‘Bury the head in the sand’: Older people in sub-Saharan Africa and sexual risk perception

Abstract

It is evident that sexual activity tends to decrease with age. Nonetheless, it is still prevalent enough to be considered a risk factor for the spread of HIV among older people. This paper investigates the perception of vulnerability to HIV infection among older people living in informal settlements of Nairobi, Kenya. The factors associated with self-perceived risks are also examined. Survey data for 2,053 individuals aged 50 years an older drawn from a larger longitudinal study are used. This is supplemented with qualitative data involving focus group discussions to provide a contextual overview of the urban slum setting and its bearing on older people’s sexuality. A large majority of older people do not consider themselves at risk of infection. Of those who felt at risk, a greater proportion sensed only a small chance of contracting HIV/AIDS. Reasons for perceiving no risk and a small chance of contracting HIV are gendered but not for perceiving moderate to great risk. Perception of risk was associated with slum, participation in social groups or voluntary community activities, religiosity, and HIV testing. Surprisingly, age, marital status and education did not independently predict risk perception. This paper recommends evaluation of older people’s self perception of vulnerability in order to best inform interventions aimed at minimising risks to HIV infection.

Introduction

Almost 3 decades since the first case of HIV and AIDS was discovered in sub-Saharan Africa, adolescents, people in the reproductive ages, and high risk groups have been the focus in HIV or AIDS discourse and policy interventions. Older people have only featured in their role as carers for orphans and people living with AIDS and hardly as people at risk of HIV infection. It is evident that sexual activity, the main route of HIV transmission in sub-Saharan Africa, tends to decrease with age. Nonetheless, it is still prevalent enough to be considered a risk factor for the spread of HIV among older people in addition to other predisposing risk factors. Given that older people are considered to be less active sexually or do not engage in risky sexual behaviour, HIV or AIDS information and education campaigns aimed at prevention and care is seldom targeted at them. Their vulnerability is therefore increased due to assumptions that they merit less attention. Older people are also excluded from multimedia prevention campaigns by virtue of the fact that majority of older people may be unable to comprehend some of the HIV/AIDS prevention messages which usually target young people and high risk groups [1-3].

There is little research however to understand how older people consider themselves exposed to the risk of HIV infection. Such studies would be significant in shaping appropriate prevention intervention for older people. This paper aims to contribute to literature on HIV/AIDS and older people in sub-Saharan Africa by examining perception of risk to HIV infection among older people living in informal settlements of Nairobi, Kenya.

Theories of risk perception

Perception of risk by lay persons has been defined as subjective and does not usually entail a logical thought process. Various mediating factors come into play when making a judgement about vulnerability to a risk hence resulting in variation across population and discrepancy between objective and subjective measures [4-6]. Different school of thought and theories have been advanced to explain the variation in risk perception with regards to health hazards including HIV/AIDS. For instance, perception of susceptibility is a major component of the Health Belief Model which seeks to understand variability in health-related behaviour [7].

The assessment of a risk by individuals is socially or culturally constructed hence is influenced by a wide range of psychological, social, institutional and cultural factors and rarely do people apply scientific or probabilistic reasoning [8-10]. The question of *how* people get infected and ill from the virus may not been shrouded in much controversy however, explanations on *why* people get infected has been rationalised based on cultural and spiritual understanding. Religion and spirituality has a strong influence on the social and everyday life of most African societies [11]. The role of religion in shaping people's attitude and beliefs regarding HIV/AIDS has been investigated in various studies as a protective factor as well as an inhibiting factor to risk protection [12-15]. Religion can be protective through its role of discouraging sexual behaviour that put people at risk of HIV infection such as multiple sexual partnership, as well as premarital, and extramarital sexual relations [16]. Conversely, spirituality and belief in a higher power's control over people's lives and destiny can result in feelings of limited control over one's life and ability to control adverse events happening including contracting HIV/AIDS. Similarly, HIV infection has been seen as a punishment for wrongdoing by decadent individuals. Consequently, most individuals would see others as the immoral ones and may not consider themselves within the group of immoral individuals thereby perceiving less personal risk [17].

