HIV prevalence and related behaviours of older people in Botswana — secondary analysis of the Botswana AIDS Impact Survey (BAIS) IV

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The focus of HIV interventions in Botswana, a country with the second highest prevalence of HIV in the world, remains targeted at those aged 15–49 years despite a growing cohort of older people living with the disease — driven largely by the successful roll-out of antiretroviral therapy (ART). Primarily utilising the Botswana AIDS Impact Survey IV, we set out to examine HIV related characteristics and behaviours of this often ignored older cohort (50–64 years) relative to younger (25–49 years) adults. Analysis revealed that more than 80% of older people living with HIV were on ART. HIV prevalence among this older cohort was 24.6% in 2013 compared to 35.1% among the younger cohort, \( p < 0.0001 \). Prevalence in older adults was higher among older males (27.8%) than females (21.9%), \( p = 0.02 \). Furthermore, 58.9% of older adults acknowledged being sexually active, with 59.0% of these admitting to inconsistent condom use during sexual intercourse. In addition to this low condom usage, older men (6.0%) were significantly more likely to be unaware of their HIV-positive status than older women (3.0%), \( p = 0.002 \). While HIV prevalence showed a dramatic increase among older men over time (17.2% in 2004, to 23.4% in 2008, to 27.8% in 2013), the trend was flatter among older women (16.3% in 2004, to 22.4% in 2008, to 21.9% in 2013). These trends are likely attributable to a large increase in ART coverage and uptake. Going forward, more targeted interventions acknowledging the ageing epidemic are important to consider.

Keywords: ageing and HIV, co-morbidities, HIV prevalence, older adults in Botswana, prolonged ART use, sexual behaviour and characteristics

Online supplementary material: Supplementary data are available at https://doi.org/10.2989/16085906.2018.1552162

Introduction

Advances in antiretroviral therapy (ART) have transformed HIV into a chronic illness, leading to the emergence of a large global population aging with the disease (Mills, Barnighausen, & Negin, 2012; Negin, Martinuk et al., 2012; UNAIDS, 2011). Tackling HIV among this aging population is increasingly being recognised as one of the key components to controlling HIV currently and in the future (Mahy, Autenrieth, Staneci, & Wynd, 2014; UNAIDS, 2013, 2014). The UNAIDS Gap Report (2014) recognised older adults as a group left behind by the current response, estimating the number of people living with HIV (PLWH) above the age of 50 years at 4.2 million, the bulk of whom (60%) reside in sub-Saharan Africa (Mahy et al., 2014; UNAIDS, 2014).

While the number of people aged 50 years and above makes up less than 10% of the entire population of most sub-Saharan African countries, this is projected to rise dramatically over the next couple of years (Mahy et al., 2014; UNAIDS, 2013, 2014; Velkoff & Kowa, 2006). Recent studies point to the existence of an older African population aging with HIV and often unaware of treatment options and availability and with inadequate access to health services (High et al., 2012; Negin, Barnighausen, Lundgren, & Mills, 2012; Negin, Nemser, et al., 2012; Negin et al., 2011; Work Group for the HIV & Aging Consensus Project, 2012). Recent estimates of the prevalence of HIV infection among the approximately 74 million people aged 50 years or older in sub-Saharan African were reported to be relatively similar to those aged 15–49 years, standing at 4.0% versus 5.0% respectively (Negin & Cumming, 2010). Some of the countries in sub-Saharan Africa with the highest documented proportion of older adults living with HIV included Mozambique, Nigeria, South Africa, Zambia and Zimbabwe, which together account for 54% of the total number of older PLWH (Negin & Cumming, 2010; UNAIDS, 2014). A study from western Kenya suggested that 17% of the mortality among people older than 50 years of age was likely related to HIV related (Negin, Wariero, Cumming, Mutuo, & Pronyk, 2010). The evidence describes an older adult population living with HIV which also experiences high rates of co morbidity illnesses (Mahy et al., 2014; Mills et al., 2012; Morabia & Abel, 2006; Negin & Cumming, 2010; Negin, Martinuk, et al., 2012; Negin, Nemser, et
al., 2012; Negin et al., 2011; UNAIDS, 2014). Failure to comprehensively recognise this imminent challenge points to a lack of understanding of the health implications of living in older age with HIV.

