9 Are adolescent boys and young men being left behind? missing discourse and missed opportunities for engagement in HIV prevention in Eastern and Southern Africa

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Introduction

Worldwide, HIV incidence among young females aged 15–24 is 44% higher than it is among their male counterparts (UNAIDS (Joint United Nations Programme on HIV/AIDS), 2017). This gender divide is especially pronounced in Eastern and Southern Africa (ESA), where young women accounted for 26% of new HIV infections in 2016 despite comprising about 10% of the population (UNAIDS, 2017). Adolescent girls and young women (AGYW) have therefore been the focal point for HIV prevention initiatives, whereas adolescent boys and young men (ABYM) have been relatively overlooked. Although HIV prevalence peaks among men in sub-Saharan Africa (SSA) at a much later age than it does among women, ABYM are not at zero risk. Moreover, behavioural patterns formed during early adolescence become ingrained in adulthood (Woog and Kagesten, 2017), setting the stage for adolescent boys' increasing risk of HIV acquisition as they age. Early adolescence provides an opportunity for instilling positive sexual and reproductive health attitudes and behaviours.

Pronounced gender disparities occur across the HIV care continuum (DiCarlo et al., 2014; Gari et al., 2014; Staveteig et al., 2017). ABYM, especially those who have sex with other boys or men (Cornell and Dovel, 2018), continue to be left behind in efforts to achieve the 90–90–90 goals (UNAIDS, 2017a). Studies in many ESA countries have shown that HIV testing rates are sub-optimal among 15–24-year-old ABYM (9% ever tested vs 13% of girls the same age) (United Nations Children's Fund (UNICEF), 2018), as are initiation of and adherence to antiretroviral therapy (Ochieng-Ooko et al., 2010), retention in HIV care (Koole et al., 2014; Dovel et al., 2015, 2016), and viral suppression.

For these reasons, ABYM have been described as the “forgotten fifty per cent” (Varga, 2001). Funding support for HIV prevention for ABYM has

been limited compared to that for AGYW, resulting in insufficient data on the intersecting multi-level factors that contribute to HIV risk among them, and to the dearth of risk-reduction programmes. Despite this, we are unaware of any synthesis of HIV prevention research regarding ABYM in SSA. In response to this gap, we conducted a focused review in ESA countries to identify the HIV prevention research findings among ABYM aged 10–24 and to address three issues:

- 1 What factors create contexts of risk for HIV acquisition and promote or limit adoption of HIV prevention behaviours among ABYM in ESA?
- 2 What types of evidence-based HIV prevention interventions have been conducted with ABYM in ESA and what are their results?
- 3 What are key gaps in research on HIV prevention among ABYM in ESA?

We used a social-ecological framework (Bronfenbrenner and Ceci, 1994) to map and synthesize the multi-level factors that drive risk of HIV acquisition and to describe types of interventions for ABYM. Five researchers conducted a focused literature search to identify relevant studies, including studies on sexual risk behaviours and substance use as well as interventions – structural (e.g. cash transfers), biomedical (e.g. HIV testing and counselling, voluntary medical male circumcision [VMMC] and pre-exposure prophylaxis [PrEP]) and behavioural (e.g. condom promotion, school-based risk-reduction and interpersonal violence). Searches were limited to English articles and to the 24 countries in eastern (Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Mauritius, Rwanda, Seychelles, Somalia, South Sudan, Tanzania and Uganda) and southern Africa (Angola, Botswana, Eswatini [Swaziland], Lesotho, Madagascar, Malawi, Mozambique, Namibia, South Africa, Zambia and Zimbabwe) between 2005 and March 2018 (to capture data after ART roll-out). Quantitative and qualitative studies that included data on ABYM aged 10–24 were included. We excluded studies that did not have male-specific data within our specified age range as well as studies on preventing onward HIV transmission among people living with HIV.

Factors associated with HIV acquisition among ABYM

Transitioning from adolescence to young adulthood is a period of key biological and developmental life-course changes including completion of school, marriage, and childbearing, all of which may influence the risk of HIV acquisition (Lloyd, 2005). These life transitions differ for men and women and are largely shaped by culturally based social norms, especially those related to gender. In the context of this developmental period, young men's risk of HIV acquisition is driven by a constellation of intersecting social-structural, interpersonal and individual-level risk factors, as described in the following.

Social-structural risk factors. Education, marital status, employment and income have been studied as potential risk factors for HIV acquisition among adolescents in SSA. For example, whether higher educational attainment has any relationship to the risk of HIV in ESA has been investigated since early in the epidemic. A systematic review conducted in 2002 (Hargreaves and Glynn, 2002) concluded that higher educational attainment was more often associated with greater risk of HIV than was lower educational attainment. Two subsequent systematic reviews – one of studies published between 2001 and 2006 (not restricted to youth) (Hargreaves et al., 2008) and the other of studies published between 2007 and 2017 (restricted to youth) (Pace, 2018) – indicated that the pattern of association appears to be changing over time, despite considerable heterogeneity (Hargreaves et al., 2015). Higher educational attainment was protective against HIV infection more often in studies conducted after 1996 (Hargreaves et al., 2008). This trend continued in studies included in the 2007–2017 review (Pace, 2018); more studies showed a protective effect of education, with higher educational attainment associated with decreased HIV risk.

Evidence is limited concerning whether educational attainment has a differential impact on boys than girls. In the most recent review, covering 17 studies conducted in ESA, only two reported differences by gender (Pace, 2018). One study of HIV incidence in rural South Africa reported a statistically significant protective association between secondary education and HIV infection for women but not for men (Hargreaves et al., 2008). In a study of HIV incidence in Uganda, being enrolled in school was protective for both women and men but completing secondary school (relative to completing only primary school) was protective only for men (Santelli et al., 2013).

Marriage has been associated with protection against HIV acquisition in some studies and systematic reviews, and divorce or separation has been associated with increased risk. For example, data from 6741 sexually experienced youth aged 15–24 in the Ugandan Rakai Community Cohort Study between 1999 and 2008 found that formerly married ABYM and AGYW had higher risk of new HIV infections than married and never married youth (Santelli et al., 2013), perhaps because formerly married youth had more sexual partnerships than the other groups.