The optimistic bias theory [18] put forward the notion that individuals underestimate their risk based on the belief that 'it cannot happen to me' particularly in respect to a comparison group [5] and with regards to health risks that are unusual or embarrassing [19]. Risks or risk outcomes that are stigmatised in society are more likely to be perceived with an optimistic bias [9]. People also tend to be optimistic particularly on risks that are deemed to be voluntary believing that their behaviour is within their control [8]. Most individuals claim their risk to be lower than is actually the case or to be comparatively better than their peers [18] When asked to assess personal vulnerability to a risk, individuals use different reference groups to form their opinion for instance, using people who are stereotyped to be a high-risk group for a particular adverse event [8].With regards to HIV/AIDS, high risk groups were identified in the media and general discourse to include prostitutes and their clients, and gay men [20]. People who do not identify themselves with such high risk groups feel they are at no or minimal risk of contracting HIV/AIDS [21, 22]. Even among members of these groups

identified as high risk, most would perceive themselves as less at risk while viewing others in the group as more likely to be at risk of infection [23, 24].

Decision-making about susceptibility to risks involve ideological assumptions some of which are influenced by group norms [5]. Social networks or informal groups can be a source of knowledge and can influence members to think or behave in a certain way. The constant interactions among members of a social network present with opportunities for information exchange and acquisition of new ideas. Social networks that are dense or tightly-knit do exert a strong influence on individuals and enforce norms and behaviour deemed acceptable or prevailing within the group thus resulting in similar attitude and behaviour among members of the same group. Conversely, members of a social network may systematically select themselves based on shared attitudes and preferences. A number of studies have investigated the role of social networks in influencing decisions relating to perception of risk to HIV infection, access to HIV/AIDS-related information and knowledge, and risk-related behaviour [25, 26].

In sub-Saharan Africa, different ethnic groups exhibit varying interpretations of HIV/AIDS that are influenced by beliefs and practices inherent within the ethnic group. For instance, some ethnic groups believe that people get infected by HIV because of curses or witchcraft hence they may perceive higher risk or limited control over one's probability of contracting HIV consequently making minimal behaviour-related efforts of reducing their chances of contracting HIV [27, 28]. Cultural customs such as polygamy, widow inheritance, and wife sharing practised by some ethnic groups have been shown to increase the risk of HIV infection nonetheless, concern of abiding by cultural beliefs override concern for HIV infection [29].

A biased perception of vulnerability to HIV infection is a significant predictor of decisions to engage in behaviour that reduces risk [30]. Therefore, in order to fully assess the complexity of HIV/AIDS and older people, this paper examines the factors associated with self-perceived risks among older people. Studies investigating determinants of risk are important because of the correlation between perception of risk and behaviour or action geared towards self-protection from the risk. Understanding how older people perceive their risk is key to tailoring behaviour change strategies aimed at raising awareness of people's actual susceptibility to risk, particularly if people underestimate or are overly optimistic or are unrealistic about

their level of risks [8, 10, 19, 31]. The role of socio-demographic and social interaction in the configuration of subjective risk assessment will be explored. It is hypothesised that conformity to social norms rather than rational or objective risk appraisal are significant in self-assessed risk to HIV infection among older people.

Study methodology

Study setting

The study was carried out in two slum communities in Nairobi, Kenya. The slums are located to the South East (Viwandani) and North East (Korogocho) of the city. Overall, urban areas in Kenya have consistently had a higher HIV prevalence rate (10%) compared to the rural areas (6%) with close to 40% of HIV positive people living in urban areas [32, 33]. Conversely, a great diversity exists within Nairobi with residents of low income neighbourhoods exhibiting poorer sexual health outcomes, risky sexual behaviour and consequently higher HIV prevalence rates compared with their counterparts in wealthier areas [34, 35]. The urban environment characterised by low income, migrant population, and ethnic heterogeneity also presents a context where there is little adherence to cultural norms and values regarding sexuality [36] and a more tolerant atmosphere to behaviours such as pre-marital sex [37], marital disruption [38], and short-term sexual partnering [39]. This contrasts with the social structure in rural communities which epitomises social control and regulated sexual behaviour.