While Botswana has the second highest prevalence of HIV in the world (Farahani et al., 2014; UNDP, 2012), and one of the oldest and most successful life-prolonging ART programmes in Africa, a gap in literature on the presentation, manifestation and characteristics of HIV in older people in this setting exists (Reid, Haverkamp, McAllister, Miller, & Kirk, 2014). Despite the reduced AIDS related mortality and increasing life expectancy, the focus of HIV interventions in Botswana remains focused on managing the diseases as a generalised epidemic. This approach emphasises specific demographics such as pregnant mothers, younger people and the sexually active population, often classified as those aged 15–49 years (Kandala, Campbell, Rakgoasi, Madi-Segwagwe, & Fako, 2012; Nair, 2008). This often excludes older adults as a subgroup of particular interest despite the recognition by the Joint United Nations Programme on HIV/AIDS (UNAIDS) of adults aged 50 years and older as one of the 12 groups often marginalised in HIV treatment and prevention efforts (The Global Fund, 2014; UNAIDS, 2014). Furthermore, substantial evidence on the levels and correlates of HIV prevalence and incidence in Botswana to date remain largely based on studies in young and middle-aged populations as is the case in most sub-Saharan African countries (Keetile, 2014).

As people age with HIV, however, solving problems related to the successful management of the epidemic, ongoing treatment, prevention of other secondary ailments and ensuing challenges requires more knowledge and targeted approaches specific to the setting in which the challenges play out. The aging epidemic needs to be contextualised and intervention strategies moulded to address the socio-cultural, psychosocial, and personal factors reflected. This study examines HIV prevalence and related behaviours of this older cohort (50–64 years) in Botswana relative to the younger (25–49 years) cohort to better understand the challenges posed by this growing yet under-acknowledged group.

Methods

Data description

We primarily utilised the Botswana AIDS Impact Survey IV (BAIS IV) (Republic of Botswana Ministry of Health, NACA, & Central Statistics Office, 2013), which is the fourth and latest of a series of national representative demographic surveys that incorporates the latest developments and trends in the country’s HIV epidemic. The data used in this study belong to the Ministry of Health Botswana, the National AIDS Coordinating Agency (NACA), and the Botswana Central Statistics Office. It was utilised in our study to analyse HIV related characteristics, prevalence and behavioural patterns of the population aged 25–64 years. In addition to dried blood spot samples collected from the sampled households for subsequent HIV testing, questionnaires from BAIS IV 2013 included information on demographics; marriage and cohabiting partnerships; sexual history and behaviour; sexually transmitted diseases; knowledge about HIV and AIDS and level of exposure to interventions; and attitudes towards PLWH (Republic of Botswana Ministry of Health et al., 2013).

The demographics of older adults living with HIV, HIV prevalence, sexual behaviour, and awareness of HIV status of older adults versus younger adults were assessed. Overall, there were 5 118 eligible respondents aged 25–64 years.

The Botswana AIDS Impact Survey II (BAIS II) (Republic of Botswana Ministry of Health, NACA, & Central Statistics Office, 2004) and the Botswana AIDS Impact Survey III (BAIS III) (Republic of Botswana Ministry of Health, NACA, & Central Statistics Office, 2008), which used similar testing algorithms and questions as BAIS IV, were also used to assess the HIV prevalence trends.

Ethics

Although this was a secondary analysis of data, ethical approval was granted by the health research ethics review board of the Ministry of Health of Botswana, (Reference No: HPDME: 13/18/1 Vol. X (300)). The study therefore was treated in accordance with the ethical guidelines and requirements of human research ethics as stipulated by the Botswana Ministry of Health. The data analysed were anonymised.

Statistical analysis

All data were analysed using Statistical Analysis Software (SAS) (version 9.4 SAS Institute Inc.). As BAIS is intended as a nationally representative survey, we used the BAIS sampling weights in analysis to compute the national prevalence estimates, the associated behaviour, knowledge, attitudes, and trends associated with the HIV epidemic, prevention and impact mitigation amongst the population aged 25–64 years (2004–2013) in Botswana (BAIS II, III, IV).

