for AOD use problems, yet the context of AOD use remains an understudied area in this population.

Methodology: In this qualitative study, we conducted 16 focus group discussions with HIV-affected AYA (ages 16–24), caregivers, and healthcare workers, and eight key informant interviews with mental health experts in Lusaka, Zambia. Thematic analysis with open coding explored multi-level determinants of AOD use among HIV-affected AYA, as well as perceptions of intervention approaches.

Results: The study included N = 40 AYA, N = 50 caregivers, N = 40 lay healthcare workers, and M = 41 professional healthcare workers. Substance use among AYA was commonly initiated as a coping mechanism for trauma and perpetuated by withdrawal symptoms. Perceived benefits included enhanced cognitive (boys) or sexual (girls) performance. Interpersonal factors, including peer pressure, bullying, and lack of family support contributed to initiation and continuation of use. Structurally, limited access to recreational facilities, poverty, unemployment, and widespread availability of inexpensive substances facilitated use. At the health system level, the absence of standardized treatment guidelines, insufficient AYA-specific services, and pervasive stigma surrounding AOD care impeded access to services. Current prevention efforts were seen as limited by targeting HIV alone, having limited accessibility, and favoring girls in implementation.

Conclusion: Findings underscore the need for integrated HIV and AOD services, gender-responsive and trauma-informed interventions, and structural approaches addressing youth unemployment and service accessibility.

1. Introduction

Alcohol and other drug (AOD) use disorders are a major global concern, contributing to over 130 million disability-adjusted life-years (DALYs) (Degenhardt et al., 2018). AYA and young adults (AYA) are particularly vulnerable, having the highest initiation and past-year prevalence of substance use disorder rates compared to all other age

groups (UNODC, 2018). Though AOD use has been a growing problem among AYA in low-and-middle-income countries (LMICs) (de la Torre-Luque et al., 2021), including in sub-Saharan Africa (Ebrahim et al., 2024; Maila, 2025), this trend has received limited attention compared to high-income countries.

AOD use poses unique and significant risks among HIV-affected AYA, which includes AYA living with HIV, orphaned by HIV, living with

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someone who is HIV positive, or at elevated risk for HIV infection (PEPFAR, 2012). There is a well-documented link between substance use and HIV risk behaviors among AYA (Bedoya et al., 2012; Kalichman et al., 2008; UNAIDS, 2014; Wolfe et al., 2010). This issue is particularly urgent in Africa, where two thirds of AYA living with HIV reside (Armstrong-Mensah et al., 2021). Clinical studies consistently indicate that drug use may increase risk behaviors for HIV, accelerate disease progression, and decrease adherence to antiretroviral therapy, leading to poor treatment outcomes (Azar et al., 2010; Carrico, 2011; Williams et al., 2016). Moreover, harmful interactions between alcohol and ART may aggravate health risks of people with HIV and lead to hepatotoxicity, liver disease, and exacerbated peripheral neuropathic pain (Barve et al., 2010; Ferrari and Levine, 2010).

Less than 15% of HIV-affected AYA receive any form of AOD treatment (Semrau et al., 2015). This treatment gap contributes to a significant disparity; the DALYs attributable to substance use are 2.5 times higher in Africa compared to high-income countries (Jumbe et al., 2021; Whiteford et al., 2013). In Zambia, the location of the current study, unhealthy alcohol use is common among young adults living with HIV and associated with reduced odds of viral suppression (Vinikoor et al., 2022). Despite these risks, there is a significant gap in the detection and care of AOD use among HIV-affected AYA. To date, only one study has examined AOD-related risk factors among street-connected youth in Zambia (Tyler et al., 2016), and no study has provided a deeper exploration of the context, motivations, and patterns of AOD use among HIV-affected AYA more broadly.

Most studies examining the relationship between substance use and the HIV care continuum have been largely quantitative in design (Kuchinad et al., 2016), failing to capture the complex social, cultural, and health system factors that influence AOD use behaviors. Yet evidence indicates that culturally adapted, context specific interventions are frequently more effective than generic interventions in reducing AOD use and improving the outcomes for target groups (Burlew et al., 2013; Smith et al., 2011).

AOD use behaviors are deeply shaped by local norms, traditions, and lived experiences. As such, qualitative research is essential to explore the 'how, what, when, where, and why' AYA use AODs and to capture their perspectives on prevention and treatment. These factors are critical in developing, adapting, and implementing AOD prevention and treatment approaches within HIV programs. Additionally, incorporating perceptions on acceptability and feasibility of AOD screening and intervention programs among stakeholders such as AYA, their caregivers, HIV care workers, counselors, and policymakers are important to ensure that services are relevant, effective, and scalable. Input from these stakeholders can facilitate successful integration of AOD services within existing HIV prevention and treatment programming.

In this qualitative study in Lusaka, Zambia, we sought to establish a foundation for future epidemiologic, intervention and implementation research that is informed by AYA and other stakeholders. We aimed to:

- Examine the context of AOD use among both male and female AYA (ages 16-24) and caregivers of AYA
- Explore the perceptions of AOD screening and intervention (prevention and treatment) approaches among AYA.

Findings from this study will be used to inform the development of contextually appropriate AOD screening and treatment interventions for this population within HIV prevention and treatment services.

2. Methods

2.1. Overview of study design

This qualitative study was conducted in four high-density, low socioeconomic communities in Lusaka, Zambia known to have high prevalence of AYA AOD use. These neighborhoods (known locally as

"compounds") are where most AYA in Lusaka reside and they have poor access to safe water and sanitation.

We employed focus group discussions (FGDs) and key informant interviews (KIIs) to conduct an in-depth exploration of various stakeholders' perceptions and experiences on AOD use among Zambian AYA. The participants included: AYA, caregivers, lay healthcare workers and professional mental health experts working for the Ministry of Health and private organizations.

2.1.1. Statement on positionality

The researchers that conducted the data collection (MF, KM) and data analysis (CM, TK) were Zambian researchers with prior knowledge on HIV programs and substance use challenges in Lusaka and were closely familiar with the local language and context. This provided a cultural understanding in interpreting the codes and themes. However, this may have led to risk of confirmation bias and assumptions based on prior knowledge. To mitigate this, the analysis was conducted in collaboration with a third coder (AP-A) based in the U.S. who was experienced in qualitative mental health research in other low-income settings. Her etic perspective challenged the two coders (TK, CM) interpretations, which promoted a deeper exploration of the data and moved beyond analysis to more critical and theoretically informed findings. All three coders maintained reflective journaling with regular debriefing. This collaborative process allowed us to leverage our distinct positionalities as complementary strengths, enhancing the trustworthiness and rigor of the study.