Data and methods

This paper seeks to understand HIV/AIDS risk factors and perceived susceptibility to HIV/AIDS among older people by applying a mixed methods approach using qualitative and quantitative data. The qualitative data provides some insight on the context in which older people's perspectives about their sexual risks are formed. The qualitative study involved focus group discussions collected in 2004 which sought to understand the situation of older people living in the slum areas. In total, 24 groups were constituted to represent different ages and stratified by gender as well as two groups from each slum comprising community opinion leaders. These narratives are used to illustrate older people's sexuality and sexual networking based on the attitudes and opinions of the focus group participants who also included older people themselves. The data was not gathered specifically for this purpose thus secondary content analysis was performed to identify themes pertinent older people's sexuality

and which have a bearing on negative sexual outcomes particularly in contrast to a typical African rural setting.

The quantitative data is drawn from a larger longitudinal study, the Urbanization, Poverty and Health Dynamics in sub-Saharan Africa (UPHD) conducted by the African Population and Health Centre (APHRC) in the two Nairobi slums to investigate the linkage between migration, poverty and health consequences at each stage of the life-course among people living in the slums of large urban centres. The project, funded by the Wellcome Trust, is nested on the Nairobi Urban Health and Demographic Surveillance System (NUHDSS) that follows up usual residents of these two slum communities. The component of the project on older people titled 'Survey on Social, Health and Overall Wellbeing of Older People' is an on-going study that seeks to investigate the wellbeing of older people living in the slums of large urban centres. An older person is this study is defined as male or female aged 50 years or older. The cut-off age was set to correspond with the age conventionally considered outside the reproductive age of (15-49 years) and similarly outside the HIV/AIDS epidemiological surveillance of population at higher risk of infection. The baseline survey, for the cohort used in this paper, was conducted in 2006/2007 and 2,072 people were interviewed out of a possible 2,696 eligible respondents. Eligibility was determined by age (50 years and older) and residence in the demographic surveillance area at the time of the recruitment. A structured questionnaire covering several topics including HIV/AIDS was administered using face-to-face interview technique.

All the interviews (qualitative and quantitative) were conducted after obtaining a verbal and or written informed consent from the participants. The language used during the interview was Kiswahili which is the most ideal in a linguistically heterogeneous and cosmopolitan Kenyan urban community. The study protocol and ethics was approved by the Kenya Medical Research Institute's (KEMRI) Ethical Review Committee mandated by the Ministry of Health in Kenya to review all research proposals involving human subjects. The research assistants were male and female above 25 years but none was over the age of 50 years. They were randomly assigned to respondents without taking into consideration their own or the respondents' sex. Although, sex and/or age of interviewers has been known to affect the outcome of gender and age-related attitudinal questions [40], as well as responses to questions on sensitive issues such as sexual behaviour [41], this was not taken into

account during the survey. The characteristics of the interviewers may have biased the study findings leading to under-reporting of personal risk [42] compounded by taboo issue of sexuality in old age among African societies.

Measures

Perception of risk

The dependent variable assessing perception of risk is based on the question 'Do you think your chances of contracting HIV/AIDS are small, moderate, great or no risk at all?' Those who reported moderate and great risk of contracting the HIV virus were not significantly different in what they considered as reasons for their perceived risk and were therefore combined to create an outcome variable with three response categories: no risk at all, small, and moderate/great. 'No risk at all' was taken as the reference category. Eight individuals (8) who reported to be already infected with the HIV virus were excluded from the analysis.

Explanatory factors

Socio-demographic variables (gender, age, marital status, and education) known to determine risk perception were tested to measure there association with perceived vulnerability to HIV/AIDS among older people.

Ethnicity is used as a proxy for socio-cultural identity based on the notion that ethnic groups have different belief systems with regards to scepticism concerning occurrence of an event and the extent to which individuals have control over events.

Variables used to assess formal and informal social interactions outside of household are: belonging to a self-help social group, and involvement in voluntary community activities. Religious involvement has also been included to denote social interaction. The type of religion and level of participation in religious activities was hypothesised to have a bearing on how individuals perceive HIV/AIDS given the 'morality' tag usually associated with HIV infection.

A HIV-related variable included in the model is testing for HIV virus. The reference category is individuals who have ever been tested and they are compared with those who are willing to be tested and those not sure or unwilling to be tested. Other variables tested are duration of stay in the current slum and the place of residence (Korogocho or Viwandani).

To answer the research question on the factors associated with perceived level of risk, ordered logistic regression is used. Two multiple regression models are fitted. Given that studies have highlighted gender differences in perception of risk [43, 44], separate models are then fitted to assess gender-specific factors associated with perceived vulnerability to HIV infection.