Comparisons of demographic and background characteristics of the study population were drawn, using simple cross tabulation to provide a systematic breakdown and differences between the age groups; 25–49 (younger adults) and 50–64 years (older adults) age groups. Because the two age groups had substantially different sex/gender compositions, the analyses were also explored by gender/sex where appropriate. These characteristics were presented as unweighted frequencies (the raw number of respondents to the survey) as well as weighted frequencies (percentages that were statistically adjusted to account for the overall national population). The distributions of demographics and sexual behavioural characteristics between the age groups stratified by HIV status and sex were compared using the $\chi^2$ test of association. All $p$-values were two-sided. No adjustment was made for multiple comparisons and exact $p$-values were calculated. Accepted statistical significance of results was set at $p < 0.05$.

Results

Figure 1 shows a comparison of HIV prevalence estimates between 2004, 2008 and 2013. While HIV prevalence was flat among older women between 2008 (22.2%) and 2013 (21.9%), among older men it steadily increased from 2004 (17.2%) to 2013 (27.8%).
Demographics

In total, data from 5 118 BAIS IV respondents were used in this study. Categorising the data according to age demographics, as defined in this study, 1 858 respondents (36.3 %) were males aged 25–49 years, 446 (8.7%) were males aged 50–64, 2 290 (44.7%) were females aged 25–49 and 524 (10.2%) were females aged 50–64 years. Demographic comparisons (Table 1) revealed significant differences in the older populations than in younger populations. Older men and older women had lower levels of education than did their younger counterparts. While three-quarters of older people had only a primary education or less, more than 70% of those aged 25–49 completed secondary education or higher. Irrespective of sex, older people were more likely to live in rural areas than younger people, two-thirds of whom, in fact, resided in urban areas.

Table 1: Demographics of respondents by sex and age group, 2013

| Variable                  | Men 25–49 years | Men 50–64 years | Women 25–49 years | Women 50–64 years |
|---------------------------|-----------------|-----------------|-------------------|-------------------|
|                           | Weighted %      | Weighted %      | Weighted %        | Weighted %        |
|                           | (unweighted N)  | (unweighted N)  | (unweighted N)    | (unweighted N)    |
| Total percentage in population | 23.8 (1 858) | 6.3 (446) | 30.2 (2 290) | 8.3 (524) |
| Education                |                |                |                   |                   |
| Primary or less           | 29.3 (487)     | 75.0 (328)     | 24.4 (536)        | 76.7 (405)        |
| Secondary                | 43.5 (817)     | 9.8 (58)       | 52.3 (1 214)      | 10.3 (58)         |
| Higher                   | 27.2 (554)     | 15.2 (60)      | 23.3 (540)        | 13.0 (61)         |
| Region of residence      |                |                |                   |                   |
| Urban areas              | 64.6 (1 208)   | 49.3 (230)     | 69.5 (1 526)      | 57.0 (261)        |
| Rural areas              | 35.4 (650)     | 50.7 (216)     | 30.5 (764)        | 43.0 (263)        |
| Marital status           |                |                |                   |                   |
| Married/living together  | 52.5 (969)     | 70.8 (310)     | 52.0 (1 178)      | 51.0 (249)        |
| Single                   | 46.2 (798)     | 21.6 (79)      | 43.4 (938)        | 32.4 (161)        |
| Divorced/separated       | 0.7 (14)       | 4.0 (23)       | 2.2 (41)          | 4.8 (21)          |
| Widowed                  | 0.6 (10)       | 3.7 (17)       | 2.4 (45)          | 11.8 (61)         |

Figure 1: HIV prevalence among men and women 25–64 years over time (2004, 2008, 2013), by age group and sex (n=5 118). Confidence intervals available in supplementary Table S1.
When grouped by HIV status and sex (Table 2), older HIV-positive men had less education than those who were HIV-negative \( (p = 0.01) \). More of the older HIV-positive men were uncircumcised than older HIV-negative men \( (p = 0.02) \). More of the older HIV-positive women were widowed than their HIV-negative counterparts \( (20.5\% \text{ compared to } 9.5\%) \).