2.2. Sampling and participants

The implementing organization for this research study was the Centre for Infectious Disease Research in Zambia (CIDRZ), a globally recognized organization that provides HIV prevention and treatment services in Zambia and engages in research. CIDRZ has ongoing partnerships in the Lusaka community with home-based care workers (HBCWs) who provide outreach services to families affected by HIV, such as psychoeducation and reminders about HIV care appointments and pharmacy visits. CIDRZ also administers the *Youth Friendly Spaces* program, which has spaces within HIV programming efforts and is operated by trained peer educators who offer different AYA health services. The spaces provide AYA with access to comprehensive HIV services such as HIV testing and Pre-exposure prophylaxis (PrEP).

We asked HBCWs and staff working at HIV prevention and treatment programs to identify AYA and caregivers who were part of their regular programming and believe meet eligibility criteria. Using a recruitment script, the staff members introduced the study to AYA and caregivers. If the AYA or caregiver indicated interest in participating in the study, the HBCW/program staff member connected them to our study research assistant, who then explained the study in full and obtained informed consent. AYA were eligible if they were between 16 and 24 years of age and HIV-affected, defined as being under the care of a partnering HIV-focused organization or involved in CIDRZ AYA HIV prevention and treatment programs (we did not ask AYA direct questions about HIV during screening). All adolescents were recruited from the clinic setting. Caregivers were eligible if they were 18 years of age or older and the caregiver of an HIV-affected AYA. There was no requirement that AYA also have their caregivers participate in the study; likewise, there was no requirement that caregivers have an AYA participate in the study; consent processes and focus group discussions were done separately between AYA and caregivers.

Healthcare worker participants included HIV clinic/program staff, peer educators/lay counselors, and mental health professionals. We purposively sampled healthcare workers and lay counsellors working in HIV clinics at four high volume healthcare facilities in Lusaka with high burden of substance use among adolescents. The professional and lay health workers were eligible if they were a) 18 years and above, b) Residing in Lusaka, Zambia, and c) Working at the HIV clinic that serves

AYA. They were ineligible if they were unable or unwilling to provide informed consent. A study RA connected with these participants through the facility-in-charge and informed them about the qualitative study. Those willing to participate were taken through the consenting process before data collection. Due to CIDRZ ongoing work with the Zambia Ministry of Health, we had an existing list of mental health professionals who were asked to participate in key informant interviews (KIIs).

2.3. Data collection

Data were collected through FGDs and key informant interviews (KIIs) at community health facilities and private spaces. Two research assistants with six years of experience in qualitative research and fluent in English and the local languages (Bemba and Nyanja) collected the data. Prior to data collection, the qualitative research assistants received training on the study protocol and all data collection instruments. All FGDs conducted with health care professionals, lay health workers, caregivers and adolescents were held in a private room within the health facility to ensure confidentiality. The private room was typically used for facility meetings and was specifically chosen to provide a neutral and private environment conducive to open dialogue. The average time for KIIs was 45 min and 90 min for FGDs.

The participants in the FGDs consisted of AYA, caregivers, and healthcare workers. Separate FGDs were conducted for each participant type. Semi-structured FGD guides, which are included as supplemental files, were used to collect data on the participants' perceptions of AOD use among Zambian AYA (e.g., types and patterns of drug use, context of use, and motivations for use) and the availability and accessibility of AOD use treatment programs. We conducted 16 FGDs in total, four each with AYA, caregivers, peer educators/lay counselors, and healthcare professionals, with a total of 10-11 participants per FGD to encourage full participation among the groups. Semi-structured FGD guides (See supplemental files), were used to collect data on the participants' perceptions of AOD use among Zambian AYA (e.g., types and patterns of drug use, context of use, and motivations for use) and the availability and accessibility of AOD use treatment programs. The FGDs were audio-recorded with the permission of the participants and transcribed verbatim for analysis.

The study coordinator facilitated eight key informant interviews (KIIs) with government representatives and non-governmental organizations working towards providing services or treatment for AYA mental health in Zambia. She used a semi-structured KII guide to collect information in English on the state of AOD use in Zambia and the availability and accessibility of AOD use treatment programs. The KIIs were audio-recorded with the permission of the participants and transcribed verbatim for analysis.

2.4. Data analysis

We conducted thematic analysis using an inductive approach to explore the patterns of AOD use among AYA in Zambia, as well as their perceptions of intervention approaches. The initial analysis used line by line coding to allow for concepts and categories to emerge from the data. The three coders first read and reviewed a subset of the transcripts to become familiar with the content. During open coding, transcripts were broken down into discrete segments and concepts labeled using descriptive codes. The coding team had expertise in qualitative research, public health, and primary care and intervention/implementation research. Two of the coders are closely familiar with the local language, culture and context. Through interactive team discussions among the coders, categories were defined and organized into a structured coding framework. The codebook was piloted and revised until consistent application and inter-coder reliability was established. Discrepancies were resolved through group discussions. A fourth team member helped to solve differences when required by the analysis team. Data saturation was assessed throughout data collection. After each FGD, the qualitative

analysts reviewed the memos and transcripts with the study coordinator to discuss any new patterns emerging. We determined saturation had been reached when subsequent focus groups and data analysis among the three coders no longer produced new codes, categories, or themes.

The thematic analysis involved a thorough examination of the transcripts that were gathered from the FGDs and KIIs. To gain a comprehensive understanding of the data, the researchers read and re-read the transcripts. This process allowed them to become familiar with the content and to identify emerging patterns. Transcripts were imported and coded using NVivo software (QSR International Pty Ltd, 2012). The team engaged in participatory and collaborative analysis, meeting on a weekly basis to generate thematic summaries and illustrative quotations. Analysts collectively reviewed themes to ensure coherence and depth of interpretation. The emergent themes were later mapped onto domains of the social ecological framework. This allowed us to examine the individual, interpersonal, community and structural factors that shaped AOD use.