Findings from qualitative study: Slums a risk factor environment

A number of behaviours or practices which could put older people at risk of HIV infection were revealed during the focus group discussions. It emerged that the slum context provides an environment that encourages high-risk behaviours, including unsafe sex and multiple partnerships that would potentially put older people at risk of HIV infection. Sexual activity across generations was reported to be rampant where older men marry or engage in sex with younger women. Intergeneration sexual relation has been highlighted as a major factor in the spread of HIV in sub-Saharan Africa although young women have been underscored as the group at risk in these encounters rather than older people. Condom use in inter-generation sex has also been highlighted to be very low given that young women are unable to negotiate for use whereas older people perceive younger people to be less likely to be infected with HIV or STIs [45, 46]. Longfield et al (2004) in a study in Kenya found that HIV infection came least in the potential risk outcomes among older and younger people who have sex with each other with older people worrying more about the financial implications whereas younger people were more worried about pregnancy.

Another factor mentioned in the discussion groups that could potentially encourage cross-generational transmission of the HIV virus is the unbalanced power relations between older men and younger girls which give older men control over sexual relations. Cockcroft et al (2010) and Longfield et al (2004) in their studies on intergenerational sex highlighted the fact that younger women have sex with older people mainly for material and economic benefits while the interest of older men is non-economic [45, 46]. Similar views on motivation for intergenerational sex also emerged in this study. For instance, older men use their economic advantage and social position to demand for sex from younger girls. This was mentioned mostly in discussion groups with younger people who considered such affairs or sexual advances from older men as embarrassing and a disrespectful act by people who

should be regarded as elders as the conversation among the following young female discussants illustrates:

R5: Some elderly persons are badly behaved when compared to the young. This makes the difference. …. R1: You know elderly men here have no manners. If they are used to these bad behaviours they start telling you 'I have a car and a lot of property, what do you want?' Q: You have said bad manners, what do you mean, could you please explain? R1: Sometimes he tells you to go and sleep with him, 'come I buy you alcohol…' R6: Some do work in the factories, they can tell you they can help you get a job and if they get you a job they want [to have] a sexual relationship with you. Q: And the ones in the rural areas? R6: The ones in the rural areas don't have such behaviours. R5: If they help you it is out of their hearts. They help you because they want you to have a better life (**15-24 females Viwandani).**

While discussing features or characteristics distinguishes older people from the young generation, that is, the signs of ageing based on how the community interprets the ageing process, the notion that men's sexual desires does not diminish with age came up in several discussions groups. This was highlighted in contrast to women who lose interest in sex especially after menopause. In this regard, older men in a martial union with a fellow older person were said to seek sexual partnership with younger women or to marry a younger woman because their older wives were no longer interested in sex.

Interestingly, cases of older women in sexual partnership with younger men was said to be rife, a practice which was considered shameful or unacceptable and thought to be only possible in urban areas due to the laxity in adherence to strict social norms which prohibit relationships of this nature as illustrated by the following excerpt when focus group participants were asked why older women continue to live in the city instead of 'returning' to rural areas:

R1: Some have 'toy boys' [relationship based only on sex] who is young compared to her, one who can pass as her son. R2: Some don't have husbands, they have nowhere to go. R1: The young men in the rural areas marry, they have no intentions… [of going out with older women] and would not like to be toy boys so the women don't like going because there are no toy boys in the rural areas (25-49 females Korogocho).

Alcohol consumption was reported to fuel sexual promiscuity including prostitution even among older people. The discussants articulated this by saying for instance, *'older people here like illicit brew a lot, in [these] dens they sleep with anyone*' When highlighting the prevalence of alcohol consumption and risky sexual behaviour among older people. Research has consistently demonstrated the association between alcohol use and risky sexual behaviour with far-reaching implications in areas with high HIV

prevalence rates [47]. Additionally, alcohol consumption has been highlight to be more rampant in areas where poverty is higher compared with wealthier neighbourhoods with informal drinking venues in particular, providing a fertile ground for sexual networking [48, 49]. The availability of cheap alcohol coupled with sale of sexual favours especially in exchange for alcohol was said to be rampant in the study community. A participants while making reference to interaction between alcohol and sexual exchange said '*Yes, here [prostitution among older people] it is common especially in drinking dens one is given 50 or 100 shillings ($0.63 and $1.25)'* although not entirely cheap in a population where monthly average households expenditure is approximately $50.

