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How to “live a good life”: Aging and HIV testing in rural South Africa

Enid Schatz, PhD^{a,b,c}, Brian Houle, PhD^{b,c,d}, Sanyu A. Mojola, PhD^{c,e,f}, Nicole Angotti, PhD^{b,c,g}, and Jill Williams, PhD^c

^aDepartment of Health Sciences, University of Missouri

^bMRC/Wits Rural Public Health and Health Transitions Research Unit (Agincourt), School of Public Health, Faculty of Health Sciences, University of the Witwatersrand, South Africa

^cInstitute of Behavioral Science, University of Colorado, Boulder, CO, USA

^dSchool of Demography, The Australian National University, Australia

^eDepartment of Sociology, University of Colorado, Boulder, CO, USA

^fDepartment of Sociology, University of Michigan, Ann Arbor, MI, USA

^gDepartment of Sociology, American University, Washington, D.C., USA

Abstract

Objectives—The African HIV epidemic is aging, yet testing behavior studies either exclude older persons or include too few to say much about age differences.

Methods—Strategically combining focus group interviews (participants in 40s/50s/60s-plus) and survey data from rural South Africa (where HIV prevalence peaks in the late 30s, but continues to be over 10% into the late 60s), we examine gender and life course variation, motivations and barriers in HIV testing.

Results—We find significant gender differences—women test at higher rates at younger ages, men at older ages. Our qualitative data highlight recognition of testing importance, but also suggest gendered motivations and perceptions of testing. Men and women report similar barriers, however, including fear of finding out their HIV status, limited confidentiality, and partner non-disclosure.

Discussion—We conclude with recommendations to increase HIV testing uptake among older adults including home-testing, couple-testing, and HIV testing concurrently with noncommunicable diseases.

Keywords

Focus Groups; HIV Testing; Mixed methods; HIV Prevention policy; South Africa; Aging

INTRODUCTION

The number *and* prevalence of older South Africans living with HIV is increasing (Mutevedzi & Newell, 2014); this is due to individuals living longer and thus surviving with HIV into older ages on anti-retroviral treatment (ART), as well as acquiring new infections at older ages (Harling, Newell, Tanser, & Bärnighausen, 2015; Wallrauch, Bärnighausen, & Newell, 2010). Small scale studies have estimated HIV prevalence between 16.5%-20% among those aged 50-plus in rural South Africa (Gómez-Olivé, Angotti, et al., 2013; Rosenberg et al., 2017), and HIV prevalence of between 20–33% among those in their 40s (Camlin et al., 2010). Despite these sobering statistics, research on older persons' experiences with HIV testing remains limited (Rohr et al., 2017). Existing research suggests older Africans are not testing for HIV (Maughan-Brown, Lloyd, Bor, & Venkataramani, 2016), or test only once they are quite sick (Cornell et al., 2015; Snow, Madalane, & Poulsen, 2010). Little is known, however, about their motivations for or barriers to HIV testing. In this paper, we examine the prevalence of ever-testing and age at last-test among those who have ever-tested for HIV drawing on 2010–2011 survey data. We then use focus group interviews (FGIs) from 2013 to explore factors associated with decisions to test or not as individuals transition from middle to older ages. Our study takes place in the Agincourt Health and socio-Demographic Surveillance Site (HDSS), located in the Agincourt sub-district, Mpumalanga Province, South Africa.

Exploring testing behavior and views of those aged 40-plus is critical in light of this setting's HIV prevalence, which remains high into older ages. As shown by Gómez-Olivé et al. (2013), HIV prevalence among men ages 40–59 is 30–40%, falls to 15–20% in their 60s and 5% in their 70s. Women's pattern at older ages differs slightly, with a steady decline at older ages from 35% prevalence among women in their 40s to 25% in their 50s to 5–12% in their 60s and 70s.

HIV testing is a necessary prerequisite to enabling individuals to access ART, and is particularly important in light of the World Health Organization's (WHO) test and treat guidelines and the United Nation's goal to have 90% diagnosed, 90% on treatment and 90% with viral suppression by 2020 (UNAIDS, 2014). Middle-aged and older adults, however, may be lagging in both testing and treatment. Systematic analysis of clinics in Mpumalanga suggests that even after a massive testing service scale-up – starting with 25 Voluntary Counseling and Testing sites in 2001, and increasing to 250 sites by 2006 –older adults tested at low rates compared to younger cohorts. Among those aged 50 and over, only about 6% of women and 12% of men had had an HIV test (Snow et al., 2010). The concomitant roll out of ART was slow in our study site. ART was available in the three public hospitals in the area in 2004, in some clinics in 2008, and more widely by 2011 (Mee et al., 2014). Thus our 2010 survey data, and 2013 FGIs, capture a new rationale for HIV testing during the early years following widespread ART availability.