The search for work is one of the main drivers of youth mobility across ESA (Boerma et al., 2002; Camlin et al., 2014; Schuyler et al., 2017; Olawore et al., 2018), and people involved in certain occupations appear to be at higher risk for HIV infection (Serwadda et al., 1992; Kagaayi et al., 2014). Occupations such as motorcycle taxi drivers, truck drivers, traders, police and security officers and those in hospitality service industries (bar, restaurant and hotel workers) place people at greater risk for HIV infection. In contrast, low-risk occupations include jobs in engineering and mechanics, subsistence farming and government (such as health workers or educators). For youth, these high-risk occupations are frequently the only wage-earning jobs available, and these structural forces place youth at increased risk

for HIV infection (Kreniske et al., 2019). There are a number of reasons why mobility is associated with higher risk of HIV among migrants and the partners they leave behind, including demographic factors, separation from partners, family and friends, multiple concurrent sexual partners, frequent partner change and disparities in access to prevention services (Weine and Kashuba, 2012; Magadi, 2013; Olawore et al., 2018). Additionally, structural factors may place migrants in situations where uneven power dynamics force them to make decisions that increase risk for HIV infection (Kreniske et al., 2019). There are significant gender disparities in HIV risk among 15–24-year-old migrants in SSA. AGYW are 2.5 times more likely to be HIV-positive than ABYM, even when demographic and sexual behaviour factors are taken into account (Magadi, 2013).

Peer and family norms. During early adolescence, young people become cognizant of peer norms. A wealth of research has focused on how social constructions of gender that privilege men and dominant ideas about masculinity are detrimental to AGYW by condoning male control over sex and condom use, and violence against women (Barker and Ricardo, 2005). However, social constructions of manhood also increase men's risk for HIV by valorising multiple sexual partnerships, transactional sex and condomless sex. These norms also constrain ABYM usage of health services and adoption of HIV prevention behaviours such as HIV testing, safer sex communications with partners, and avoidance of alcohol and drug use (UNAIDS, 2017a).

The importance of these norms was demonstrated in a study of 14–17-year-old youth in South Africa. Boys' perceptions of whether their male and female peers were sexually active, a stronger belief that it is "ok for a girl to propose love to a boy" and stronger support for the idea that it is "ok for a girl to refuse sex when her boyfriend refuses to use a condom" were statistically significant predictors of ever having had sexual intercourse (Harrison et al., 2012). Older boys, boys who strongly endorsed the idea that "using condoms is a way to show love and respect for your partner," and boys who perceived that male peers were using condoms had significantly higher odds of condom use at last sex. These findings indicate that peer norms can have a positive impact on adolescent boys' use of condoms, and they point to a strategy of targeting peer norms in risk-reduction interventions for adolescent boys.

A study in South Africa's Eastern Cape also showed a relationship between holding more gender-equitable norms and condom use among ABYM aged 15–26 (Shai et al., 2012). Consistent condom users held less conservative gender attitudes, were less violent, and engaged in less risky sexual behaviour than inconsistent condom users, highlighting the need for focusing on healthy masculinities in HIV prevention interventions.

A recent systematic review also pointed to the salient role of family in influencing young adolescents' construction of gender norms (Kågesten et al., 2016). For example, adolescent boys in Botswana recruited from

secondary schools and after-school and sports programmes were more likely than adolescent girls to report positive relationships with parents. Additionally, boys perceived greater community normative beliefs that condoned sexual risk behaviour. However, both boys and girls reported low levels of parental monitoring, parental reinforcement, and parental communication and comfort in addressing questions about sexuality and sexual development (Sun et al., 2018).

Health services. Access to sexual and reproductive health services has often been challenging to adolescents because services are not attuned to the developmental needs of youth. These challenges include inconvenient clinic hours for in-school youth, limited transportation to clinics (Wood and Jewkes, 2006; Lightfoot et al., 2017), pervasive stigma around sexual and reproductive health reflected in verbal harassment, name-calling, social isolation and punishment by providers, peers, family and community members, and in some cases, need for parental consent (Nyblade et al., 2017). This issue is intensified for ABYM because public-sector health facilities in many ESA countries are not typically oriented to male needs. Due to limited research, we know little about the experience of ABYM seeking healthcare services (Fortenberry, 2017). Some studies suggest that youth-friendly services that do not interfere with school attendance or work can increase access to HIV testing for both adolescent boys and girls (Francis, 2010). For sexual and gender minority youth, barriers to accessing sexual and reproductive health services may be even more acute than for heterosexual and cisgender youth due to social stigma, assumptions of heterosexuality, healthcare providers' moral values and criminalisation of consensual sexual activities with same-sex partners (Müller et al., 2018).

Interpersonal-level/social risk factors

Partnership and sexual networks

Characteristics of partnerships and social networks may contribute to the risk of HIV acquisition, but studies of age-disparate partnerships and HIV risk have been examined among young women and have produced mixed findings (Harling et al., 2014; Schaefer et al., 2017). Less is known about the sexual partnerships of ABYM, although we know that concurrent sexual partnerships are common. Multiple sexual partnerships were more common among 15–19-year-old ABYM in SSA than their female counterparts based on 2000–2010 DHS and AIDS Indicator Survey data (Doyle et al., 2012). Data also indicate that some ABYM have sex with older women (“sugar mommies”) for economic gain (Onoya et al., 2015). Little is known about which of these behaviours and in what contexts are most risky. However, one study from Uganda found that the number of sexual partners in the last 12 months was not associated with incident HIV infection in young men, although it was among young women (Santelli et al., 2013).

Communication with sexual partners

There is a dearth of studies on communication between ABYM and their sexual partners in ESA. However, one cross-sectional survey of potential HIV risk factors in 983 boys and girls aged 14–17 in rural South Africa found that discussion of condom use with a partner was the strongest predictor of condom use at last sex, with a sevenfold increase for boys compared to a fivefold increase for girls (Harrison et al., 2012).

Parental influence on ABYM prevention practices

Parents/guardians can be an influence in shaping cultural and gender norms in adolescents, and this may in turn affect their risk of HIV. However, parents may play a limited role in supporting their sons to adopt HIV preventive behaviours. This conclusion emerged from a study of parental role in supporting voluntary medical male circumcision (VMMC). In interviews in 2015–2016 with 1293 ABYM aged 10–19 who intended to or who were recently circumcised and focus groups with 192 of their parents/guardians in South Africa, Tanzania and Zimbabwe, parents/guardians noted challenges in talking to their sons about VMMC, especially if they did not accompany their sons to the clinic (Dam et al., 2018). Parents in all countries reported they had discussed the benefits and risks of VMMC with their sons prior to the procedure, and that their son's age influenced the level of information they shared. Most parents/guardians believed that the decision to undergo VMMC was their son's or a joint parent-son decision. Parents/guardians of youth aged 10–14 were more likely than those of 15–19-year-olds to accompany their son to pre-VMMC procedure counselling (56.5% vs 12.5%; $p < .001$), and older adolescents were more resistant to a parent being present during the procedure and post-procedure wound care.

Parents reported that they rarely talked about sex, HIV, and condoms with older ABYM and not at all with those aged 10–12, and that they did not want HIV risk and sexual health information to be discussed in their son's VMMC counselling sessions. Although this study demonstrates the important role that parents/guardians can play in supporting uptake of HIV prevention strategies such as VMMC by younger ABYM, it also reveals the discomfort that parents/guardians have about candid sexual discussions with their children.