Whereas consumption of alcohol especially illicit liquor is not a condoned practice on the whole, consumption by women is scorned upon. The discussants decried the rampant consumption of alcohol by older women in particular noting that such a practice can only happen in an urban area. One discussant expressed this sentiment by saying *"The elderly women here can partake in drinking alcohol which is an abomination in the rural areas. So they rather stay here and not go back home as they will be subjected to a council of elders for misconduct."*

HIV/AIDS infection was reported to be prevalent in the community and even so among older people. This was mentioned in groups with young people and older people as well. Discussants frequently said for instance *"AIDS here is rampant. It has affected elderly people and the young. There are elderly women suffering from HIV/AIDS* (60+ Korogocho)". *"AIDS has also affected the elderly people. Some of them have died of the disease* (Opinion leaders)." A number of participants also cited personally knowing an older person who had AIDS or had died of AIDS: *"R9: One just died recently and he was elderly. R5: There is one I saw back home, who was living here in Nairobi, he came back* [moved back to the rural area] *sickly and soon died, his wife followed. People knew he had HIV/AIDS but they were hiding this fact* (25-49 females Korogocho)." Some older female discussants did voice a concern that they personally felt vulnerable to contracting HIV from their spouses. Interestingly, a few people from a group with older people however argued that AIDS was not a problem for older people when asked whether there were older people in the community affected by AIDS.

Given this context, quantitative data is used in the next section to address the following questions: (1) how older people perceive their vulnerability to HIV/AIDS and what reasons are given for the level of perceived risk? and, (2) what are the demographic and socio-cultural factors associated with perceived level of risk?

Results from the quantitative survey

Socio-demographic characteristics of the sample

Table 1 presents the percentage distribution of selected characteristics of the survey participants comparing men and women. The study sample is comprised largely of males (64%). This high sex ratio is typical for most cities in Africa, including Nairobi, where males outnumber females when compared to rural areas or other cities in the world. The majority of the current older people in Nairobi migrated to the city during the pre-independence period and immediately following independence when there was a strong bias towards single male labour migrants. Although the proportion of women migrants has been on the increase, causing the sex ratio to gradually fall, men still outnumber women among migrants to urban areas.

There are significant differences between the men and women across almost all characteristics presented in Table 1. The men are relatively younger than women with almost half of the women aged 60 years or older (44%) compared to only about 29% of the men. Whereas over two thirds (68%) of the population are currently married, only 30% of the women are in a marital union compared to an overwhelming majority of men (89%). Most of the women reported themselves to be widowed (42%) or divorced (19%), compared to only 5 percent and 4 percent of the men respectively. The lower mean age for men in the study compared to women, could in part explain the difference in marital status. In addition, women generally have higher life expectancy and tend to marry spouses older than themselves.[50] More than half of the older population reported primary schooling as their highest educational level (55%) and 14% had secondary education or higher. However, the men are more educated with more than half of the women (52%) having no formal schooling compared to only one in five men (19%).

<<TABLE 1 ABOUT HERE>>

The dominant ethnic group is Kikuyu, who make up almost half of the population of older people (45%) followed by the Kamba (16%) while the rest of the ethnic groups

constitute similar proportions. The ethnic distribution in these two slums does not reflect the country's ethnic composition nor is it representative of slums in Nairobi. Generally, most slums in Nairobi depict a unique spatial segregated pattern based on ethnicity which can be accounted for by chain migration where the presence of kin and relatives provide a base for new migrants, hence encouraging migrants from a specific place of origin to predominantly settle in one area.

Perceived level of risk

Almost three quarters (72%) of the older people felt they had 'no risk at all' of contracting HIV/AIDS (Table 2). Of those who felt at risk, a greater proportion sensed only a small chance (62%) while only 15% felt they had a moderate to great chance of contracting HIV/AIDS. Women were more likely to report having no risk at all of contracting HIV compared to men. Table 2 presents the reasons given for perceived level of risk compared across gender. Respondents were allowed to mention more than on one reason for their perceived level of risk.