2.5. Social ecological framework

We used the social ecological framework (Baral et al., 2013; Wold and Mittelman, 2018) to organize the results across all participant types (Fig. 1). The social ecological model is a theory-based framework for understanding the interactive effects of both personal and environmental factors on behavior, taking into account the individual, interpersonal, health system level, and structural factors. The model illustrates how factors at one level affect factors at another level, leading to the design of multi-faceted interventions that go beyond the individual. *At the individual level*, we examined the personal characteristics, beliefs, and attitudes of AYA towards AOD use, as well as their experiences and motivations for using AODs. *At the interpersonal level*, we explored the influence of family, peers, and other social networks on AYA AOD use behaviors. *At the community level*, we explored the influence of culture, social and physical environments on AYA AOD use behaviors. *At the policy/structural level*, we explored the influence of the health system, programs and policies on AYA behaviors. By employing social ecological theory, we were able to explore the complex interplay between these different levels of influence on AYA AOD use. This allowed us to develop a more comprehensive understanding of the patterns of use and perceptions of intervention approaches among the study participants.

2.6. Ethical approvals and informed consent

The study obtained ethical approval from the University of Zambia Biomedical Research Ethics Committee (UNZABREC), the Zambia National Health Research Authority (NHRA) and the Columbia University Medical Center IRB.

For all participant types, informed consent (assent for participants aged 16-17) was obtained by CIDRZ research assistants, who successfully completed appropriate human subjects training and certificates. Informed consent procedures were conducted within a private space in CIDRZ offices or clinics, or a private space within a community location where HBCWs and Youth Friendly Spaces programming occurs. The informed consent process presented key information about the research study, including purpose, locations where research activities were to be conducted, assessment length and topics, permission to audio-record interviews/FGDs, incentives for participation, potential risks and benefits, and participant's rights. The consent forms for all participants were available in English; for AYA and caregivers, consent forms were also available in two common Zambian languages (Bemba and Nyanja) and consent was conducted in the language chosen by the participant. Study procedures allowed for potential participants to take time to make a decision about whether or not to participate and a follow-up appointment within 48 h of the initial meeting was scheduled, if needed. The participants had an opportunity to discuss information and were

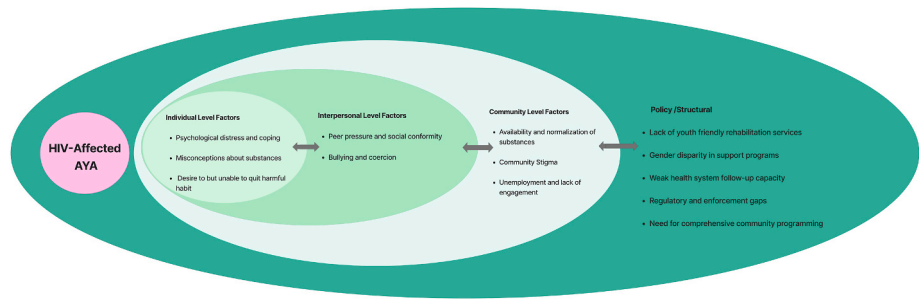


Fig. 1. Conceptual model.

encouraged to ask questions throughout the consent process and also throughout their entire participation in the study. As with previous studies we have conducted in Zambia, due to sensitivity in signing documents, we obtained verbal informed consent from participants with the research assistant signing on behalf of the participant.

Given that substance use among AYA is a stigmatized issue in Lusaka, and to facilitate participation of participants in the whole age range, we requested and received from all IRB's a waiver of parental/caregiver permission for AYA aged 16 and 17 years for the following reasons: 1) the research was considered low risk, only involving an interview or focus group, about the context and perceptions of substance use; 2) requiring parental consent could prevent study participation, particularly of AYA who may have had personal experiences with substance use. Although we did not perform substance use screening nor did we ask for personal experiences AYA had with their own substance use, we wanted to avoid excluding participants who may provide useful information regarding the study questions; 3) getting rich and detailed information from young people in the community may have been difficult without the waiver of parents' consent. If we had required parental consent, some AYA could have participated to agree with their parents, which could lead to less accurate data from AYA. On the other hand, some AYA could have decided not to participate due to fear of loss of privacy about information shared during the study; 4) AYA were being recruited in part from ongoing CIDRZ Youth Friendly Spaces programming in Zambia, which provided services to AYA for sexual and reproductive health. Requiring caregiver permission could have disclosed the use of these services by AYA.

Focus group discussions were purposefully designed to not ask AYA participants direct questions about their own possible substance use. However, emotional distress was still possible by the general discussion of sensitive topics like substance use and psychosocial problems among AYA. Research assistants were trained to identify distress among participants, respond in a supportive manner, and provide them with additional resources. This included referral to a counselor or mental health professional, if warranted (no referrals were necessary during the study). We had highly trained counselors onsite during all study procedures.

Participants were provided with a light snack and drink during the interview or focus group. Participants were also reimbursed with 100ZMW (approximately \$4.50) towards any costs incurred due to participation. The introduction of the study and the informed consent process made clear that participation was completely voluntary and participating or not had no bearing whatsoever on the AYA or caregiver continuing to receive their usual services.

2.7. Research partnership

This study was conducted through a longstanding (10+ year) collaboration between investigators in Zambia and the United States. Study aims and methods were co-developed by Zambian and U.S.-based investigators. Data collection was conducted and supervised by Zambian research staff. Thematic analysis was undertaken by three team

members, two of whom were Zambian, with iterative discussions to ensure contextual grounding and analytic rigor. Shared first authorship between U.S. and Zambian investigators reflects shared intellectual leadership across institutions. The partnership includes ongoing mentorship and capacity strengthening in qualitative methods and manuscript development, consistent with best practices for equitable global health research collaboration.

3. Results

The study included N = 40 AYA participants (68% male; 32% female), N = 50 caregiver participants (20% male; 80% female), N = 40 lay healthcare workers (40% male; 60% female), N = 7 key informant policy makers and mental health professionals (14% female; 85% male) and M = 41 professional healthcare workers (17% male; 83% female) (Table 1).

Our socio-ecological framework depicts the multi-level drivers and risk factors related to AOD use in Zambia on four main levels: the individual, interpersonal, community and policy/structural levels. Each of these levels must be acknowledged to develop effective interventions to reduce the burden of AOD use in the country.

3.1. Multilevel drivers of AOD use

3.1.1. Individual level factors

Psychological distress and coping. AYA frequently turned to AOD use in response to traumatic life events such as the loss of parents or guardians, discovery of their HIV-positive status, or experiences of abuse and neglect. Lacking emotional support and healthy coping mechanisms, many AYA began AOD use at a young age to manage overwhelming grief, anxiety, and hopelessness. These substances offered a temporary escape from psychological distress but often led to long-term dependence (Ex 1, Table 2). Traumatic life events that young people may experience have the potential for them to turn to AODs to deal with the pain.