Overall, the majority of HIV testing studies focus on younger adults' and pregnant women's experiences (e.g., Angotti, Dionne, & Gaydos, 2011; de Bruyn & Paxton, 2005). Thus, HIV testing barriers at younger ages are well-documented – e.g., fear of partners' reactions and stigma of diagnosis (Gage & Ali, 2005; Namakhoma et al., 2010). In rural areas in

particular, other important barriers include direct and opportunity costs associated with travel to distant health facilities and long clinic wait times (Angotti et al., 2009). While persons aged 40-plus are likely to experience some of these barriers, they may have different motivations and barriers to testing as they transition from middle to older ages, and women in particular age out of routine incidental testing. Older men may also be less likely than younger men to be exposed to workplace testing (Mojola, Williams, Angotti, & Gómez-Olivé, 2015). A study in the early 2000s in Uganda, for example, showed that men ages 30–59 had lower rates of ever-testing or being willing to test than younger men, despite the potential accumulated risk of more lifetime partners (Gage & Ali, 2005). While accumulated risk may be high, older adults' testing is largely accounted for by medical referrals, suggesting a significant portion are only tested once symptomatic (Snow et al., 2010).

In this paper, we take a mixed methods approach. We use survey data to examine HIV testing trends by gender and age, as well as examine factors associated with HIV testing. We then analyze qualitative focus group data to investigate older adults' motivations, concerns and beliefs about testing. Rather than expecting a perfect match between testing behavior and normative beliefs about testing, or even a single coherent version of what testing means and why people should do it, instead we use the survey and FGI data to highlight the multidimensionality of lived realities and the contradictions that emerge (Mason, 2006). We explore the complex ways older South Africans make sense of testing, their ability to hold multiple beliefs simultaneously, and how these beliefs do not correspond perfectly with the survey data. Further, these ideas are dynamic and influenced by demographic characteristics – barriers to testing likely shift as men and women transition from middle to older ages; we thus expect that testing behavior and motivations will vary by gender and life stage.

METHODS

Study setting

We use data from two studies conducted in the Agincourt site—an HIV prevalence survey and community-based focus group interviews (FGIs). The study area covered 27 villages at the time of the study — approximately 15,600 households and 89,000 individuals. Characteristics of the study area are similar to other rural areas in South Africa: limited subsistence agriculture and high rates of unemployment mean that many households are dependent on migrants' remittances and government sponsored social grants (Collinson, 2010; Twine, Collinson, Polzer, & Kahn, 2007).

Quantitative Data

The 2010–2011 cross-sectional survey included 7662 respondents ages 15-plus randomly sampled from the Agincourt HDSS 2009 census stratified by age and sex. An oversample of 284 persons age 50-plus ensured sufficient numbers for analysis. The response rate for the overall sample was 65.7% (see Gómez-Olivé, Angotti, et al., 2013 for additional details on sampling, non-responders, and study design). We focus on two survey questions: Have you ever been tested for HIV? and When were you tested the last time (year and month)? As part of the survey, respondents were tested for HIV (and could return separately for results), but self-reported HIV status was not asked. We use inverse probability sampling weights (IPSW)

to adjust for nonresponse, based on a logistic regression to model factors influencing study participation. We include predictors from the HDSS 2009 census of sex, age group (as of August 2010), an interaction between sex and age ($p < 0.001$), quintiles of the 2009 household socioeconomic status index, union status, an interaction between union status and sex ($p = 0.001$), education in years, self-identified national-origin (Mozambican or South African), and the identity (ID) number assigned to each survey fieldworker (Houle et al., 2015). We assessed the balance of the covariates between the participants and non-participants using the IPSW (Austin & Stuart, 2015) – the largest absolute standardized difference was 6%. We derive the final weights for our analyses by multiplying the calculated IPSW for nonresponse by the inverse probability weights from the sample selection (Baffour et al., 2016). We use logistic regression to model sociodemographic risk factors for reporting having ever tested for HIV. We include predictors of sex, age group, quintiles of the 2009 household socioeconomic status index (Kabudula et al., 2016), union status, education in years, employment status, and self-identified national-origin.

Qualitative Data

The nine FGIs, stratified by age group (40s, 50s, 60s-plus) and gender (men, women, mixed), were conducted in 2013. The FGIs included 5–12 participants each; a total of 77 individuals from seven Agincourt villages participated. The participants in each were as follows: M40s – 5 men; W40s – 9 women; M/W40s – 3 men, 6 women; M50s – 8 men; W50s – 11 women; M/W50s – 4 men, 5 women; M60s – 12 men; W60s – 6 women; M/W60s-plus – 4 men, 4 women. Respondents were recruited from local gathering places such as markets, taxi ranks, and home verandahs, and were asked to bring 2–3 same age and gender peers to the focus group. A team of two – a facilitator, who lead and moderated the discussion, and a note-taker – fielded each FGI, which lasted 2–3 hours, was audio-recorded, and then translated by the local research team from XiTsonga/Shangaan (the local language) to English.