There was a significant difference between men and women on the reasons given for perceiving 'no risk all' and 'small chance' but not among those who reported a 'moderate to great' risk. Women were more likely to report perceiving 'no risk at all' because they abstain from sex (70%) followed by having only one sexual partner (23%). Conversely, men were more likely to report perceiving 'no risk at all' because they have only one sexual partner (63%), while the second most cited reason was that the spouse has no other sexual partners (35%). Men were more likely to mention being faithful to partner (6%) compared to women (<1%) whereas women were more likely to report having no sexual urges (4%) unlike only about one percent of men. There was no significant difference between men and women in reporting modes of HIV transmission that do not involve sexual intercourse for instance avoiding blood transfusion and avoiding un-sterilised body piercing as reasons for having 'no risk at all' of contracting the HIV virus.

<<TABLE 2 ABOUT HERE>>

A similar pattern to reasons given for perceiving 'no risk at all' across gender also emerged when comparing reasons cited by men and women who perceived only a small chance of contracting HIV/AIDS. A third of the women mentioned abstaining from sex (66%) compared to only 21% of men. Men were more likely to report

having only one sexual partner (78%) as reason for perceiving a small chance of contracting HIV compared to only 35% of women.

In contrast to the distinct differences between men and women on the reasons cited for perceiving 'no risk at all' and 'small risk', there were no significant gender difference on the reasons reported for perceiving 'moderate to great' chance of contracting HIV/AIDS. The only exception was mentioning contact with someone with AIDS where a significant proportion of women (14%) compared to men (5%) mentioned this as a risk factor. Overall, older people who perceived a moderate to great chance of contracting HIV/AIDS cited having more than one sexual partner (41%), not using condoms (28%), having many sexual partners (27%) and the spouse having other sexual partners (25%) as the most commonly reported reasons respectively.

Bivariate and multiple regression results

Table 3 presents the percentage distribution of the dependent variable (perceived level of risk to HIV infection) and the independent variables. Chi-square test was performed on the bivariate analysis and the differences on perceived risk across all the independent variables were statistically significance at the 95% level. Age has an inverse relationship with perceived risk where people in the older age groups were more likely to perceive no risk at all compared to the younger age groups. Those currently married were more likely to report having at least a small chance of contracting HIV (32%) followed by those never married (20%). Among older people who are formerly married, a significant proportion of those who were widowed (13%) reported a small chance of contracting HIV compared to only 8% of those divorced or separated. Older people with some level of education were more likely to perceive a small to great chance of contracting HIV/AIDS compared to those who have never been to school. For instance, 16% of older people with secondary education or more reported a moderate to great chance of contracting HIV compared to 10% and 9% of those with primary and no education respectively. Residents of Korogocho slum were more likely to perceive no risk of HIV (77%) compared with Viwandani residents (61%).

The level of perceived risk varied across the ethnic groups where the Somali/Borana were more likely to perceive some risk (37%) followed by the Kamba ethnic group

(33%). A significantly higher proportion of the Kikuyu (78%) reported no risk at all compared to other ethnic groups. Across faith groups, one third of the Muslims reported a small or moderate risk (35%) compared to 28% of the Roman Catholics and an even lower proportion among other Christians (26%).

Being a member of a social group and participating in other community-level activities was associated with perceiving no risk of contracting HIV compared with non-participants in such group activities. For instance, only 21% of those who belong to a self-help group perceived at least a small chance of contracting HIV compared with 32% of older people who are non-members. A similar effect is observed among those who participate regularly in voluntary community activitiess. Older people who have ever been tested for HIV (71%) and those willing to be tested (79%) were more likely to report having no risk at all compared with only 68% of those unwilling to be tested.

The results of the ordered logistic regression analyses are presented in Table 4 showing the odds ratios for perceiving HIV risk for women and men separately.

Socio-demographic characteristics as predictors of risk perception

Age, slum location, and ethnicity were independently associated with reporting risk to HIV infection. Only older men 70 years and older (OR: 0.55, CI 0.32–0.93), were significantly less likely to report being at risk of contracting HIV relative to 50-54 year olds. Age was however not significantly associated with reporting risk among the women. Marital status and level of education did not independently predict perceiving HIV risk among both men and women. On the other hand, older people living in Viwandani slum were more likely to report being at risk of contracting HIV/AIDS compared to those in Korogocho slum and this was consistent in all the models. With regards to ethnicity, older men from the Luo (OR: 1.56, CI 1.06–2.28) and Somali ethnic groups (OR: 3.37, CI 1.31–8.71), were significantly more likely to perceive being at risk of contracting HIV/AIDS compared with men from the Kikuyu ethnic group.