Misconceptions about substances. AOD use among AYA was also driven by perceived functional benefits. Male AYA often preferred substances they believed enhanced physical strength, academic performance, and sexual prowess. These included locally available marijuana,

Table 1
Study participants.

	N	Gender n (%)
Adolescents and young adults	40	Male = 27 (68%) Female = 13 (32%)
Caregivers	50	Male = 10 (20%) Female = 40 (80%)
Lay healthcare workers	40	Male = 16 (40%) Female = 24 (60%)
Key informants	7	Male = 6 (86%) Female = 1 (14%)
Professional health care workers	41	Male= (17%) Female 34 (83%)

Table 2

Socioecological level, themes and illustrative statements.

Theme	Data source	Example	Illustrative Statement
Individual-level factors			
Psychological distress and coping	Focus group discussions	Ex.1	AB: “The reason why I started taking alcohol is that I had lost my dad, my mum and even my sister and we were just two of us in the family, my sister and I and so am all alone now. I grew up with my father's young brother, though I call him dad. He would hit you with whatever is near, without a care in the world of the nature of the object ... One day I escaped from home while he was hitting me I started asking about my friends and some of them then advised me to go to a certain friend as he lived alone. These guys were drinking beer and even smoking weed but none the less they welcomed me. So, I explained to them what had happened to which they said, we know of such pressures that you are going through but here, take a puff of this. I asked them what that would do and they said it will calm your nerves and make me forget about my problems. I did not realize that the more I indulged, the more addicted I got and soon my consumption changed, from 1 bottle to two then it gradually increased and I became somewhat a drunkard.”
Misconceptions about substances	Focus group discussions	Ex 2	AB: I am speaking from experience because I remember when I was doing grade 12, we believed that when you smoke especially marijuana or weed you thinking capacity will be stimulated and they will be very brainy” . AB: “There's this myth to say especially marijuana or weed that when you smoke it you will be very intelligent and it's a trend now especially these high schools its a lot of people that smoke marijuana because they feel like when they smoke their thinking capacity will be stimulated and I will be very brainy.” AB: “I think for ‘Nsunko’ for women they take it they think a man will feel better when they use that same ‘Nsunko’ and the man will feel warm feel warm. Or maybe that feeling of like into a job now. Yeah, I think that's a reason why women get Nsunko.”
Desire to but unable to quit harmful habit		Ex 3	AB: “Because at this stage we are, am sure all of us wished that they could stop whatever it is that we do. We all have that desire to stop but we just fail to do so.”

Table 2 (continued)

Theme	Data source	Example	Illustrative Statement
Interpersonal-level Factors			AB: “These things are just harming our lives. It was a mistake. All this was a mistake and at the time we thought this was the way to go but it was a mistake and at this point we now are, we cannot turn back the hands of time because it's too late”.
Peer pressure and social conformity	Focus group discussions	Ex 4	AB: “Influence from peers comes in because they're not doing anything they feel. I think I will be a laughingstock if I am not participating on what my friends are doing and there's nothing literally that I am doing and it's just better that I participate. So, I think influence from friends plays a role.” AB: “In a group of six then you find that everyone drinks and you don't there is a word that they use which is “kembo” which means like you are not happening, there is nothing that you know on earth ... So when they say you are a “kembo” which means you don't know anything yeah so you will find that your friends are getting drunk and you are just seated they will say you are a spencer (snitch) maybe you want to bring December here December means DEC (DEC-Drug Enforcement Commission) so you need to smoke or drink so that they know that you are not a snitch”. CG: “And this is the age group between 16 - 24, So while others are school dropouts and others don't work. So It is just peer pressure they just want to fit in with their friends. So you find that some of these children that may even be coming from well to do families. Just want to be accepted by their friends They feel that if they don't accept to smoke they may be rejected by their friends, and for others They are just frustrated with life so they feel comforted by the drinking alcohol and when their situation don't change they continue going back to alcohol.” (Caregiver, Female) HW: “There are many reasons of course, but the some of the reasons that we have known one is peer pressure, that there are these youngsters who would normally join the drinking spree because they feel that drinking in school or drug use is cool. That is what they have learnt. And that's what the other friends have told them.

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Table 2 (continued)

Theme	Data source	Example	Illustrative Statement
Bullying and coercion	Focus group discussion	Ex 5	<i>So peer pressure is one of them.” (Key Informant, Male)</i> FCG: “Adolescents are just bullied, they are clean when going to school but when they meet the same adolescents into drugs, they are beaten and told that if you do not join in taking marijuana we will continue beating you. So in fear of being beaten, the child will just join and start smoking”. FCG: “Adolescents are just bullied, they are clean when going to school but when they meet the same adolescents into drugs, they are beaten and told that if you do not join in taking marijuana we will continue beating you. So in fear of being beaten, the child will just join and start smoking”.
Gender norms in substance use	Focus group discussion	E	AG: “There’s a belief these days that it tightens your vagina so most adolescent girls use it in a preference of saying no my boyfriend say no the vagina has become big so that it should get back in size so that he can feel that grip so mostly they use it in the vagina so that it tightens the vagina upon even sniffing it because when you sniff it becomes mostly high but when you put it in the vagina it tightens the vagina so that you feel all the pressure.” (Adolescent, Female).
Community-level factors			
Availability and normalization of substances.	Focus group discussions	Ex 8	FCG: “I would like to talk about Kachasu. Kachasu is drunk a lot and there is nothing like this is a young child or an adult it is being consumed and any house you go to you will find that they are selling Kachasu and then you will find that this Kachasu is very cheap between K5 or K6 so they drink a lot of it. So they measure this size (about 330 mls) and Kachasu is strong so when you just drink two then you are drunk and it is sold at almost every household so there is nothing like I will have to go far to look for it – its being brewed in homes and people order and keep for sale in homes so Kachasu is a problem and a lot of children are drinking it.” (Male) Ex MH: “They resort to drinking alcohol because this is readily available and is cheaper. So that’s our experience that a lot of youths would normally drink lagers and often times they would go for this kind of alcohol which is highly potent, readily

Table 2 (continued)