The FGI instrument – which aimed to address community norms and institutional environments in which older adults live and make decisions about their health as they age in an era of HIV – consisted of semi-structured questions as well as hypothetical vignettes featuring situations and scenarios of similarly aged older men and women. Topics included norms and discourses around sexual behavior and aging; discourses and dominant expectations around the key social roles, institutions and life events unique to adults at different points in the transition to old age; and the collective community experience of apartheid and post-apartheid change.

All respondents provided informed consent. The authors' institutions and the Mpumalanga Provincial Government Department of Health, South Africa provided ethical clearance.

Analytic Approach

We analyzed the quantitative and qualitative data separately, then combined and triangulated findings (Creswell, Klassen, Plano Clark, & Clegg, 2011). Prevalence of ever-testing and age at last-test were calculated by sex and age in Stata 14, using the combined calculated IPSW for nonresponse and the inverse probability weights from the sample selection. The

qualitative FGI analysis consisted of deductive (for themes of prior interest) and inductive (for emergent themes) coding in Nvivo 10, drawing on elements of grounded theory (Strauss & Corbin, 1990). The authors worked together to build coding consensus, and agreement on the meaning of the themes. Inductive analysis included outputting Nvivo reports on ‘testing’, coding text with sub-themes, and drafting memos of the emerging themes within and across FGIs. We examine the ways that those in their 40s, 50s and 60s-plus discuss HIV testing, focusing on their stated barriers to and motivations for testing. We look for similarities and differences across age groups and by gender to assess whether a common view of testing exists or if age and/or gender influences the ways middle-aged and older adults view HIV testing. We also compare consistency in age and gender trends across the two data sources.

RESULTS

Survey Results: Gender and Life course variation in HIV Testing

Table 1 shows the sociodemographic characteristics of the survey population by gender among those who responded to the question about having ever had an HIV test. As illustrated in Figure 1, HIV testing prevalence varies across the life course. Most women in reproductive ages have ever-tested for HIV: 69% of young women (15–19), 84% of women 20–29, and 82% of women 30–39. This is consistent with reproductive health visit routine incidental testing (de Bruyn & Paxton, 2005). Older women, who are not regularly captured by incidental testing, however, have a lower prevalence of ever-testing: 64% of those in their 40s, 52% of those in their 50s, 29% of those in their 60s-plus, and 16% in their 70s have ever-tested. This trend in testing prevalence by cohort is consistent with the timing of the AIDS epidemic, which peaked in the site in 2005.

Among men, reports of ever-testing among those 15–59 are significantly lower than same-aged women: 16% of teenage men ($p<0.001$), 35% of men in their 20s ($p<0.001$), about half of those in their 30s ($p<0.001$) and 40s ($p=0.005$), and 46% in their 50s ($p=0.262$) report ever-testing. However, a significantly higher percentage of men than women in their 60s and 70s report ever-testing (40% vs. 29% in ages 60–69, $p=0.014$; 25% vs. 16% in ages 70-plus, $p=0.009$); men may have participated in workplace testing earlier in their lives. Indeed, it is only at older ages that men’s prevalence of ever-testing equalizes (in their 50s) and then surpasses women’s testing prevalence.

Figure 2 shows patterns in time since last-test among people aged 40-plus who reported having ever-tested for HIV. Among both men and women aged 40-plus who reported having ever-tested for HIV, the majority tested within the year or 1–2 years prior to the survey. Thus, the majority tested at older ages, not earlier in their lives. For ages 40–49, 50–59, and 60–69, the median time since last test was 1 year, and was less than 1 year for those aged 70 and above. When comparing those with a recent test (<1, 1–2 years) compared with those with a less proximate test (3+ years), there are few gender differences. HIV testing at older ages, particularly after age 40 for women and age 50 for men, is likely to reflect voluntary testing or medical referrals, given a lower likelihood of exposure to routine incidental testing (women) or workplace testing (men).

Our logistic regression analyses estimated factors associated with reporting ever testing for HIV (Table 2). An interaction between sex and age significantly improved model fit ($p < 0.001$). Men under age 50 had significantly lower odds of reporting ever testing compared to women. Men and women ages 50–59 ($p = 0.17$) and 70-plus ($p = 0.08$) had similar odds of reporting ever testing, while for ages 60–69, men had higher odds of reporting ever testing compared to women ($p = 0.027$). These results confirm findings in Figure 1 and 2. In examining socio-demographic characteristics, those with some (1–11 years) and the highest (12+ years) education had increased odds of reporting having ever tested for HIV compared to those with no education, but there was no significant difference in reporting testing between those with some and the highest education ($p = 0.12$). Those currently in a union reported higher odds of testing compared to those not in a union. Further, neither employment, wealth nor self-identified nationality were significantly associated with HIV testing.