Intimate partner violence

The epidemics of intimate partner violence (IPV) and HIV overlap in ESA. Nearly 40% of women in eastern Africa and 30% in southern Africa have experienced IPV (Devries et al., 2013; UNAIDS, 2016b), and there is a large body of research linking women's IPV victimization with increased risk of

HIV infection (Maman et al., 2002; Fonck et al., 2005; Dude, 2011; Kayibanda et al., 2012; Kouyoumdjian et al., 2013). Some studies have shown that young men who perpetrate IPV are more likely to engage in HIV risk behaviours (Dunkle et al., 2006; Jewkes et al., 2011; Mullinax et al., 2017) including abusing alcohol, having multiple sexual partners, and engaging in condomless sex (Dunkle and Decker, 2013). These risk behaviours have been linked to commonly accepted ideas about masculinity, as discussed above, and they are reinforced by social-structural inequalities (Jewkes et al., 2011). For example, focus group and in-depth interview data from the Stepping Stones and Creating Futures Interventions in South Africa found that young men in two urban informal settlements manifested their masculinity through IPV, control of female sexual partners, and having multiple sexual partners in response to their high levels of unemployment and poverty and their concomitant inability to achieve economic security (Gibbs et al., 2014).

Despite strong evidence associating men's IPV perpetration and their engagement in HIV risk behaviours, only one study to our knowledge has shown a significant relationship between IPV perpetration and HIV prevalence in young men (Jewkes et al., 2011). In that study, 18–24-year-old ABYM who stated they were physically violent towards an intimate partner were more likely to be HIV-positive than those who did not report such violence, but no association was found between reporting rape perpetration and HIV prevalence.

Few studies in ESA have examined IPV perpetration against men, that is, whether men report being a victim of IPV and/or women report they perpetrated violence against male partners. A review of IPV research in high-income countries found that men and women were equally likely to perpetrate IPV (Capaldi et al., 2012), and two ESA studies that examined this question found similar proportions of women and men reported having perpetuated IPV and having been victimized (Gass et al., 2011; Mulawa et al., 2018). Both experiences (IPV victimization and perpetration) could contribute to the increased risk of acquiring HIV among ABYM.

Individual-level risk factors

Substance use

Alcohol and drug use may affect risk of HIV acquisition due to the disinhibitory effects of these substances on decision-making about sexual behaviours such as condom use (Kalichman et al., 2007). A number of studies in ESA have shown greater alcohol use among school-age males than females. A review of national prevalence and sentinel surveillance studies in South Africa found significant gender differences in alcohol use, with adolescent males more likely to have ever consumed alcohol, engaged in binge drinking, and driven or walked under the influence of alcohol than their female

counterparts (Ramsoomar and Morojele, 2012). For example, in one such study, the percentage of adolescent boys aged 14–17 who reported alcohol use more than once a month was twice as high as it was among their female counterparts (30.3% vs 14.2%; $p < 0.01$) (Miller et al., 2017). Another study, in peri-urban areas of South Africa, found that adolescent males aged 16–18 who had been exposed to violence and those who were sexually active were four times as likely to have used alcohol in the past six months than those not having these experiences. In comparison, adolescent females who had been exposed to violence and who were sexually active each were 2.5 times more likely to have used alcohol in this period. Regarding drug use, being older (17 or 18 vs 16 years) and sexually active were associated with drug use among male adolescents (Magidson et al., 2017), whereas depressive symptomatology was a correlate of drug use among female adolescents. These findings suggest that targeted interventions to reduce alcohol and drug use may be important for reducing HIV risk among ABYM. One such intervention showing promise for reducing drug and alcohol use was conducted among unemployed men aged 18–25 in two Cape Town neighbourhoods that were randomized to an immediate intervention condition with access to a soccer program, random rapid diagnostic tests for alcohol and drug use, and an opportunity to enter a vocational training program, or a delayed control condition. Between the pre and post assessments, the frequency of substance use decreased, and employment and income increased in the immediate condition compared to the delayed condition (Rotheram-Borus et al., 2016).

Mental health

Few studies have examined associations between mental health and sexual risk behaviour among HIV-negative youth in ESA, but several have shown that mental health status is associated with sexual risk behaviour among ABYM, and that indicators of social, political and economic marginalisation of young people may be a contributory factor to their depressive symptomatology (Gibbs et al., 2016). For example, in Tanzania, among 1113 sexually active young men, 43.4% of whom were aged 15–24, higher anxiety and depression scores were significantly associated with both decreased condom use and increased partnership concurrency (Hill et al., 2017). Additionally, baseline data from a cluster randomized controlled trial of the Stepping Stones HIV prevention intervention in South Africa with 1002 female and 976 male volunteers aged 15 to 26 found that ABYM with depressive symptoms were significantly more likely to report ever having had transactional sex and ever having perpetrated IPV and rape, and were less likely to report correct condom use at last sex; at 12 months follow-up, baseline depressive symptomatology was significantly associated with failure to use a condom at last sex among ABYM. A cross-sectional survey among 1495 Zimbabwean youth aged 15–23 from 12 rural communities found that

being at risk for affective disorders was associated with having multiple sexual partners, younger age of sexual debut, and alcohol and drug use among both ABYM and AGYW (Langhaug et al., 2010).

Key social-cognitive factors

Accurate knowledge of HIV prevention among young people aged 15–24 was similar between ABYM and AGYW, based on household survey data from 23 priority focus countries (the majority in SSA) between 2011 and 2016 (UNAIDS, 2017b). A recent review of 63 HIV prevention studies that addressed the effects of sexual self-efficacy (one's perceived control of or confidence in the ability to perform a given sexual behaviour) on condom use and sexual refusal among male and female adolescents aged 10–25 in SSA indicated that ABYM generally had higher condom use self-efficacy than AGYW, and promotion of condom self-efficacy was reported to increase condom use among ABYM only (Closson et al., 2018).

Risk perception is an important cognition, as individuals who perceive themselves to be at risk may engage in avoidant behaviours to reduce acquisition of HIV (Brewer et al., 2004). Most studies have focused on individual-level factors that influence young people's perceived risk of HIV, but school/community-level factors can also be determinants of risk perception (Anderson et al., 2007; Maticka-Tyndale and Tenkorang, 2010). A cross-sectional study of sexually experienced primary school youth in Kenya included measures at the individual and community levels; it found that among adolescent boys, individual-level correlates of higher risk perception included higher knowledge about HIV/AIDS, rejection of myths surrounding HIV transmission and higher condom self-efficacy (Tenkorang and Maticka-Tyndale, 2014a). At the community level, boys living in communities with higher AIDS-related mortality had higher risk perceptions, indicating that community-level factors are also important.