Theme	Data source	Example	Illustrative Statement
Unemployment and lack of engagement	Focus group discussion Key informant interview (KII) Focus group discussion	Ex 7	available and also cheaper.” (Male) HW: “The contributing factor is no activities for these young male adolescents in the compounds especially those that have dropped out of school, so you will find that such keeps them busy and that leads them in partaking such things, so it is just peer pressure that surrounds them, nothing else to do, playgrounds for football has been taken up as residential plots.” AB: This was further worsened by the lack of employment opportunities in the community which made adolescents to resort to alcohol and substances as a coping mechanism. “The other thing that I have observed like mostly its lack of employment, the lack of employment has contributed to abusing of drugs because most of the time they don’t have anything else to do so mostly what they think is to go and drink some beers or to abuse drugs because they have nothing else to keep them busy. So it’s things like the lack of employment and poor background of education”. Ex MH: “The issue of unemployment is one of the main reasons. These young people are not employed. Some of them have finished college, but they are wondering where they can find jobs. And so at the end of the day, they get frustrated and they end up maybe drinking as a way of coping with these frustrations. And which includes also the issue of boredom. You are home the whole day and you cannot find something as an alternative way of recreating so you turn to drugs or alcohol. So those could be some of the reasons why these peers or young people are drinking and using substances.” (Male) HW: Many participants also reported that absolute poverty in the community also contributed to parents been unable to financially support their children which resulted in many adolescents dropping out of school and becoming a victim of alcohol and substance abuse. HW: “So mostly I would say poverty has burdened our community such that we can’t afford to send these children to school so they resort to

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Table 2 (continued)

Theme	Data source	Example	Illustrative Statement
Community Stigma	Focus group discussion	Ex 6	doing bad things like smoking dagga or beer drinking as a way of life." HW: "I am going to refer to the child that abuses Bostick whom I made reference to earlier. I spoke to the mother to bring the boy to Chainama Hospital for further management but knowing that the hospital deals with mental patients she decided to abandon the idea for fear of being stigmatized in the community that she has a mad son." (<i>Lay health worker</i>)
Policy and Structural-level Factors			
Lack of youth friendly rehabilitation services.	Key informant interview (KII)	Ex 9	Ex MH: "We have a high turnover for alcohol. So it's almost like meeting that demand and then quickly bringing in new people. There's limited infrastructure. A lot of families or parents would want us to keep the person for longer they will be like, "Its better he stays for long so that he is away from the environment" and we say "we would like to but unfortunately for now we can't due to limited infrastructure I need to create space for others to also come". So we manage acutely, then we hope the rest can be as outpatient and other follow ups but you know that's not the best decision when someone is fighting an addiction. Once the person is discharged from Chainama, due to lack of resources follow up becomes really difficult for the staff due to human resource and also financial resource. So you work with what you have." (<i>Female</i>) Ex MH: "We need to build a Rehab Centre for them we need to have proper services which are designed for children. So it is in the primary health care condition results and only is a tertiary health care services. So also, most private hospitals should accept children and adolescents with such problems, right now we see that we just close their doors to any drug or mental health problem and that should not be the case So once you know that a person has got this issue, we should be able to speak to him and once he agrees to stop, then you should take them through a proper detox. If it is a moderate to severe alcohol dependence, they need a proper detox, and then counseling, regular counseling and then obviously,
Weak health system follow-up capacity	Key informant interview (KII)		
Regulatory and enforcement gaps	Key informant interview (KII)		

Table 2 (continued)

Theme	Data source	Example	Illustrative Statement
			psychotherapy and counseling around what prompted them to take alcohol. So we should have those psychology centers throughout healthcare system at all levels of health." (<i>Male</i>) Ex MH: "There is need for government to come up with a regulatory board or framework. I know that according to the National Alcohol Policy the institution that is supposed to be regulating this is the Health a Professional Council of Zambia (HPCZ). The HPCZ has been entrusted with these responsibilities. But of course, for lack of maybe understanding, we don't know if there are any guidelines, if there are any policies around what should be done, if there are any by-laws or regulations to regulate these we are not really sure because we haven't seen HPCZ go around and find out what we are doing, who are your staff, who trained them, what kind of qualifications they have and so on. So, again that is a challenge." (<i>Male</i>)
Need for comprehensive community programming	Focus group discussions	Ex 10	HW: "The ones that are in charge for curbing drugs, I would say they are putting more effort but for me they are failing. So I would say that we need more programs, because it is not just HIV, there is a lot happening in these communities reason why we need more programs, maybe to involve more people." FCG: "Women have a lot of activities to participate in, for instance, they are taught how to make bar soap, then after that they sale, then they get commissioned from there. We also have Dreams program for female adolescents, at Dreams program they are taught how to make earrings, hats and shoes and handbags, so for men and with your research think about, "how are we going to help male adolescents" because women have a lot of ways when it comes to helping them" (<i>Caregiver</i>)
Gender norms in substance use	Focus group discussion	Ex 11	HW: "The ones that are in charge for curbing drugs, I would say they are putting more effort but for me they are failing. So I would say that we need more programs, because it is not just HIV, there is a lot happening in these communities reason why we need more programs, maybe to involve more people." FCG: "Women have a lot of activities to participate in, for instance, they are taught how to make bar soap, then after that they sale, then they get commissioned from there. We also have Dreams program for female adolescents, at Dreams program they are taught how to make earrings, hats and shoes and handbags, so for men and with your research think about, "how are we going to help male adolescents" because women have a lot of ways when it comes to helping them" (<i>Caregiver</i>)
			HW: "The contributing factor is no activities for these young male adolescents in the compounds especially those that have dropped out of school, so you will find that such keeps them busy and that leads them in partaking such things, so it is just peer pressure that surrounds them, nothing else to do, playgrounds for football has been taken up as residential plots.

AB: AYA Boy, AG: AYA Girl, FCG: Female Caregiver, HW: Health worker, Ex MH: Expert in Mental Health.

codeine, and mixtures such as "volo" (sniff tobacco) (Ex 2, Table 2). Teens also believed that smoking marijuana stimulates the brain and develops students' intelligence. AYA noted that those currently in school were at risk of starting marijuana or alcohol use, given they had access to substances through other classmates or used AODs at school (Ex 2, Table 2). Female AYA, on the other hand, commonly used substances like "Nsunko," (tobacco), which were believed to enhance sexual appeal or function (Ex 2, Table 2). These beliefs were reinforced by misconceptions circulated among peers, contributing to normalization and acceptance of AOD use.