Focus Group Interviews: Motivations for testing

After experiencing a decade and a half of excess mortality and widowhood due to AIDS, older adults in this setting were highly aware of the prevalence of HIV in their community (Houle, Clark, Gómez-Olivé, Kahn, & Tollman, 2014). Thus, it is perhaps unsurprising that FGI participants mentioned a number of reasons that they themselves were motivated to test for HIV. As with many complex concepts, however, individuals' cognitive reasoning and outlining of their beliefs about HIV testing do not necessarily align with their actual health behaviors. Individuals' sense making around the realities of HIV are not always congruous and straightforward from the outside, or at least, are not always directly in line with bio-medical recommendations and "rational behavior" (Liddell, Barrett, & Bydawell, 2005; Schatz, Gilbert, & McDonald, 2013). And, as we see, their stated beliefs did not necessarily match up with the health behaviors and correlated factors captured in the survey data.

Participants were aware that HIV testing was relevant to them. A participant in a FGI among men in their 50s said, "[We must go and test.] Even though we are old. Because we are still having sex." Indeed, two core narratives emerging from our FGI analysis were (a) the importance of testing and knowing one's status regardless of age, and (b) the dangers associated with ignorance of one's HIV status and spreading HIV to others. In response to a question about HIV testing in older ages, participants in a mixed-gender FGI of people in their 60s-plus noted:

M5: Life is nice that is why it is important to test.

W2: You will know that you are ok or not.

M5: Even if I use a walking stick I will go and test.

Men in their 50s had a discussion about what might prompt someone to go for an HIV test, even in the absence of symptoms:

M8: [It] is because if you are a human being and having sex, you have to go for an HIV test so that you know your status because in these days we are living the biggest problem is HIV. That's why we go for HIV test.

M5: Sometimes you do feel it in your body. No one has to tell, you just have to go to clinic and do an HIV test.

M4: It is important, even if you do not feel any pain you have to go and do an HIV test. So it is important that you know your status.

M8: It's important to know your status because if you know your HIV status, you start to live a good life.

Testing in order to “live a good life” was a theme that made it clear that the now widespread access to ART – and the belief that it can restore one's health and longevity – created a strong motivation for testing and knowing one's status. This belief reflects reality, as life expectancy in this province has increased from 52.7 years among men and 56.3 years among women in 2001–2006, up to 59.5 years among men and 65.1 years among women in 2011–16: StatsSA attributes this increase to uptake of ART over time (Statistics South Africa, 2017).

A mixed-gender FGI of people in their 40s were asked about the importance of people their age knowing their HIV status; they had this exchange:

W4: Haah... according to me I think it is good. [*All agree.*] It is good because I will be able to take care of myself and live many years...

W6: And it doesn't kill. It's not like the flu, mmm...

M3: It is important because when I know my status I will get treated and they will give me medicine or pills and I will take them.

W6: It is important to know your status that you have this virus or not and when you have it you must also test how your CD4 counts decreased or how it is so that you can be able to take good care of yourself and follow the rules and eat vegetables and fruits.

Similarly, a respondent from a FGI among women in their 50s remarked:

W2: I think it is important [to know your status] because when I normally go for HIV testing and when they find I'm HIV positive, I will manage to take treatment early. ... And you won't even see that I'm HIV positive when I walk around. The problem is people want to know their status when they have lost [a]lot of weight and when everybody can see that there's a problem and that's not good... test while you are strong.

A woman 60-plus likewise observed, “They want to know their HIV status so that when they are positive, they can get ARVs early.” These examples show that across age groups, and whether discussing with same-sex peers or in mixed groups, men and women attested to the importance of knowing one's status, testing before symptoms arise, and getting on ARTs in order to “live a good life”. Respondents felt that *both* men and women needed to test, as illustrated by this exchange among men in their 50s:

M8: It is important if you want to know your HIV status especially if you have family so you can take care of yourself.

Facilitator: It's important to male or females?

M6: In all of us it's important to test.

This single story of wanting and needing to know one's status to "live a good life" certainly would lead one to overestimate the percentage of older adults who have ever-tested (about 60% in their 40s, half in 50s, a third in 60s, and 20% of those 70-plus). Further, themes related to gendered motivations for, as well as barriers to testing, do not easily align with the survey data, as we show next.