Sexual practices

Sexual debut. Delaying sexual debut is a key prevention strategy among youth. Early sexual debut, often defined having had first sexual intercourse at age 14 or younger (Doyle et al., 2012; Richter et al., 2015; Durowade et al., 2017) (though there are variations by country and researcher), is more prevalent in girls than boys in many SSA countries (Idele et al., 2014) and has been associated with increased risk of HIV/STI acquisition (Singh et al., 2000). For example, a cross-sectional household survey in rural South Africa found that among ABYM aged 15–24 who reported sexual debut before age 15 (13.1%), 19% did not use condoms compared to 9% among those initiating sex after age 15, and in multivariable analysis, early sexual debut was a strong and statistically significant predictor of having three or more partners in the past three years (Harrison et al., 2010).

A study in Kenya among students aged 11–17 found that a greater proportion of boys reported having engaged in sex by age 12 (36%) compared to girls (16%) (Tenkorang and Maticka-Tyndale, 2014b). In multivariable analysis, after controlling for individual and school/community-level factors, perceiving a small or moderate risk of HIV, experiencing high levels of sexual pressure, knowing someone who died of AIDS, or endorsing a greater number of myths about HIV transmission were associated with early sexual debut among both male and female youth. Among males, sexual debut was delayed in communities where abstinence was the predominant message communicated to youth but sexual debut was positively associated with the number of male relatives talked to about AIDS. In terms of school- and community-level factors, for both male and female youth, living in communities where AIDS deaths were publicly acknowledged and attendance at schools where a Primary School Action for Better Health Programme had been present were associated with delayed sexual debut. Among males, living in communities in which promotion of abstinence was the predominant HIV prevention message communicated to youth was associated with delayed sexual debut, whereas living in communities where festivals incorporated HIV programming was associated with earlier sexual debut relative to youth in other communities.

Anal sex. Anal intercourse is often underreported or not acknowledged as a risk factor for HIV among young people in ESA. A growing body of research (Kalichman et al., 2009, 2011; Ybarra et al., 2018), including a systematic review (Baggaley et al., 2010; Owen et al., 2017), indicates that this practice is prevalent among adolescents and young people (Kalichman et al., 2009, 2011; Maswanya et al., 2012; Ybarra et al., 2018). Youth may engage in anal intercourse as a form of birth control (Royce et al., 2013; Duby and Colvin, 2014), as a means to preserve virginity and to provide male pleasure, and as an HIV risk-reduction strategy (on the basis of belief that there is a lower risk of HIV infection from anal than vaginal intercourse) (Harrison et al., 2006). A representative campus-wide survey in a South African tertiary institution found that 10.7% of young men and 3.4% of young women reported ever having engaged in anal sex (Hoffman et al., 2017). In a 2012 cross-sectional survey of 937 secondary school students aged 16–24 in South Africa, nearly three times the number of ABYM than AGYW reported ever having had anal sex (31% vs 11%), with only 5 of 349 ABYM reporting anal sex exclusively (Ybarra et al., 2018). The percentage of males who reported ever having anal sex increased with age: 55% among those aged 20–24 compared with 16% of those aged 16–17. The proportion of females who reported anal sex also increased with age, but to a lesser extent (10% among those aged 16–17 and 16% among those aged 20–24). This study did not distinguish between opposite-sex and same-sex partners, nor whether (for men) the anal sex was insertive or receptive. A population-based South African youth survey reported that young, presumably heterosexual men aged 15–24 who engaged in anal intercourse were twice as likely

to be infected compared to those reporting vaginal intercourse only (Lane et al., 2006), with those aged 15–19 being about four times as likely to be infected if they engaged in anal intercourse, even accounting for associated risk behaviours. Of the studies of men who have sex with men, few include adolescent boys. Those that do are primarily bio-behavioural surveys to estimate HIV prevalence, viral load and HIV-related risk behaviours, and these studies generally do not provide age-disaggregated data on correlates of HIV infection (Hladik et al., 2017).

Transactional sex. Transactional sex – non-marital, non-commercial sex in exchange for material goods including money, gifts, as well as favours, in non-commercial relationships (Choudhry et al., 2015; Stoebe et al., 2016) – has been associated with HIV risk. Some studies have shown high rates of transactional sex among AGYW, whereas others have shown transactional sex to be more common among ABYM. A recent review reported that several studies found a positive association between transactional sex and HIV infection among men, whereas other studies have found a weak and statistically non-significant inverse association (Wamoyi et al., 2016). Childhood exposure to abuse has been found to be a predictor of transactional sex among young rural men aged 15–26 in South Africa (Dunkle et al., 2007). In a community-based study of 15–24-year-old AIDS-orphaned and AIDS-affected adolescents and young adults in South Africa, living in an AIDS-affected family, being abused, and experiencing food insecurity were associated with heightened risk of transactional sex among both ABYM and AGYW.

Analysis of sexually active young people (1516 ABYM and 2824 AGYW) aged 15–24 from a nationally representative population-based survey in Uganda found that transactional sex increased the risk of HIV infection (Choudhry et al., 2015). Among ABYM, 5.2% reported paying for sex, and their HIV prevalence was eight times higher than that of ABYM who did not report paying for sex, even after adjusting for socio-demographic characteristics and other risky sexual behaviours. Lower educational level, ever having been forced to have sex against their will, and having multiple concurrent sexual relationships were significantly associated with having paid for sex in the 12 months prior to the survey; paying for sex was also associated with increased odds of testing HIV-positive, even after adjusting for socio-demographics and other risky sexual behaviours. Similarly, another study in Uganda found that providing or seeking gifts, money, or compensation in exchange for sex was common among both male and female university students (23% of males; 38% of females) (Choudhry et al., 2014). Survey data from a 2012 nationally representative sample of 1574 adolescents aged 10–19 in Nigeria reported that significantly fewer male (11.6%) than female (29.1%) adolescents had engaged in transactional sex ($p < 0.001$) and had sex with partners who were ten or more years older (4.6% of males; 18.2% of females among those who knew age of their sexual partners) ($p < 0.001$) (Folayan et al., 2014).

Group sex. Group sex and partner swapping associated with experimentation and pleasing partners and peers have been reported as an emerging sexual risk behaviour, increasing the likelihood of condomless sex, by both adolescent boys and girls in South Africa (Dietrich et al., 2011). The prevalence of this practice is unknown in ESA.

HIV testing

HIV testing is an important component of various prevention strategies and a key component of the WHO 90–90–90 targets, with the first goal being that 90% of those infected with HIV know that they are infected by 2020.