### HIV prevalence and ART use

The prevalence of HIV was higher among younger women \( (37.8\%) \) than it was among older women \( (21.9\%, \ p < 0.0001) \) but did not differ statistically between younger and older men (Table 3). Of the total number of people who were tested for HIV in the 12 months before the BAIS IV data collection, fewer older adults were tested than younger adults. Within those who were confirmed as HIV-positive, older HIV-positive men were significantly more aware of their HIV status than younger HIV-positive men \( (86.4\% \text{ vs } 60.9\%; \ p = 0.0105) \). Additionally, more HIV-positive older men and older HIV-positive women were on ART than their younger counterparts (though this difference was statistically not significant).

#### Sexual behaviour

While over 75% of older men, younger men and females aged 25–49 reported engaging in sexual intercourse the year before, less than 50% of older females regardless of HIV status reported engaging in sexual intercourse over the duration of the past year (Table 4). Drawing comparison within age groups, HIV-negative people were more unlikely to use condoms when compared to their HIV-positive counterparts. For example, 65.7% of older HIV-negative females and 69.7% of HIV-negative males reported inconsistent condom use with regular partners compared to 40.9% and 23.6% of older HIV-positive females and males respectively. Although statistically not significant, women regardless of age and HIV status were slightly more likely to engage in sexual intercourse for which they did not give consent than their male counterparts. Older HIV-positive men reported having more sexual partners than older HIV-negative men: 15.9% of HIV-positive men aged 50–64 reported having multiple sexual partners, a proportion almost double that of HIV-negative (7.1%) men in the same age category.

### Table 3: HIV prevalence and proportions of awareness of HIV status by sex and age group, 2013

| Variable                        | HIV-positive Men 25–49 years (n = 1 564) | HIV-positive Women 25–49 years (n = 2 123) | HIV-positive Men 50–64 years (n = 318) | HIV-positive Women 50–64 years (n = 401) | 25–49 years (n = 1 564) | 25–49 years (n = 2 123) |
|--------------------------------|----------------------------------------|------------------------------------------|---------------------------------------|----------------------------------------|------------------------|------------------------|
| **HIV prevalence based on blood test** | 30.3 (28.7–32.1) | 27.8 (23.1–29.3) | 64.0 (61.3–66.8) | 56.7 (53.2–60.1) | 0.5 | 37.8 (35.2–38.9) | 21.9 (18.3–23.3) |
| **% tested in past 12 months (of those who did not know their HIV-positive status)** | 60.9 (58.2–61.9) | 86.4 (82.8–89.3) | 75.3 (73.6–77.0) | 82.6 (80.3–85.0) | 0.002 | 92.2 (90.7–93.4) | 92.1 (90.2–94.3) |
| **% HIV-positive and aware of their HIV-positive status** | 58.2 (58.2–61.9) | 82.8 (82.8–89.3) | 75.3 (73.6–77.0) | 82.6 (80.3–85.0) | 0.01 | 90.7 (90.7–93.4) | 85.2 (82.4–88.1) |
| **% HIV-positive people on ART** | 73.6 (73.6–77.0) | 80.3 (80.3–85.0) | 75.3 (73.6–77.0) | 82.6 (80.3–85.0) | 0.3 | 77.0 (75.8–78.1) | 85.2 (82.4–88.1) |
Close comparison of related data from BAIS III and BAIS IV suggested positive changes in behaviour over time. The percentage of younger males reporting being circumcised increased from 15.7% in 2008 to 27% in 2013. This trend was similarly evident amongst older males, reporting increased circumcision rates noted as 17.6% and 33.4% in 2008 and 2013 respectively. While older HIV-negative people used condoms sparingly as observed in Table 4 and, as previously noted, older adults had increased condom use overall. They reported a marked increase in condom use, rising from 18.6% in 2008 to 41.9% in 2013. However, such dramatic change was not reflected in the younger cohort. Nevertheless, the figures for this younger group were higher than those of older adults: 48.2% in 2008 versus 50.5% in 2013.