Gendered motivations for testing—The majority of men and women aged 50-plus did not test. Despite their claims about the importance of testing, many do not see themselves as "at risk," and thus do not feel compelled to test. Indeed, a majority of older women in this setting report not having current sexual partners (Mojola et al., 2015). The lack of sexual partners, and thus reasonably muted sense of risk, may contribute to the lower prevalence of ever- and last-test among older women compared to men (shown in Figures 1 and 2).

In the FGIs, however, a different gender pattern emerges. While in general both men and women claim that testing is important, unlike in the survey data, women *and* men say that women at all ages, including older ages, are more likely to test than men. In a FGI with women in their 60s and above, ages at which survey data suggest men out-test women in both last- and ever-testing, participants declared that women are more open to testing than men. The FGIs further reveal gendered reasons and rhetoric about who participants believe *should* and *does* test and why. These shed some light on the gap between FGI participants' perceptions and the survey findings.

Men's motivations: Sex and sickness—Protecting oneself and one's partner was an important reason participants gave for going to test. In some cases, this was outlined as equally important for men and women. In a FGI of men in their 60s-plus, one respondent reflected, "I can say it is fifty-fifty, to me it is important to know my status that I have the illness. Also my wife it is important to her to know if she has HIV so that she can protect herself and I protect myself too. I take it equally."

Not all discussions highlighted similarities between men and women in terms of their motivation for testing. Men, unlike women, reported being compelled to test due to current and past sexual behavior, particularly with non-marital partners. A group of men in their 50s had an extensive conversation about whether men are expected to stop having sex as they age, with wives or with other women. They all laughed,

M7: No there is no stopping having sex. Its nature as long as you still want to do it [sex].

M4: To stop having sex it's when you don't have the feeling [sex drive] anymore, but I don't understand [i.e., can't imagine that happening].

The assumption was that men continue to have sex into older ages; this extended to those who were HIV positive. One participant went on to suggest that ART allows men to continue to have sex even if they are living with HIV,

M6: To stop having sex, it won't work, because they say if you have HIV and live a good life [e.g. are on ART], you can survive for a long time. ... It's not that you are no longer a human, if you are HIV [positive], you [are] still good [healthy] like other[s]. I even heard my brother here saying that he is taking ARTs and he also had a baby.

Despite admitting that men's own behavior was a factor that heightened risk of transmission, across the age groups, men also blame women as a source of getting HIV. When asked why it is important to test and know one's status, one participant in his 40s in a men-only FGI alluded to potentially unsafe partners, "If you are not protecting yourself and follow young people and some they go to taverns. Even who is going to church, you will find that she is a prostitute but she is always at church."¹ While he admitted men's behavior is also suspect, blame clearly is also put on women.

Men in their 50s admitted they too could not be trusted and deserve some blame for spreading HIV, "When you have it [HIV] you don't talk about it... This will take his/her life or spread if you will not trust her. Even us the men you will find that we have it, the women will not believe you. I will keep quiet with it." Rather than focusing on blaming women, a man 60-plus in a mixed-gender FGI was more concerned about men's past risky behavior and current symptoms, "...What makes a person test is knowing he has girlfriends everywhere and seeing that you are coughing," suggesting that past behavior or health problems can lead to testing or to encouraging others to test.

Women's motivations: the motherhood imperative—In FGIs among women, respondents felt that they were more likely to test than men because they were more responsible, or keener on knowing their status so they could initiate ART. Women in the youngest age group (40s), who were on the tail-end of reproductive ages and still at times fell into incidental testing, highlight why women their age and younger are more likely than men to test:

W3: What bound us most is because we (women) normally go to the clinic and sometimes when you are there you have to test as a parent even if you went there because of a child sometimes they do test him/her. That's why we know our status early. ... That's why we know our status first.

W2: You find that you are pregnant and when you are pregnant at the clinic they expect/want you to test. ... Even if you are not pregnant, we as women we stay at home and we don't know what our husband are doing where they are (work) sometimes it comes in my mind that let me go and check my status because I know I'm fine but I don't know my husband. As women we have rights to test and know our status, so that we can live for our children...

Thus, women see themselves as more likely to test because incidental testing connected to reproductive health services has made testing normative (Angotti et al., 2011), and because they are motivated to protect themselves and their children from their husbands' extramarital

¹In this context, "prostitution" refers to women perceived to be pursuing sex with men for mercenary reasons, not necessarily as formal sex workers.

sexual behavior. Beliefs in women's strong motivations and incidental testing may underlie the overestimation of women's higher HIV testing.

Barriers to HIV testing

While FGI participants mentioned a number of motivations for testing, they also reported reasons why they felt they could not or did not want to test. These barriers suggest further reasons for the gap between belief in the importance of testing, and low rates of testing among older adults. Interestingly, while testing motivations differed by gender, men and women across all age groups raised similar individual and couple level barriers to testing.