Prevalence of undiagnosed HIV is higher among adolescents than adults (UNAIDS, 2017; WHO et al., 2013). Between 2005 and 2010, fewer than 1 in 5 women and men aged 15–24 were estimated to be aware of their HIV status. Additionally, between 2005 and 2012, AIDS-related deaths among adolescents increased by about 50% (from 71,000 in 2005 to 110,000 in 2012) compared to a 32% decrease in all other age groups during the same period. One study has suggested that this high mortality rate may be due to the low HIV testing rates, which contribute to late initiation of care (Idele et al., 2014).

In ESA, there have been long-standing concerns about the low HIV testing rates among adult men compared to women (WHO et al., 2013). Adolescents have less access to HIV testing and counselling services than adults, but many studies have documented similar gender patterns in testing (Pettifor et al., 2005; MacPhail et al., 2009; Ramirez-Avila et al., 2012; Peltzer and Matseke, 2013; Idele et al., 2014). Based on data from 2006 to 2012, HIV testing rates among boys aged 15–19 in ESA were estimated at 20% compared to 29% among girls of the same age (Idele et al., 2014). In SSA between 2005 and 2009, only about 4% of boys and 6% of girls aged 15–19 (ratio of 1:1.5) tested for HIV and received the test results in the prior 12 months, and while the proportion tested increased in both age groups between 2010 and 2015, the gender disparities also increased (9% of boys and 14% of girls; ratio of 1:1.6) (UNICEF, 2016b). A similar trend of increasing testing rates among adolescents coupled with increasing gender disparities was seen in South Africa's national surveys, with 17.7% of male and 32.7% of female sexually experienced youth aged 15–24 ever having been tested for HIV in 2003 (ratio of 1:1.9) compared with 36.3% and 75.5% in 2008, respectively (ratio of 1:2.1) (Peltzer and Matseke, 2013). The lower testing rates among ABYM is an important gap to address, given that HIV testing is the gateway to treatment access. The gap may be due to several factors, including masculine norms which dissuade men from using health services (Skovdal et al., 2011; Wyrod, 2011), women's greater use of health services because of pregnancy, and insufficiently targeted male prevention programmes.

As with adults, gender differences in HIV testing among adolescents may be related to early pregnancy, as pregnant women of all ages are tested as part of antenatal care (Idele et al., 2014). An analysis from South Africa's 2003 national survey data of predictors of ever having tested for HIV among sexually active 15–24-year-olds found that ever having talked to a parent about HIV/AIDS, having participated in loveLife (an HIV education and prevention program), and higher frequency of health clinic visits were significantly associated with having been tested among both ABYM and AGYW. Ever having been pregnant, urban residence, and ever having initiated a conversation about HIV/AIDS were predictors of having been tested among AGYW only. Knowing someone who died of AIDS, older age, and having completed high school were predictors of having been tested for ABYM only (MacPhail et al., 2009; Peltzer and Matseke, 2013). In a 2006–2007 household serosurvey in Tanzania in which voluntary testing and counselling was offered, 15–24-year-old ABYM were significantly less likely to accept testing than men aged 25–34, but this was not the case for AGYW in relation to older women. An intervention in Zambia that offered door-to-door HIV testing to 15–19-year-old adolescents found that the most common reason for refusing among younger adolescents was that they did not feel they were at risk for HIV (37% of males and 32% of females age 15), and among 19-year-old adolescents, the most common reason for refusing was having tested recently (35% males and 44% females) (Shanaube et al., 2017). A study in Mozambique among 16–20-year-old adolescents recruited from two schools found that boys were less likely to have ever been tested (19.1% vs 46.7% of girls), although they were more likely to perceive themselves as being at risk for HIV infection (46% vs 28.6% of girls) (Hector et al., 2018).

Restrictions related to the age of consent for testing can hinder access to HIV testing and other health services for both ABYM and AGYW (Fox et al., 2013; WHO et al., 2013). Depending on the ESA country, the age of consent for HIV testing ranges from 12 to 18, with three countries having no law or policy and two countries not defining an age of consent (Armstrong et al., 2018). However, a number of countries include conditions under which minors can provide consent despite not being of legal age. Pregnancy is one such exception in a number of countries (Fox et al., 2013). In a qualitative study among 13–18-year-olds and their caregivers who were recruited from healthcare clinics in Kenya, both boys and girls wanted the power to consent to HIV testing without needing a guardian's permission. However, their caregivers felt that they should be notified of the HIV test results even if the adolescent under their care did not want to share them (Wilson et al., 2017). Other studies in Kenya among healthcare providers found that many were uncomfortable providing HIV testing and counselling services to adolescents. Their concerns included doubts about younger adolescents' autonomy to consent and fear they would inappropriately disclose their HIV-positive test results and be stigmatized, uncertainty that adolescents

would adhere to providers' advice given during counselling and testing, and the providers' own lack of confidence in counselling and communication with adolescents in general (Godia et al., 2013; Wagner et al., 2018).

The intervention landscape

Biomedical prevention strategies

Pre-exposure prophylaxis (PrEP)

In 2018 the US Food and Drug Administration (FDA) and World Health Organization (WHO) expanded approval of Truvada (emtricitabine/tenofovir disoproxil fumarate) as pre-exposure prophylaxis (PrEP) against HIV to include its use by adolescents at risk (Gilead Sciences, 2018). Nevertheless, PrEP data relevant to adolescents are lacking (World Health Organization, 2016), including guidelines around episodic use (Elsesser et al., 2016) and key information about how to promote PrEP uptake and adherence. One US study found that PrEP adherence decreased among adolescent men who have sex with men (MSM) as the frequency of follow-up visits decreased (Hosek et al., 2017). A study in South Africa also found decreased adherence over time (Gill et al., 2017) and no evidence of increased risky sexual behaviour (which was a possibility if individuals felt PrEP completely prevented HIV infection) over a three-month period on PrEP among male and female adolescents (Maljaars et al., 2017).

There are multiple barriers to PrEP uptake for adolescents (Koechlin et al., 2017). On the one hand, service providers have difficulties in identifying PrEP-eligible adolescents and can be reluctant to prescribe without parental consent. On the other hand, adolescents' own discomfort and lack of confidence can constrain them from seeking use of PrEP. Long-term adherence may be a major challenge because of developmental issues, but this is not yet known.

Voluntary medical male circumcision (VMMC)

VMMC was associated with an approximate 60% reduction in HIV acquisition in RCTs in SSA (Auvert et al., 2005; Bailey et al., 2007; Gray et al., 2007). Expansion of VMMC is an essential component of the joint UNAIDS strategy for ending AIDS by 2030 (UNAIDS, 2014; Hines et al., 2017; UNAIDS and WHO, 2018). Nearly 15 million VMMCs in 14 ESA countries were performed between 2007 and 2017 and are expected to avert over 500,000 new infections by 2030.