When considering some attitudes of the adult population towards important HIV issues (Table 5), over 90% of respondents, across all ages and sex, accurately indicated the importance of correct and consistent condom use. A little over 50% of older adults, however, showed less concern about getting infected with HIV since the introduction of antiretrovirals (ARVs). Generally, all the groups, especially the younger cohorts, projected a reasonable level of knowledge and comprehension and a positive attitude towards HIV.

**Discussion**

The long and sustained HIV epidemic in Botswana is undergoing a demographic transformation ushering in a diverse cohort of older people living with HIV. This includes those living in the areas of sub-Saharan Africa (Mahy et al., 2014). An increase has been observed in African women aged above 50 years, particularly those living in rural areas (Clark et al., 2015; Gomez-Olive, Thorogood, Clark, Kahn, & Tollman, 2013; Negin, Negin, Nemser, et al., 2012). It showed a rise in the proportion of older women and men living with HIV in Botswana over time. Of note was the difference in magnitude of the increase in prevalence between the two older sexes with HIV prevalence among older males being higher than that of their female counterparts, an outcome slightly different from previous outcomes documented in reports such as the 2014 UNAIDS Gap Report (UNAIDS, 2014) and other studies in some parts of sub-Saharan Africa (Mahy et al., 2014). An increase has been observed in African women aged above 50 years, particularly those living in rural areas (Clark et al., 2015; Gomez-Olive, Thorogood, Clark, Kahn, & Tollman, 2013; Negin, Negin, Nemser, et al., 2012). These differences within the sexes could suggest a need for further investigation to fully elucidate the dynamics of HIV within this population.

Despite this observed increasing HIV prevalence in older adults in Botswana, reported as 24.6% in this study — higher than the national HIV prevalence of 18.5% — older people continue to receive very little attention specific to them as a vulnerable population in the national HIV response (NACA, 2015; UNAIDS, 2014). To date, the indicators often used in the national response to HIV remain primarily focused

### Table 4: Sexual behaviour and characteristics by HIV status and age, 2013

| | Men (%) | Women (%) |
|---|---|---|
| | All older vs all younger | Old HIV+ vs Old HIV− |
| **25–49 years** | | |
| HIV+ | HIV− | HIV+ | HIV− |
| N | 363 | 990 | 363 | 176 | 288 | 110 | 139 | 45 | 196 | 41 | 146 | 218 | 63 | 98 | 23 | 55 | 12 |
| Had sexual intercourse in past 12 months | 87.6 (316) | 88.4 (871) | 79.3 (60) | 79.4 (183) | 0.01 | 0.9 | 79.3 (516) | 87 (910) | 33.6 (31) | 48.3 (152) | 0.02 | 0.05 |
| Sexual intercourse without consent in past 12 months | 2.6 (8) | 2.0 (17) | 2.6 (2) | 1.0 (3) | 0.2 | 0.3 | 2.6 (16) | 2.0 (31) | 2.5 (2) | 1.0 (5) | 0.1 | 0.3 |
| Ability/tendency to negotiate condom use all the time | 74.0 (260) | 76.2 (697) | 65.9 (61) | 69.7 (126) | 0.03 | 0.03 | 75.3 (460) | 69.6 (700) | 66.8 (60) | 69.7 (126) | 0.03 | 0.03 |
| Inconsistent or no condom use with main partner in the past 12 months | 29.8 (110) | 38.7 (86) | 236.6 (60) | 69.7 (126) | 0.03 | 0.3 | 32.0 (170) | 45.5 (471) | 40.9 (11) | 65.7 (149) | 0.02 | 0.08 |
| Had more than one sexual partner in past 12 months | 13.0 (41) | 29.0 (229) | 15.0 (9) | 7.1 (18) | 0.03 | 0.1 | 14.5 (6) | 18.3 (13) | 0.03 | 0.02 |
| Inconsistent or no condom use with secondary partner in past 12 months | 19.6 (11) | 21.7 (65) | 8.3 (1) | 55.3 (7) | 0.03 | 0.1 | 23.4 (66) | 11.2 (67) | 10.2 (4) | 11.3 (12) | 0.04 | 0.07 |
| Reported more than one of sexually transmitted infection associated symptoms | 23.3 (46) | 11.2 (67) | 10.2 (4) | 11.3 (12) | 0.04 | 0.07 | 13.7 (51) | 17.6 (70) | 10.5 (4) | 11.3 (12) | 0.04 | 0.07 |
Table 5: Percentages of selected attitudes and knowledge of Botswana adult population towards HIV