Social interaction and networking as predictors of risk perception

Belonging to a self-help social group, participation in community activitiess, and the frequency of attending religious services were significantly associated with perceiving risk to HIV/AIDS infection though in varying degree and direction of association.

Older people (both men [OR: 0.58, CI 0.43–0.79] and women [OR: 0.49, CI 0.31–0.76), who are members of a self-help social group were less likely to report having some chance of HIV infection compared to those who are not members to such groups. On the contrary, participating regularly in voluntary community activities had an opposing effect whereby those who attend these meetings were up to two times more likely to report having some chance compared to non-attendees.

Frequency of attending religious services increased the chances of perceiving risk to HIV infection. Older people who attend religious services at least once a week were significantly less likely to perceive being at risk of contracting HIV compared to those who never attend any service. Amongst women, attending religious services even on special occasion only was significantly associated with perceiving less risk of HIV infection. Interestingly, the type of religious affiliation was not a significant predictor of perceiving vulnerability to HIV infection.

HIV/AIDS testing as a predictor of risk perception

Testing for the presence of HIV virus had an inconsistent outcome among the men compared with women. Older women who have ever been tested (OR: 1.61, CI 1.01–2.58) were significantly more likely to perceive some risk of contracting HIV compared to those unwilling to be tested whereas among the men there was no significant difference in risk perception between men who have ever been tested (OR: 1.00, CI 0.73–1.36) and those unwilling to be tested. Women who were willing to be tested did not differ from women unwilling to be tested (OR: 0.70, CI 0.44–1.10), On the contrary, older men who were willing to be tested were significantly different in their perception of risk from those unwilling to be tested (OR: 0.69, CI 0.50–0.96). Interestingly, older people who were willing to be tested (both men and women) were less likely to perceive being at risk of HIV infection compared to those unwilling to be tested although the differences among the women were not statistically significant.

Discussion

Perception of individual vulnerability to HIV infection is a major predictor of adopting preventive strategies to reduce one's own risk of contracting HIV. Some studies conducted in sub-Saharan Africa show that individuals particularly young married women do over-estimate their chances of contracting HIV while younger men have a more realistic assessment of their risk [13, 51], however under-estimation of

personal vulnerability can result in less preventive action thereby exposing oneself to the risk of infection [52]. Therefore, understanding levels of risk perception to HIV infection and the factors associated with individuals' perception of risk is fundamental for effective interventions aimed at preventing infection. This paper set out to understand how older people living in slums of Nairobi assess their personal vulnerability to HIV/AIDS infection.

A large majority of the older people in the study (72%) do not believe they are at any risk of HIV infection. Studies that have found similar proportions among the general population are mainly those conducted in regions with very low HIV prevalence rates [17, 53, 54]. In regions with medium to high HIV prevalence rates, less than or about half do not regard themselves vulnerable to HIV infection [44, 55-57]. However, most of these studies are conducted mainly with adolescents and adults of reproductive ages. Studies that have compared people of different age groups find that younger people are more likely to perceive themselves at higher risk of contracting HIV compared to relatively older people [56, 58]. A few studies mainly in North and South America that have examined perception of HIV risk among older people found a slightly lower proportion consider themselves not at any risk at all of contracting HIV [59, 60] compared with findings from this study.

A key finding that emerged from this study was that older women in the slums were less likely to perceive themselves at risk of HIV infection compared to older men. Findings from studies that have looked at gender variation in HIV risk perception have not been consistent as some have found women to be more likely to perceive being at higher risk compared to men [57, 61] whereas other studies have concluded on the contrary [56, 62, 63] with some finding no difference between males and females [44, 55]. One study did find however that among older age groups, males were more likely to perceive higher risk than females from a similar age group [56].