Overall, younger men seem to have more favourable attitudes towards VMMC. This has been evident in the numbers of younger men undergoing circumcision in Tanzania, Eswatini, Kenya and Uganda (Westercamp

et al., 2012; Ashengo et al., 2014; Hines et al., 2017). Studies have shown that acceptability among young people is highest when the targeted age groups conform to those ages among whom traditional circumcision is usually performed (Ngalande et al., 2006). Following evidence that uptake was considerably higher in 10–14-year-old boys than in older males, in 2016 the WHO and UNAIDS developed a new strategy that incorporates VMMC as an integral component of public health services for young men. Similar to HIV testing and accessing PrEP, this shift in prioritization of age groups has required changes to consent laws in some ESA countries, reducing the requirements for parental permission (Herman-Roloff et al., 2011). For some ABYM, VMMC is an entry point for accessing other health services.

Peers and trusted adults may be able to encourage ABYM to take up VMMC by emphasizing the ancillary benefits that some endorse, most commonly penile hygiene (Weiss et al., 2008; Mbonye et al., 2016) and sexual potency (Peltzer and Kanta, 2009). These benefits are often part of promotional campaigns, such as the Make-the-Cut-Plus trial in Zimbabwe, a sports campaign designed to increase VMMC uptake among secondary school boys aged 14–20 (DeCelles et al., 2016). Both this study and a Uganda study (Miiro et al., 2017) found that strong bonding between interested boys and a circumcised coach, who discussed circumcision and its health benefits, was important to the motivation of ABYM to undergo VMMC. In other studies, the social network of the ABYM was demonstrated to be an influential source regarding the decision to undergo VMMC, particularly for adolescents, and peers have been shown to alleviate concerns about pain and to promote the benefits in terms of sexual pleasure (Montaño et al., 2014; Osaki et al., 2015; Lilleston et al., 2017). Some studies have shown that parents and other family members also wield influence on young ABYM decisions on VMMC (Mugwanya et al., 2011; Jayeoba et al., 2012). In Botswana, after an informational session, most parents encouraged VMMC for their sons (Jayeoba et al., 2012), although the majority felt that the son should be the principal decision-maker. Conversely, in other studies, parents found it challenging to support VMMC and were reluctant to counsel due in part to their discomfort in talking about sex with their sons as well as concern that their sons would be stigmatised if VMMC was conditional upon HIV testing (Dam et al., 2018). For example, in a study in Uganda, most parents preferred infant circumcision, with only 5% wanting 11–15-year-olds to be circumcised (Mugwanya et al., 2011). The contexts for parental influence remain unclear but deserve further evaluation.

Barriers to accessing VMMC services can depend on age, as concerns about VMMC among older ABYM differ from those of younger ABYM, where the latter seem to worry primarily about pain (George et al., 2014), time away from school, and poor quality or unsafe services. Among older, married ABYM, wives are an important source of influence, and some of these men report that their wives may refuse to have sex with uncircumcised partners (Price et al., 2014; Osaki et al., 2015; Lilleston et al., 2017).

Older ABYM also worried about costs and time not working (Evens et al., 2014), as well as that the recovery time would give their spouses licence to engage in sexual activity outside the partnership. All ABYM indicated concern about long-term erectile problems (Jayeoba et al., 2012). Financial incentives have had some success in supporting older ABYM to miss work to undergo the procedure; it is unclear if these are as effective in younger males. Finally, some data suggest that beliefs about upholding traditional circumcision affect acceptability and uptake of VMMC; for example if VMMC is performed in a hospital, it is difficult to perform traditional circumcision rituals (Mshana et al., 2011).

Despite concerns about sexual risk compensation (increase in risky behaviours after circumcision), evidence-based research in real-world settings does not appear to support this. For example, a study in KwaZulu-Natal found no evidence of increased sexual risk behaviours (number of sex partners, condom use, transactional sex) or decreased HIV risk perception in a 12-month period following VMMC among secondary school male students (Govender et al., 2018).

Interventions to increase testing rates among ABYM

A number of studies have evaluated the impact of door-to-door, home-based HIV testing on HIV testing rates. Results show that making HIV testing available at home increases testing rates substantially among adolescents as well as adults and also seems to decrease gender disparities in testing. Studies of door-to-door HIV testing campaigns with ABYM from South Africa, Malawi, Zambia and Uganda have shown high acceptance rates, ranging from 85.6% to 99% (Were et al., 2006; Angotti et al., 2009; Isingo et al., 2012; Naik et al., 2012; Govindasamy et al., 2015; Shanaube et al., 2017).

A study conducted among 15–24-year-old AGYW and ABYM in Tanzania showed significant differences in the effectiveness of two different methods of HIV testing but no substantive gender differences in testing uptake. The study offered HIV testing after conducting interviews with participants in a central location within the community, either using an opt-out approach that involved the interviewer offering HIV counselling and testing immediately following the interview, which individuals could decline, or an opt-in approach, in which after completing the interview, participants were told that they could access HIV testing in a room down the hall. Among both ABYM and AGYW and across age bands, the opt-out approach was associated with much higher testing rates than the opt-in approach (Baisley et al., 2012).

HIV self-testing (HIVST) may be an approach to increase testing coverage among adolescents. A study that recruited adolescents from two schools in Mozambique and offered them directly assisted oral HIVST through two youth-friendly clinics found that although not statistically significant, females were more likely to test than males (OR = 1.30, 95% CI = 0.79–2.13) (Hector et al., 2018).

Interventions to alter behaviours or exposures that increase risk*Interventions to reduce IPV*

Although a number of systematic reviews of interventions to address IPV have been conducted, of the interventions included in these reviews, only the Stepping Stones intervention in South Africa reported data for young men (Jewkes et al., 2008). An evaluation of this program, which used participatory learning to improve HIV prevention practices and enhance relationship skills, found that the intervention lowered the incidence of herpes infection (HSV-2) among men and women and decreased reported IPV perpetration, transactional sex, and problem drinking after a 12-month period among men but had no effect on lowering HIV incidence among men and women. An intervention that combined Stepping Stones with an economic empowerment component in Uganda (SHARE) and that included participants aged 15–49 showed a reduction in IPV and overall HIV incidence over a 16-month period (Wagman et al., 2015). Of the 4746 male participants, approximately 27% ($n = 1305$) were aged 15–24. Even though SHARE did not stratify results by age, the large proportion of young men and the promising reductions in IPV and HIV incidence suggest that this intervention may be effective among ABYM. Interventions in Ethiopia and Kenya have reported changes in HIV risk behaviours for young men, for example, increased HIV knowledge, improved condom negotiations, reductions in partner violence, and endorsement of more equitable gender norms (Pulerwitz, Michaelis, Verma et al., 2010; Pulerwitz, Michaelis, Weiss et al., 2010).