|                                | Men                      | Women                    |
|--------------------------------|--------------------------|--------------------------|
|                                | 25–49 (n = 1 858)        | 50–64 (n = 446)          | 25–49 (n = 2 290)        | 50–64 (n = 524)        |
| Percentage who accurately report that it is possible for a healthy looking person to have HIV | 85.8                     | 80.7                     | 86                      | 80.4                    |
| Percentage who accurately report that correct and consistent use of condoms during sexual intercourse can reduce the chances of getting HIV | 93.7                     | 90.3                     | 95.3                    | 90.3                    |
| Percentage who accurately report that you cannot get HIV because of witchcraft | 80.9                     | 71.6                     | 84.9                    | 73.1                    |
| Percentage who accurately report that people on ART should always use a condom during sexual intercourse | 91.7                     | 86.1                     | 89.1                    | 85.9                    |
| Percentage who accurately report that people on ARVs should continue and not stop taking them once they feel better | 91.6                     | 89                      | 93.4                    | 90.7                    |
| Percentage who accurately report that a woman has the right to force the man to use condoms during sexual intercourse | 92.4                     | 88.6                     | 94.6                    | 89.2                    |
| Percentage who accurately report that it should be acceptable for a man to obtain female condoms | 79.3                     | 69.8                     | 85.3                    | 78.2                    |
| Percentage who accurately report that circumcised male should continue using condoms during sexual intercourse | 86.7                     | 81.4                     | 88.5                    | 73.4                    |
| Percentage of people less concerned with getting HIV since the introduction of ARVs | 57.6                     | 54.1                     | 55.9                    | 55.8                    |

on children and adults younger than 50 years old (Mathlo, Lebelonyane, Driscoll, & Negin, 2017; Republic of Botswana Ministry of Health et al., 2013).

Botswana’s successful ART programme, reported here as far reaching and covering over 80% of eligible patients nationally, is widely credited with transforming HIV into a chronic illness, enabling people infected with HIV to live increasingly longer lives (Bakanda et al., 2011; Negin et al., 2011; Ramiah & Reich, 2005; UNAIDS, 2010; Sidibe, 2011; UNAIDS, 2011; WHO, 2015). The trends point to an inevitable accumulation and increase in the proportion of older PLWH over time. For example, the noticeable high proportion of PLWH in their forties signals this imminent surge in the number of PLWH over the age of 50, within the next decade. This trend can in fact be expected across sub-Saharan African countries as they continue to improve and increase ART access (Hontelez et al., 2012). Moreover, the emerging trends observed in this study and documented in other sub-Saharan African countries such as South Africa, Malawi and Kenya (Negin & Cumming, 2010; Pillay & Maharaj, 2013) is in fact due to not only the cumulative years of survival (on ART) for those who acquired the infection when they were young, but also partly attributable to the newly acquired infection in older age by some.

There are currently no age contextualised health interventions that provide or promote clinically meaningful care aimed specifically at older adults in Botswana. In light of this increasing population of older PLWH in the country, however, a long-term perspective aimed to optimise a holistic treatment care strategy for older PLWH is essential. There is need to illuminate and better understand the health challenges posed by long-term HIV exposure and prolonged treatment and side effects in this setting. The biomedical complexities presented by aging with HIV have been noted in several studies. For example, a study by High et al. (2012), reported impaired daily functioning, increased frailty, poor engagement and retention in care, and a greater number of physical and psychological comorbid health conditions and challenges that aging coupled with HIV may present (High et al., 2012; Negin, Martiniuk, et al., 2012). To avoid likely complications due to HIV and aging induced comorbidities and/or the natural occurrence of other acute and chronic illness associated with aging in Botswana, proper management and systems need to be put in place.