Confirmatory testing, stigma and privacy—A key barrier that emerged – particularly once women had aged out of their reproductive years and men were no longer accessing workplace testing – was the assumption that people only test when they are already symptomatic, or, for men in particular, because they have recent high risk behaviors (e.g. multiple, “unsafe” partners). FGI narratives suggest that participants believe HIV testing is a confirmatory process, making it frightening to test since the result is already ‘known’ (Kaler & Watkins, 2010). For example, in a FGI among men in their 40s, the facilitator asked what type of people go for HIV testing, the men responded,

M5: Mostly people are scared to do HIV testing when they are healthy.

M2: I can say that those who do HIV testing are people who don't have many sexual partners. But us who have many sexual partners we are scared to do HIV test. Me, I won't go.

While this excerpt presents testing as frightening for all, those who assume they will test positive are particularly reluctant. Despite believing that having multiple sexual partners is a sure-fire way to becoming infected (Kaler, 2003), in reality, even in an HIV endemic environment, transmission probabilities in each act of sex are low (Gray et al., 2001).

A concern about a lack of privacy in testing also emerged. Participants complained that nurses or community members might disclose one's status if seen at a ‘testing’ clinic. A respondent 60-plus in a men-only FGI observed: “They said that the nurses disclose people's status. When you come out from testing they show others signs that you are HIV positive. So you [think] that is not good. People will not go for testing, they will die at home not knowing that it is HIV.” Similarly, a respondent from an FGI among women in their 40s said, “Nurses they don't have confidentiality like the nurses from the past. That is why people are staying home until they are very sick...”

Relatedly, respondents voiced concern about the lack of privacy associated with being seen going to particular clinics associated with testing. For example, a respondent in a 50s men-only FGI noted, “Yes these days people talk a lot if they see you go to the clinic. They will say that one got HIV, even if you[‘ve] got TB or high blood.” This critique, as with the one about nurses' lack of confidentiality, are not uncommon (Angotti & Kaler, 2013). Nonetheless older persons may avoid testing until symptoms appear due to these fears, even despite participants' own rhetoric of testing early to “live a good life”.

Lack of trust and non-disclosure—While our participants said everyone should “know their status,” both male and female FGI participants highlighted the need for partners to test *and* be counseled together in order to avoid mistrust and lack of disclosure. As one woman from the 50s women-only FGI explained,

W1: Another thing is when we go for HIV tests together we must be counseled together because we want the truth about each other. If I’m counseled and tested alone, even if I’m HIV positive, I won’t tell him. We must test together so that we can be sure that we are all negative. ... I’m tested alone and he [is] also tested alone because we are afraid that people will see us. When he comes from the counseling room and he says he has nothing, I will also tell him the same.

Since testing and counseling are currently perceived as individual interventions, they have the potential to breed distrust, as there is a motivation to hide something. Shifting this notion of testing as a confidential, individual activity, may improve the likelihood of older persons’ seeking out testing.

DISCUSSION

This study used survey and FGI data to examine gender and life course variation in HIV testing uptake, barriers and motivations among older adults in a high HIV prevalence setting in rural South Africa. We find that while women test more at younger ages, a higher percentage of men than women test at older ages. Our qualitative data highlight respondents’ recognition of the importance of testing, but also suggest gendered motivations for testing – men’s ‘high-risk’ sexual behavior, and women’s status as mothers/caregivers feature into their normative understanding of reasons to test. Barriers towards testing, on the other hand, are similar for men and women: they include seeing testing as confirmatory of an HIV diagnosis, and fearing a lack of confidentiality, as well as a lack of trust and non-disclosure among couples when testing is done individually.

Situating our data—the 2010–11 survey data and FGIs from 2013—in time and place is essential. These data were collected during a time period when ART was just becoming more widely available in clinics throughout the community. Thus, some of the ambivalence we document may be, in part, a result of shifting notions of HIV as an invariably fatal disease to a chronic condition once on treatment. The lower prevalence among older age groups may also be due to cohort effects, e.g. differing views toward HIV testing across generations and less access to testing for older generations.

The relatively low prevalence of testing at older ages, and differences between men and women in testing motivation and behavior, may change as ART becomes more widespread. Our survey data were collected at a time when older South African men had a higher age at first test and were more likely than women to be referred for testing because of illness (Snow et al., 2010). Qualitative data from rural South Africa around this time also suggested that older women’s concerns about HIV included not just sexual transmission from their husbands, but also the risk of HIV acquisition from caring for an HIV-positive family member (Schatz et al., 2013). And yet, in our survey, a higher percentage of older men than older women reported having a recent test.