School-based interventions

Sexuality education, either as part of the standard school curriculum or through focused HIV risk-reduction interventions in school settings, has long been viewed as an excellent approach for transmitting the knowledge, attitudes and skills necessary to reduce HIV-related risk behaviours to adolescents in low- and middle-income countries (Kirby et al., 2006, 2007; Adelekan, 2017). School-based interventions have the potential to reach large numbers of young people, to influence social norms of an entire youth cohort, and to alter key determinants of risk before youth become sexually active.

Systematic reviews of school-based interventions in SSA, both in earlier (Gallant and Maticka-Tyndale, 2004; Paul-Ebhohimhen et al., 2008; Harrison et al., 2010; Michielsen et al., 2010; Napierala Mavedzenge et al., 2011) and more recent years (Sani et al., 2016), have concluded that school-based interventions can be effective at increasing knowledge, positive attitudes towards protective sexual behaviours and self-efficacy to enact these behaviours, and there is some evidence that they have a positive effect on

self-reported protective sexual behaviours (Sani et al., 2016). In a recent meta-analysis, effective school-based interventions were more often adapted from other programmes, were theory-based, included provision of health services and activities outside school, and were monitored to ensure they were implemented according to protocol (Sani et al., 2016). Despite the encouraging results of this meta-analysis, one-half of the school-based interventions included in the review did not show statistically significant positive effects on protective sexual behaviours. Identified reasons for the limited effectiveness of programs included teacher resistance and/or poor skills to teach sexuality-focused curricula and limited ability of schools alone to alter deeply ingrained cultural norms and values around sexual behaviour (Maticka-Tyndale et al., 2007; Adelekan, 2017).

Few school-based interventions have evaluated effects on STI or other biological outcomes. A recent Cochrane review and meta-analysis (not restricted to SSA) concluded that six studies with these outcomes (three of which were in SSA) provided no demonstrable evidence of an effect on prevalence of HIV or other STIs (Mason-Jones et al., 2016).

Whether school-based interventions have differential effects for young men versus young women is unknown. Curricula for school-based interventions typically are the same for both girls and boys, and the intervention is delivered to girls and boys together, although results may be reported separately by gender. We reviewed 20 school-based interventions that were conducted in ESA in 2005 or later, which were identified from among those included in the two most recent systematic reviews of such interventions (Mason-Jones et al., 2016; Sani et al., 2016) and two identified elsewhere (Harrison et al., 2012; Maticka-Tyndale et al., 2014). Of these, nine reported results disaggregated by gender or tested if an intervention effect was present for both boys and girls. Even though an earlier review and meta-analysis reported that condom use at last sex only increased among males (Michielsen et al., 2010), we found no consistent pattern of differential intervention effects by gender.

Cash transfers

Interventions using cash transfers – either an unconditional benefit or a benefit conditional on achieving a specific behaviour or outcome – have often been adopted to mitigate the effects of poverty and gender inequalities on elevated risk for HIV infection among AGYW (United Nations Development Programme, 2014). Only a few studies have been conducted to assess the effects of these programs on boys. Considering unconditional cash transfers, three studies have evaluated whether state-sponsored social benefits programs, which provide cash to low-income households with eligible children, affect youth sexual risk behaviours. Two studies found significant effects among girls but not among boys. These included a study of Kenya's cash transfer program for orphans and vulnerable children, which

observed that girls in cash-transfer households delayed sexual debut, and a South African study, which found lower prevalence and incidence of transactional and age-disparate sex among girls in households receiving cash transfers (Cluver et al., 2013). However, the third study found that whereas cash transfers along with provision of free school meals and/or food gardens reduced HIV risk behaviours among girls but not boys, an intervention that also included positive parenting and teacher support components led to substantial reductions in HIV risk behaviours among both girls and boys (Cluver et al., 2014).

Considering conditional cash transfer (CCT) interventions, the Rewarding Sexually Transmitted Infection Prevention and Control in Tanzania (RESPECT) project randomized 2399 rural Tanzanians aged 18–30 (and spouses aged 16 or over) to one of two conditions that provided cash incentives dependent on negative test results from periodic screenings for curable STIs (de Walque et al., 2014). The intervention demonstrated that compared with those in the control arm (no incentives), those in the arm that received a thrice-yearly \$20 incentive for remaining STI-negative had lower incidence of STIs, but those that received a \$10 incentive did not. There was no difference in effect between males and females, but significantly, a follow-up survey one year after completion of the intervention showed sustained effectiveness among young men but not among young women (de Walque et al., 2014). In contrast, a study in Malawi that provided cash on the condition that individuals stayed HIV-negative over the course of one year had no significant effect on remaining HIV-negative (Kohler and Thornton, 2012). However, the cash incentives in this study were smaller than those in RESPECT, which might account for the lack of effect. Yet shortly after the final payment, men who had received the incentive increased risky sex, whereas women decreased risky sexual behaviour. An RCT in Lesotho also produced mixed results. It involved 3426 young adults, men and women, who were randomly assigned to a control arm or to one of two intervention arms. Both intervention arms provided participants with a lottery ticket every four months with a chance to win either \$50 (low-incentive arm) or \$100 (high-incentive arm) conditional on testing negative for curable STIs (Björkman Nyqvist et al., 2015). An evaluation after two years of implementing the intervention revealed an overall 21.4% reduction in HIV incidence as well as reductions in curable STIs. However, there was no significant reduction in HIV incidence in men alone, although the study was not well-powered to detect differences by gender.

Moving forward to address gaps

Achieving an AIDS-free generation requires actively engaging ABYM in HIV prevention interventions that have optimal impact, documenting unmet prevention needs, and outlining an onward blueprint for research. Regrettably, there are many research and programmatic gaps.

The following list highlights key gaps and suggests some strategies to address them.