Desire to but unable to quit. Most AYA reported that although many AYA expressed a strong desire to cease their use of AODs, they found it exceedingly difficult to do so. Despite their intentions to discontinue AOD use, AYA frequently became trapped in a persistent cycle of addiction (Ex 3, Table 2). Participants described withdrawal symptoms, which emerged upon attempts to stop using AODs, and often feeling compelled to resume AOD use to alleviate them (Ex 3, Table 2). Consequently, AOD use among AYA was maintained not solely for recreational purposes, but also as a means of managing the physical and psychological discomfort associated with withdrawal, thereby reinforcing the cycle of addiction.

3.1.2. Interpersonal level factors

Peer pressure and social conformity. There was consensus across all participant groups that peer influence was a primary driver of AOD use among AYA within the community. AYA reported that AOD use was often motivated by a desire to belong to or fit in with peer groups (Ex 4, Table 2). AOD use was associated with social acceptance, and individuals who engaged in AOD consumption were frequently perceived as "cool" by their peers (Ex 4, Table 2). Initial AOD use commonly began as a leisure activity or a means of social bonding; however, over time, it often escalated into patterns of dependency and addiction.

Bullying and coercion. Bullying also contributed to AOD initiation. Some AYA began using drugs like marijuana to avoid being targeted or harassed by peers already engaged in substance use. Fear of physical violence or ridicule compelled them to conform (Ex 5, Table 2). Other AYA started to experience bullying from friends at school, and this was given as a reason for initiating AOD use at a young age.

3.1.3. Community level factors

Unemployment and lack of engagement. Overall, there was consensus among participants that the lack of accessible recreational activities, such as sports facilities, contributed significantly to AYA's engagement in AOD use. Participants noted that the absence of structured leisure opportunities resulted in AYA experiencing excessive free time, which in turn led to experimentation with AODs, often as a means of alleviating boredom (Ex 7, Table 2), which frequently progressed into habitual use and ultimately, addiction.

Community Stigma. Stigma associated with seeking mental health care, particularly admission to the main mental health hospital, was identified as a significant barrier to accessing treatment for AYA with AOD use problems. Caregivers expressed reluctance to seek professional help due to fear of being stigmatized by the community, with concerns that their AYA would be labeled as "crazy" or mentally unstable. This fear of social judgment discouraged timely care-seeking and contributed to delays in intervention and support (Ex 6, Table 2).

Gender-norms in substance use. At the community level, gender norms intersected with structural and environmental conditions to shape exposure and vulnerability. The widespread availability and affordability of substances created a shared risk environment; however, how adolescents engaged with this environment differed by gender. For boys, unstructured time linked to unemployment and lack of recreational opportunities facilitated clustering in peer groups (Ex 12, Table 2)

where substance use was normalized and collectively practiced. For girls, engagement with these same environments was more constrained by social norms but also shaped by different vulnerabilities, including pressures related to relationships and social acceptance. Community stigma surrounding substance use and mental health further operated in gendered ways, with stronger social sanctions often applied to girls, reinforcing silence and delaying care-seeking.

Availability and normalization of substances. AODs were widely available and extremely affordable even to minors. Locally brewed alcoholic beverages and high-potency spirits were sold cheaply in sachets and widely distributed. This ease of unrestricted access to AOD use venues within their communities contributed to widespread use among AYA (Ex 8 Table 2). Bars lacked enforcement of age restrictions, and many vacant homes operated as informal drinking spots or drug dens. These spaces offered privacy and protection from judgment, allowing AYA to consume AODs without fear of being reported or arrested (Ex 8, Table 2).

3.1.4. Policy/structural level factors

Lack of youth friendly rehabilitation services. There was a noticeable absence of standardized national guidelines for treating AOD use disorders. Although a national alcohol policy exists, its lack of enforcement and oversight significantly hampers effective service delivery. Participants reported numerous cases of mental health disorders associated with AOD use, including psychosis and severe behavioral disturbances (Ex 9, Table 2). These conditions were often left untreated due to limited mental health infrastructure.

Weak health system follow-up capacity. While the main mental health hospital provides detox services, the facility faces serious limitations in space and staffing (Ex 9, Table 2). This results in short-term management with minimal follow-up care, contributing to high relapse rates. Social stigma further discourages families from seeking treatment, as admission to a mental health institution is often associated with being "mad." There is also a lack of AYA-specific rehabilitation centers. Existing private treatment options are prohibitively expensive, making them inaccessible to many families in disadvantaged communities. Mental health experts noted a pressing need for affordable, age-appropriate, and holistic treatment services integrated across all levels of the health system.

3.1.5. Divergent perspectives across stakeholders

Although there was broad agreement regarding the multilevel nature of AOD use, perspectives varied across stakeholder groups. AYA frequently framed substance use as a coping response to trauma, social exclusion, and limited opportunity, whereas caregivers were more likely to emphasize family strain and behavioral concerns. Healthcare workers and mental health professionals focused primarily on structural and service-delivery gaps, including the absence of standardized treatment pathways and youth-friendly services. Gender differences were also evident: boys often described perceived performance-enhancing effects of substances, while girls more commonly referenced social and relational pressures. These divergent framings highlight the need for interventions that are responsive to differing lived experiences and expectations across groups.

3.2. Stakeholder preferences for prevention and treatment

Participants across stakeholder groups emphasized the need for comprehensive, youth-centered approaches to prevention and treatment that extend beyond HIV programming alone. Although preferences varied, there was broad consensus that current services are fragmented, under-resourced, and insufficiently responsive to AYA lived realities. Most prevention efforts were embedded within HIV-focused projects and largely targeted AYA girls, leaving boys underserved. Youth-friendly spaces at clinics were underutilized due to lack of awareness, and religious institutions offered limited engagement through music and sports

programs (Ex 10, Table 2). Furthermore, programs outside of HIV related services were not preventive as they focused on AYA already struggling with addiction.

3.2.1. Integrated and holistic service delivery

Many participants advocated for greater integration of AOD, mental health, and HIV services. Providers noted that existing programs often operate in silos, limiting continuity of care and contributing to relapse. AYA and caregivers emphasized the importance of addressing psychological distress alongside substance use, particularly given the role of trauma and stigma in shaping AOD initiation and persistence. Stakeholders described a need for holistic models that combine counseling, peer support, and family engagement within accessible community or clinic-based settings.