One reason for older persons' low testing rates, particularly among older women, may be because they do not view themselves as at risk. The majority of older women in our survey reported not having any partners in the last two years (93% of women aged 70-plus, 70% aged 60–69; 36% in their 50s)—many because they are divorced or widowed; and less than 2% of women 40-plus reported having more than one partner in the last two years (Mojola et al., 2015). Two-thirds of women aged 50-plus are widowed or divorced, compared to about a quarter of men (Gómez-Olivé, Thorogood, Clark, Kahn, & Tollman, 2013), yet older women may not account for the long incubation of HIV, or that they may have acquired HIV while still partnered.

Men were more likely to report recent sex and multiple partners; still less than 20% of men 40-plus reported multiple partners (Mojola et al., 2015). Freeman and Anglewicz (2012) similarly found among those aged 65-plus in Malawi, a quarter of women and three-quarters of men report having had sex in the last year, and the average number of sexual partners for men was above one. Thus, extramarital sex, low condom use, and cross-generational sex with people in age groups with the highest HIV prevalence in older ages (Houle et al., 2017), may mean that perceived risk and actual risk are misaligned, particularly for men.

While the majority of older persons are probably not at high risk of contracting HIV, older men's sexual behavior suggests that as they age they remain at higher risk than older women (Mojola et al., 2015). Still, it is unclear from the analyses in this paper if those who *are at risk* are the ones testing and who know their HIV status. Those who have never- tested or last-tested more than a decade ago but remain sexually active, and potentially have multiple partners, should be encouraged to test again. Thus, it is critical to know whether testing messages are reaching those at older ages who *should be testing*. Understanding men's testing behavior at older ages may be particularly important, as they tend to initiate ART treatment later than women and are more likely than women to die from AIDS (Dovel, Yeatman, Watkins, & Poulin, 2015).

The clarity with which people talk about wanting to get tested in order to know their status, and if HIV-positive, to get onto ART to “live a good life”, provides an in-road for making use of core community values in order to have older people encourage one another to get tested, especially if they have not tested recently. Our data show that while the majority of those who have tested in older ages have done so within the prior decade, over two-thirds of those in their 60s and 80% of those in their 70s reported never-testing. Calling on older persons to get tested in order to “live a good life”, not just for themselves, but also to be around to take care of themselves and others (Angotti, Mojola, Schatz, Williams, & Gómez-Olivé, 2017), could provide a strategy to increase the importance of testing among older persons, getting closer to the UN 90-90-90 goal.

As with any study, this study had limitations. First, while both data sources were collected in the same site, they were collected at different time periods and with different sampling strategies. The FGI participants were purposively sampled to reflect different age groups, genders and study villages. While our aim was to get a sense of collective norms in the study area, it is possible that different groups or configurations of individuals might have produced different results. Since we did not collect demographic data on the FGI participants, we

cannot compare them with the survey respondents to assess similarities, differences or generalizability. FGIs may also produce different responses than one-on-one interviews or observational methods (Angotti & Kaler, 2013); nonetheless, they still reflect ‘*a reality*’ of the way that individuals talk about and make sense of HIV.

Reporting of ever-testing (and age at last-test) may have been subject to recall error and/or social desirability bias, which could have contributed to the lack of congruence between the data sources. There also may be social desirability bias in the FGIs, with a greater likelihood of speaking positively about the virtues of HIV testing than in less structured research methods like ethnography, that often yield more non-normative or counter normative ideas (Angotti & Kaler, 2013).

Our survey data may have been affected by selection bias due to differential nonresponse to the survey. While we adjusted our testing estimates using IPSW, the results are sensitive to unmeasured confounding. For instance, individuals who knew they were HIV positive and those who may have recently tested HIV-negative may have been more likely to not consent to the interview – which would reduce our estimates of HIV testing. In earlier work examining HIV prevalence, we adjusted for non-response bias using Heckman selection models using fieldworker identity (ID number) as the exclusion criteria (Clark & Houle, 2014). However, we are unable to apply that approach to our testing estimates as interviewer identity may be correlated with a respondent’s HIV testing response. Despite these limitations, we believe this analysis, particularly the ability to compare data sources to expose the complexity of the issue, and the mismatch between beliefs and behaviors, makes an important contribution.

Policy Implications

HIV testing is the key entry point into the HIV care cascade (MacCarthy et al., 2015); without improvements in testing, it will not be possible to reach the UNAIDS 90-90-90 target (Church et al., 2017; UNAIDS, 2014). The combination of assuming that HIV testing is meant to be confirmatory (only happens once one is assumed to be HIV positive) with concerns about disclosure and lack of confidentiality may temper older persons’ likelihood of testing, even if they tout their desire to know their status and the importance of HIV testing. Addressing their concerns and improving privacy around care, may increase testing incidence among older persons who are potentially at risk.