- 1 Analytic shortcomings contribute to lack of understanding of the determinants of risk behaviours among ABYM (Amoateng et al., 2013; Tenkorang and Maticka-Tyndale, 2014b). Few studies provide gender- and age-disaggregated data and other contextual factors, making it difficult to identify salient beliefs, attitudes, and behaviours to target among ABYM overall and among specific age groups, and to design gender-, age- and developmentally-appropriate HIV prevention strategies. Specifically, analyses of disaggregated age data across five-year age bands (10–14, 15–19, and 20–24) and by gender are needed to allow for more nuanced understanding of risk and prevention practices of ABYM for the design of HIV programmes and tackling the adolescent AIDS epidemic – a need underscored by UNICEF and UNAIDS (UNAIDS, 2016a; UNICEF, 2016c).
- 2 There is a dearth of studies of sub-populations of ABYM, especially adolescents 10–14 years of age. Young adolescents may be neglected because of age of consent requirements for research participation without parental permission (often 18 years and older), making it more cumbersome for researchers to obtain ethics approval, and by adolescents' unwillingness to participate due to confidentiality concerns. Additionally, studies are few among sexual minority adolescents, especially among young men who have sex with men, which is perhaps not surprising given the stigmatisation of homosexuality in most ESA countries (Carroll and Mendos, 2017).
- 3 Across SSA, adolescents have less access to HIV testing and counseling than adults because the legal age of consent for HIV testing is a barrier (Fox et al., 2013; WHO et al., 2013). However, ABYM are even less likely to access HIV testing compared to their female counterparts (UNICEF, 2013; Idele et al., 2014; UNICEF, 2016a). Pregnancy at an early age may explain some of this discrepancy as it circumvents the age of consent for girls in some countries (MacPhail et al., 2009; Fox et al., 2013; Idele et al., 2014), but health-seeking behaviour is another likely explanation. Interventions that make HIV testing immediately available at home have generally been associated with high uptake and little or no gender disparity (Were et al., 2006; Angotti et al., 2009; Naik et al., 2012; Govindasamy et al., 2015), whereas interventions that require young people to go to a clinic for directly assisted oral HIV self-testing yielded non-statistically significant but lower uptake among boys than girls (Hector et al., 2018).

More research is needed to identify barriers and facilitators to HIV testing among ABYM in order to develop interventions to increase their testing rates, decrease gender disparities and initiate positive HIV testing habits that may continue throughout life (Govindasamy

et al., 2015). Tailored interventions to make testing more accessible and friendly to ABYM, such as home-based testing, and in social contexts where ABYM congregate, such as sports fields, workplace, and secondary schools and tertiary institutions, may be effective in increasing uptake of testing and counselling services by ABYM. At the same time, ongoing training of healthcare providers is essential to creating a conducive environment for ABYM-friendly services.

- 4 Most studies of adolescent sexual behaviour in ESA focus on individual-level risk factors and behaviour. While some studies recognize the importance of contextual factors, few examine how factors such as parental monitoring, interactions with peers and teachers, family structure and family socio-economic status influence sexual risk.
- 5 Targeting adolescent boys at ages when they are developing behavioural patterns that will endure throughout adulthood is essential for transforming masculinity from harmful masculine practices and enacting positive gender-equitable social norms. With transition to adulthood, adolescents begin to develop an understanding of their current and future roles and responsibilities in society (Erikson, 1959). It is at this critical transitional juncture that they develop the behaviours – including risky and sometimes violent as well as protective practices – which they may continue to engage in throughout their adult lives. For younger adolescent boys, we need to understand their experiences with masculine norms and focus interventions around the time of sexual debut. Interventions that address sexual health communications between parents/guardians and adolescents might be a pragmatic approach.
- 6 To support the global movement to expand and upgrade comprehensive sexuality education for youth, additional research is needed to identify curricula that, beyond improving knowledge, can alter skills and behaviours (UNFPA, 2015). Special attention needs to be given to identifying and addressing the unmet sexual health needs of young men and to promoting gender-equitable norms among both young men and women.
- 7 More research is needed on the differential effects among girls and boys on cash incentives to promote staying in school and performing specific health-related behaviours.
- 8 Addressing the gap in IPV and HIV research among ABYM is critical given gender differences in adolescent development and HIV risk. Research on IPV has shown that it is easier to prevent than treat. A series of interventions has targeted women and men, but less research has focused on ABYM. Therefore, it is vital to offer interventions that target and are tailored to ABYM at a young age (O’Leary et al., 2012). Future research should report age-stratified findings to determine what IPV interventions may be most effective for ABYM.

In addition, IPV among MSM and transgender youth has been understudied, especially in ESA. Research in South Africa has included predominantly adult MSM, primarily of White/European racial identity and gay sexual identity (Stephenson et al., 2011). Strategies are needed to ascertain the prevalence of IPV (both experience and perpetration) among non-white MSM in ESA, especially those under 18 years of age.

- 9 Interventions for ABYM must be youth-centric and grounded in the realities of youth's lives, fully engaging and mobilizing them in intervention development. A youth-centred design strategy, which entails understanding user needs and insights, ideation (brainstorming creative solutions, building representation of ideas [prototypes]) and implementation (sharing prototypes with users and obtaining feedback and refining intervention) to co-design innovative interventions with youth, is increasingly being applied in global health programs and should become the norm (IDEO.org, 2014; Vechakul et al., 2015).
- 10 Use of male peer-driven and social network intervention models may be effective in reaching ABYM given the importance of peer norms. AGYW could also serve as champions for their male partners' health, encouraging them to seek prevention services.
- 11 Establishment of dedicated male sexual health clinics may be an effective way to reach ABYM who have sex with men and who would otherwise forgo seeking public health services.
- 12 As part of combination HIV prevention, PrEP should be integrated into ABYM-friendly sexual health services, with outreach to older at-risk youth in sports clubs and youth centres.
- 13 The association of anxiety and depression with lower condom use and greater likelihood of sexual partner concurrency highlights the need for addressing mental health issues and for exploring the feasibility of integrating mental health components into HIV prevention interventions for ABYM.
- 14 Anal sex needs to be explicitly discussed in age-appropriate adolescent HIV prevention and sexual health programming (Ybarra et al., 2018).

In sum, ABYM must be part of the solution to interrupt the cycle of HIV transmission. Even though ABYM are at lower risk than AGYW for HIV acquisition, they are not at zero risk due to their risk-taking behaviours. Culturally reinforced masculinities that encourage male dominance, along with men's inability to uphold these gendered expectations within the context of structural inequalities, ultimately contribute to HIV risk among both ABYM and AGYW. As adolescent boys grow older, their risk of HIV exposure and transmission increases. Given that gender socialization occurs during early adolescence, it is important to target boys to engender sexual health and equitable gender norms.

The new MenStar Coalition launched by Sir Elton John and the Duke of Sussex in 2018 at the 22nd International AIDS Conference in Amsterdam

specifically seeks to engage men in HIV epidemic control, and it is supported by committed funding of over USD 1.2 billion (MenStar Coalition, 2018). No single intervention will likely suffice to stem the HIV epidemic. Rather, a combination of biomedical, behavioural and structural interventions that target not only HIV risk behaviours but also upstream factors associated with risk behaviour, such as poverty and harmful masculine norms, will be needed. A recent editorial in the *Lancet* reminds us that “being gender blind benefits neither men nor women” and calls attention to how machismo can increase risk-taking behaviour and deter boys and men from accessing health services (“Gender and health,” 2018).

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