3.2.2. Youth-friendly and gender-responsive programming

Participants consistently highlighted the absence of adolescent-specific rehabilitation services. Caregivers and providers described existing services as adult-oriented and stigmatizing, while adolescents emphasized discomfort in seeking care in settings associated with severe mental illness. Stakeholders also noted that many prevention efforts embedded within HIV programs disproportionately targeted girls, leaving boys underserved.

Structural constraints amplified these gendered dynamics. The lack of youth-friendly and gender-responsive rehabilitation services, combined with weak policy enforcement and limited follow-up care, restricted access to effective treatment for all adolescents, but with uneven implications. Prevention and intervention efforts were often embedded within HIV-focused programming that disproportionately targeted adolescent girls (Ex 11, Table 2), leaving boys underserved despite high levels of substance use within male peer networks. At the same time, the absence of discreet, acceptable, and adolescent-appropriate services created barriers for girls, for whom stigma and reputational concerns were more acute. As a result, both boys and girls remained inadequately supported, albeit through different pathways of exclusion. Respondents called for youth-friendly spaces that are inclusive, gender-responsive, and tailored to developmental stage.

3.2.3. Community-based prevention and engagement

Participants underscored the need for community-level prevention strategies, including recreational programming, sports, and vocational engagement to reduce idle time and address structural drivers such as unemployment. Religious and community institutions were identified as potential platforms for engagement, though current offerings were described as limited in scope. Several stakeholders emphasized that prevention initiatives should begin earlier in adolescence and extend beyond individuals already experiencing severe substance use disorders.

3.2.4. Strengthening rehabilitation and follow-up systems

Mental health professionals and lay healthcare workers emphasized the need for standardized national treatment guidelines and improved follow-up care. Limited detox capacity, insufficient staffing, and high costs of private rehabilitation were described as major barriers. Participants called for expanded public-sector rehabilitation services that are affordable, age-appropriate, and integrated across levels of the health system.

4. Discussion

This study explored the multifaceted drivers of AOD use among AYA in Zambia, revealing a complex interplay of individual, interpersonal, community and policy/structural level factors that both initiate and sustain AOD use among young people. Findings provide valuable insight into the contextual and systemic gaps that must be addressed to reduce the burden of AYA AOD use and associated harms.

At the individual level, AYA were found to initiate AOD use primarily

as a coping mechanism in response to varied traumatic life events such as bereavement, abuse, neglect, or the discovery of an HIV-positive status. These findings align with contemporary trauma theory, which suggests that children/AYA exposed to traumatic life events are at an increased risk of developing substance use disorder (Goodman, 2017). In the absence of structured emotional support systems, AYA turned to substances to manage grief and psychological distress, reinforcing the need for trauma-informed mental health services targeting youth. Integrating trauma-informed therapy within schools to help AYA dealing with traumatic life events can potentially reduce AOD use among AYA (Wichmann et al., 2022) but this has not been done in Zambia and rarely in LMIC.

Peer pressure and misinformation about perceived benefits of drug use, especially among out-of-school youth, contribute to the normalization of risky behaviors, while community-level challenges such as unemployment, lack of recreation, and easy access to substances further exacerbate the issue. Peer influence emerged as a dominant interpersonal factor, particularly among out-of-school youth. The pressure to conform and the desire for social acceptance often outweighed personal reservations. These findings align with the literature on AOD use in Zambia (Shibalika, 2021; Tembo et al., 2022; Zemba, 2022). The normalization of drug-related narratives, gendered AOD use behaviors, and peer-driven initiation into AOD use highlight the need for school- and community-based programs that address misinformation, challenge harmful norms, and build resilience. Peer-led initiatives, storytelling, and youth mentorship models may help shift social norms while fostering safer environments (Griffin and Botvin, 2010). Additionally, the presence of bullying as a coercive factor for AOD initiation suggests the need to strengthen school-based safeguarding mechanisms and promote positive peer environments. These findings suggest the need for more AOD use programs integrating a peer-to-peer approach in preventing initiation of drugs. Furthermore, it is important to dispel misconceptions surrounding common drugs such as cannabis or *volo* as accurate information on the associated health and developmental risks is important for AYA to make informed decisions.

At the community level, poverty, unemployment, and the lack of structured recreational activities were identified as key contributors to AOD use. AYA, particularly those not in school, reported using substances to combat boredom and social disengagement. Addressing broader social determinants such as providing employment opportunities and re-engaging school dropouts could serve as protective measures against substance use (Settipani et al., 2018). Given the influential role of peer dynamics, community venues, and recreational scarcity in driving AOD use, intervention strategies must include community mobilization. This includes engaging religious leaders, caregivers, teachers, and youth organizations in creating supportive environments that promote alternatives to AOD use. Developing low-cost, accessible recreational programs could provide healthy outlets for AYA, especially those out of school or unemployed. Broader social protection measures such as cash transfers for vulnerable households, youth employment programs, and reintegration pathways for school dropouts could mitigate many of the root causes pushing AYA into AOD use. Lastly, we need to develop gender specific programs tailored to the unique needs of both male and female AYA.

At the policy/structural level, the limited capacity compounded by pervasive stigma and inadequate AYA-specific services, restricts treatment access, particularly for mental health and substance-related complications. These findings highlight the urgent need for a coordinated, multisectoral response that includes strengthening prevention, expanding treatment infrastructure, addressing structural determinants, and promoting youth- and family-centered interventions tailored to the Zambian context.

Stigma emerged as a significant barrier to support. AYA who use substances were often viewed as irredeemable or dangerous, discouraging them from accessing both community support and formal treatment. Family members expressed emotional fatigue and helplessness in

trying to support AYA, indicating the need for family-centered interventions. Family-focused interventions including parenting programs, counseling services, and support groups could strengthen caregiver capacity to respond supportively and effectively (Nguyen et al., 2021). There is also a need to address the stigma that limits open dialogue within families and prevents help-seeking.

Easy access to AODs facilitated by poorly regulated informal markets and a lack of enforcement in bars further enabled use. This reflects critical gaps in regulatory oversight and highlights the need for policy and systems strengthening. Zambia's existing national alcohol policy has yet to translate into actionable treatment guidelines or consistent enforcement. Integrating AOD use services into national health strategies and ensuring the implementation of minimum-age sales regulations are essential policy priorities. Strengthening regulatory frameworks such as minimum age enforcement for alcohol purchase, monitoring of informal alcohol distribution, and integration of mental health and substance use services into national health strategies is essential. Additionally, developing national AYA-specific protocols and referral systems could help standardize care and reduce the current reliance on under-resourced institutions like the sole mental health hospital. There is an urgent need for the government and stakeholders to invest in AYA-specific rehabilitation centers that provide age-appropriate detoxification, counseling, and reintegration support. Public-private partnerships and subsidized care models may help address current financial barriers. Mobile outreach and tele-counseling could also improve access to care for hard-to-reach or stigmatized populations.