This study also singled out women as having lower levels of education and lower levels of HIV related knowledge, thereby increasing the likelihood of taking uninformed decisions and making risky choices that expose them to HIV. This suggests that educational support, knowledge exposure and dissemination should be a priority intervention for older women in particular. The observation was in line with findings from other studies that have described the marginalisation of older women, who are often denied social and emotional support, despite experiencing many social challenges including HIV, and AIDS related bereavements (Negin, Nemser, et al., 2012; Sia et al., 2016). This underlines the likely progress that could be made by targeted messaging and prevention programmes tailored and mindful of the disposition of specific groups. For example, the successful use of circumcision as a supplementary preventative measure targeted at HIV-negative men. Improvements in circumcision rates and condom use between 2008 and 2013 as seen in this study could indeed be reflective of this additional national HIV prevention strategy which introduced targeted safe male circumcision alongside condom use (Ministry of Health Botswana, 2009). While HIV pre-exposure prophylaxis (PreP), whose success in preventing HIV transmission has recently been demonstrated in many trials on key and/or vulnerable populations around the world, would be ideal to counter risk behaviour by older negative people in this setting, it is yet to be rolled out in Botswana (Jain, Krakower, & Mayer, 2015; Kelesidis & Landovitz, 2011; Landers & Kapadia, 2017; Sundareshan & Koirala, 2018). Safer sex knowledge...
dissemination, although not sufficient on its own, remains the only available counter intervention. It therefore needs to be thoroughly comprehensive and targeted. Messaging on prevention needs to address factors such as alcohol and substance use, and psychosocial factors such as anxiety and depression which have been reported, in related studies, to result in high risk sexual behaviour including unprotected sex (Bagheri Lankarani, Zarei, & Joulaei, 2017; Coates, Richter, & Caceres, 2008; Schweitzer, Mizwa, & Ross, 2010).

Our study highlighted other systemic challenges faced by older people in Botswana. A greater percentage of older men, compared to older women, were reported to either be married or in consensual unions signifying that older men were more likely than older women to have support in the form of a partner. This observation, however, was to some extent at odds with some studies that have suggested that marriage offered a stable sexual network and thus reduced HIV acquisition and HIV mortality (Kposowa, 2013; Magadi, 2011). While these observations from previous studies could be true within the context in which they were performed, our findings further expand our understanding of the effect of marital status on HIV. Noteworthy also was the flat increase in HIV prevalence of older women versus the significant increase in the proportion of infected older men. In addition to more HIV-negative older men reported using condoms inconsistently with either primary and or secondary partners, the observation could also highlight the existence of unacknowledged embedded complex sexual relationships or encounters outside what is considered normal within the context of marriage or consensual unions in Botswana (Nleya & Segale, 2013; Radzikowski, 2011). Older men compared to women, may be engaging in high risk sexual encounters that are ambiguous and less accounted for in the HIV surveillance efforts in Botswana (Keetile, 2014; Radzikowski, 2011).

While this study included what is considered to be the best representative data on HIV in Botswana, we acknowledge the lack of data regarding those aged 65 years and above. This group represents 35% of all people above the age of 50 years in Botswana (Statistics Botswana, 2011), meaning we might possibly be underestimating the true impact of HIV on the aged.

Conclusion
This study underscored the disposition of the older adult HIV population in Botswana, elucidating the challenges they face as they navigate an entrenched subliminal culture that tends to disregard their particular needs. It is important that all those involved in the management of HIV infection recognise and address these factors that may potentially improve treatment and care for older adults, thereby enhancing prevention of HIV in Botswana. This means recognising not only the clinical changes but also the unique social, behavioural and economic stance of older people in society. After all, older adults do not only remain sexually active, some may in fact, be involved in complex and often secretive intergenerational relationships, putting them at risk of contracting HIV in later life and spreading the infection, in the case of those who are HIV-positive.

Acknowledgments — The authors of this paper acknowledge the assistance rendered by the National AIDS Coordinating Agency (NACA) and Statistics Botswana, in availing and allowing access to the primary raw data used in this study.

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