Based on these results, we offer two policy suggestions for increasing the uptake of HIV testing among older adults. The first is to increase access to home-based HIV testing, and in particular, combining this with strategies that encourage couples testing. Home testing, with rapid results, provides additional privacy and reduced opportunity and financial costs for the individual, as well as decreases the likelihood of disclosure by nurses who are believed to not respect confidentiality (Angotti et al., 2009). Home-testing would further avert rumors that individuals believe stem from being seen by others at the clinic, as well as normalize testing such that it is no longer associated with being invariably HIV positive (Ameh et al., 2017). Further, while those who *are* HIV-positive will have to access ART, and thus will be seen at the clinic, the connection will be between sero-status and accessing treatment, not sero-status and testing, thus potentially reducing negative associations with the perceived

confirmatory nature of testing. Finally, home testing could be done with couples, assuaging concerns and distrust between partners/spouses stemming from individual testing.

Another suggestion for shifting the culture of testing for older persons in particular is to encourage HIV testing as part of an array of tests for non-communicable diseases (NCDs) and other common illnesses of aging. Thus, as with incidental testing, HIV testing becomes the default as people age. There are efforts in Agincourt currently to combine these two strategies, with home testing for both HIV and NCDs; future work will need to track the impact on older persons' perceptions on testing. In an area with an emerging NCD epidemic (Clark et al., 2015), and many undiagnosed individuals, this array of tests would potentially link more of those who need care to facilities for NCDs, HIV, or both.

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Figure 1.

HIV testing prevalence (95% CI) in Agincourt HDSS, 2010, by age and sex¹

¹Estimates include combined IPSW and inverse probability sampling weights.

Figure 2.

Time since last-test among those 40-plus who have ever-tested for HIV, by age and sex¹

¹Estimates include combined IPSW and inverse probability sampling weights.

Sociodemographic characteristics by sex among those who responded to survey question on having ever had an HIV test[/]**Table 1**

Variable	Women (n=2674)		Men (n=1669)		Total (n=4343)	
	N	%	N	%	N	%
Age, years						
15–19	154	14	110	18	264	16
20–29	582	28	369	38	951	32
30–39	629	16	360	14	989	15
40–49	444	14	238	10	682	12
50–59	275	10	158	7	433	9
60–69	296	7	204	6	500	7
70+	294	10	230	7	524	9
Currently in union						
No	1603	69	904	72	2507	70
Yes	1071	31	765	28	1836	30
Education, years						
0	746	23	365	12	1111	19
1–11	1440	58	1000	68	2440	61
12+	488	20	304	20	792	20
Currently employed						
No	1948	83	1072	77	3020	81
Yes	492	17	485	23	977	19
Nationality						
Other	842	31	482	30	1324	31
South African	1832	69	1187	70	3019	69
Ever tested for HIV						
No	1004	35	1002	64	2006	46
Yes	1670	65	667	36	2337	54

[/] Percentages include combined IPSW and inverse probability sampling weights and may not sum to 100% due to rounding. Totals do not equal final sample due to missing values.

Table 2Logistic regression of reporting having ever had an HIV test on sociodemographic characteristics (n=3,997)¹

	Odds Ratio	95% CI	p-value
Male	0.092	[0.050, 0.171]	<0.001
Age groups			
15–19	–	–	–
20–29	2.096	[1.354, 3.245]	0.001
30–39	1.769	[1.151, 2.719]	0.009
40–49	0.767	[0.499, 1.180]	0.228
50–59	0.551	[0.349, 0.871]	0.011
60–69	0.202	[0.128, 0.320]	<0.001
70+	0.111	[0.067, 0.186]	<0.001
Sex X Age			
Male X 20–29	1.174	[0.576, 2.394]	0.659
Male X 30–39	2.392	[1.192, 4.799]	0.014
Male X 40–49	6.352	[3.124, 12.916]	<0.001
Male X 50–59	8.11	[3.853, 17.070]	<0.001
Male X 60–69	16.935	[8.112, 35.354]	<0.001
Male X 70+	16.252	[7.516, 35.145]	<0.001
SES quintiles ²			
Low	–	–	–
Middle-low	1.199	[0.897, 1.604]	0.22
Middle	1.236	[0.928, 1.645]	0.147
Middle-high	1.11	[0.832, 1.482]	0.477
High	0.974	[0.735, 1.290]	0.853
Currently in union ²	1.238	[1.045, 1.466]	0.014
Education (years) ²			
0	–	–	–
1–11	1.405	[1.123, 1.758]	0.003
12+	1.706	[1.242, 2.342]	0.001
Currently employed ²	0.95	[0.782, 1.154]	0.605
South African ²	1.011	[0.826, 1.237]	0.916

¹Model includes combined IPSW and inverse probability sampling weights.²Data from the 2009 Agincourt HDSS census update.