The consequences of AOD use were both physical and mental. Participants linked AOD use to increased risky sexual behavior, unplanned pregnancies, and heightened vulnerability to HIV and STIs. Mental health complications, including psychosis, were prevalent but largely untreated due to limited-service availability and pervasive stigma. The lack of AYA-specific services, particularly in detoxification and rehabilitation further, compounds these issues. The country's primary treatment center is overwhelmed and under-resourced, highlighting the need for a decentralized and AYA-focused treatment infrastructure. Expanding treatment access through the establishment of AYA-specific rehabilitation centers, scaling mobile outreach services, and exploring telehealth models could improve access, especially in underserved areas. Financial barriers also need to be addressed through subsidized or publicly funded treatment options, as private services remain inaccessible to many.

4.1. Implications for policy and practice

AOD use among AYA in Zambia operates as a self-reinforcing cycle driven by distress-related initiation, socially transmitted beliefs, permissive community access, and weak treatment pathways. Disrupting this cycle requires a layered response across multiple entry points, including early identification within routine services, credible peer- and school/community-based prevention, strengthened caregiver capacity, and accessible community-based treatment with follow-up. This approach aligns with global guidance promoting integrated, adolescent-responsive care delivered in non-specialist settings with linkages to HIV services and social protection, and is supported by Zambia's National Alcohol Policy (Zambia Ministry of Health, 2018) and Adolescent Health Strategic Plan (Moomba et al., 2025). However, stronger implementation is needed, particularly in enforcing age restrictions, regulating informal alcohol markets, and developing adolescent-specific treatment guidance.

In the Zambian context, resource constraints necessitate prioritizing brief, scalable interventions embedded within high-contact platforms such as ART clinics, youth-friendly corners, SRH services, and school health programs. WHO guidance supports screening and brief interventions for hazardous alcohol use in primary care, which can be adapted locally and strengthened with trauma-informed engagement, safety planning, and linkage to psychosocial support through non-

specialist delivery models (WHO, 2026). The mhGAP framework further reinforces the feasibility of task-shared care for substance use and comorbidities (WHO, 2016). In parallel, UNAIDS/WHO guidance emphasizes integrating mental health and substance use into HIV responses and linking to social protection, directly reflecting findings that HIV diagnosis can trigger distress-driven AOD use and that current HIV-embedded interventions remain unevenly targeted (Ferenchick et al., 2025). Overall, a task-shared, stepped-care model embedded within existing youth and HIV platforms offers a feasible, policy-aligned pathway, with scalable packages prioritized in the short term and sustained investment in adolescent-responsive treatment systems required over time. This type of intervention is currently being tested for adults living with HIV in Zambia (Vinikoor et al., 2023), but has not been tested among youth. At the national level, Zambia's Adolescent Health Strategic Plan provides a clear policy "home" for these actions and an entry point for multisectoral coordination across health, education, community development, and youth programming. Implementation must address key system constraints such as workforce shortages, stigma, cost, and fragmented services through task-shifting to lay providers, embedding services within non-stigmatized platforms, and strengthening referral and follow-up systems.

4.2. Limitations

While this study offers rich qualitative insights, it is limited to urban settings and may not fully represent experiences in rural or peri-urban areas. Similarly, the clinic-based recruitment for AYA may limit generalizability. Although we did not ask AYA directly about their own experiences with substance use, it remains possible that social desirability impacted responses during the focus group discussions. We also did not ask AYA directly about their HIV status. Our definition of HIV-affected was purposefully broad to increase generalizability, however, we were unable to explore the degree to which differences within the HIV-affected definition (e.g., AYA living with HIV compared to AYA living with a caregiver who has HIV) are associated with perceptions on substance use. Interviews with AYA were largely conducted in Bemba and Nyanja and translated into English for analysis by trained bilingual staff. Although care was taken to preserve meaning through iterative review and team discussion, translation is inherently interpretive, and subtle linguistic or cultural nuances may have been altered. Data generation and interpretation were shaped by the research team's positionality. Team members brought backgrounds in public health and substance use research, and interviewer identities and institutional affiliations may have influenced how AYA participants narrated experiences. We acknowledge that interpretation is co-constructed and influenced by researchers' perspectives.

4.3. Conclusion

Overall, the findings suggest a coordinated, multisectoral response that integrates health, education, social protection, and justice systems would be beneficial for AYA. According to our participants, substance use among AYA in Zambia is being driven by a convergence of trauma, peer dynamics, structural inequities, misinformation, and weak policy implementation. Addressing this issue requires a holistic, youth-centered approach that acknowledges the layered realities shaping AYA behavior. Investments in integrated mental health and substance use services, alongside community-based prevention and policy reform, are possible mechanisms for safeguarding the well-being of Zambia's youth. This study identified several key areas for future research, including epidemiologic studies with population-based samples to estimate prevalence and trajectories of AYA AOD use, evaluations of intervention models, such as screening, brief intervention, and referral to treatment (SBIRT), and gender-specific analyses to understand differential risks and outcomes. Such research will be vital to designing contextually adapted, evidence-based responses to AYA substance use in

Zambia.

CRedit authorship contribution statement

Jeremy C. Kane: Writing – original draft, Supervision, Methodology, Funding acquisition, Conceptualization. **Tukiya Kanguya:** Writing – original draft, Methodology, Formal analysis, Data curation. **Alejandro Paniagua-Avila:** Writing – review & editing, Methodology, Formal analysis. **Marksman Foloko:** Writing – review & editing, Writing – original draft, Formal analysis. **Chanda Mwamba:** Writing – review & editing, Formal analysis. **Judith A. Hahn:** Writing – review & editing, Conceptualization. **Carl Latkin:** Writing – review & editing, Conceptualization. **Silvia S. Martins:** Writing – review & editing. **Geetanjali Chander:** Writing – review & editing. **Rhea Pawar:** Writing – review & editing. **M. Claire Greene:** Writing – review & editing. **Kabwe Mwamba:** Writing – review & editing. **Anjali Sharma:** Writing – review & editing, Writing – original draft, Methodology, Conceptualization.

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Declaration of competing interest

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Appendix A. Supplementary data

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