The reasons for perceiving no risk at all or a small risk were gendered with older women more likely to report abstaining from sex whereas men were confident that they had only one sexual partner or likewise, their partner did not have other sexual partners. On the contrary, unlike what has been observed in sub-Saharan Africa where women perceive moderate to high risk because they are worried of their partner's sexual behaviour while men worry because of their own sexual risk taking [44, 56], this study found no gender difference as to why they perceive a higher chances of

contracting HIV. For instance, there was no significant difference on the proportion of men and women who were concerned because they have multiple sexual partners or because their sexual partner has other concurrent partners.

The other objective of this paper was to understand the factors associated with HIV risk perception. Although in the bivariate analyses socio-demographic characteristics (gender, age, marital status, education and ethnicity) significantly predicted HIV risk perception, these became insignificant when other factors were accounted for in the multivariate analyses. Only older men aged 70 years and older were significantly less likely to perceive risk of HIV infection compared to younger men (50-54 years). Similarly, men from the Luo and Somali ethnic groups were more likely to perceive being at risk compared to men from the Kikuyu ethnic group. There was however no difference in perception of risk among women from different ethnic groups.

Another key finding from this study was the observation that interacting regularly with people other than household or family members through participating in self-help social groups or community activities was significantly associated with perceiving risk to HIV infection. A number of empirical studies have found social groups or social networks to have important and considerable effects on perception of HIV risk [64, 65]. Therefore it was expected that members of self-help social groups and individuals who participate regularly in community activities or meetings would perceive HIV risk in a similar way. Nonetheless, the direction of association differ as older people who are members of a self-help social group were less likely to perceive being at risk of HIV infection whereas older people who participate regularly in community activities or meetings were more likely to perceive being at risk. This might appear counterintuitive however, there are plausible explanations. One rationale could be that the two forms of social networking vary in their role as avenues for learning, information sharing, or influencing the enforcement of 'socially acceptable norms' [25, 26]. The counter explanation to this argument could be that older people who are members of a self-help social group and those who participate in involuntary community activities regularly are not randomly selected but are systematically drawn to each other through shared attitudes and preferences [64]. It should be noted however that the topics of discussion during these meetings or gatherings were not assessed in the current study although the assumption was that HIV and AIDS is a frequent topic

of formal and informal conversation particularly in regions ravaged by the epidemic as has been noted [26].

Although numerous studies have found religion to be a significant factor in influencing HIV risk perception particularly when comparing different religions for example Christianity vis-à-vis Islam, the type of religion did not independently predict HIV risk perception in the present study. Nevertheless, religiosity expressed in terms of frequency of participating in religious services was significantly associated with HIV risk perception. Older men and women who participate in religious services more than once a week were less likely to perceive being at risk of HIV infection compared to those who never attend such services thus indicating that the role of religion may differ for devotees compared to those less devoted. It can be argued that highly religious devotees in this study may relate HIV infection with labels of immorality and as a consequence of wrong doing for people who are not religious or those who have turned away from their religion as shown by a number of studies that have identified stereotypical attitudes towards those who contract the disease, thereby making religiously-devouted people to feel less at risk of HIV infection [66].

Conclusion

Despite high rates of HIV prevalence rates and a generalised epidemic being reported in the region where this study was conducted, coupled with a very high general public awareness about HIV and AIDS [67, 68], the findings from this paper points our attention on the fact that many of the older people do not consider themselves to be personally vulnerable to HIV infection. Recent epidemiological surveillance reports from sub-Saharan Africa highlight HIV prevalence rates among older people to be similar [69] or even higher [70] than the national average. Yet older people do not perceive themselves as vulnerable and they are more likely to underestimate their likelihood of contracting HIV [51, 58, 71]. In the United States where older people aged 50 years and older account for almost 15% of all new cases and 24% of persons living with HIV and AIDS [72], there has been an upsurge on research focusing on HIV and AIDS, and older people. This research from the United States has demonstrated that older people do not perceive themselves at risk of infection [58-60], they engage in high-risk sexual behaviour [73-75], and are not likely to take a HIV test unless prompted by a health physician [52, 76].

Notably, research on sexual health of older people in sub-Saharan Africa has received very little attention. This paper sought to contribute to knowledge in this field. In order to influence healthy sexual outcomes and minimise HIV infection among older people, it is imperative to understand how they perceive themselves at risk of HIV infection. Having said this, the current paper did not assess how accurately older people perceive their vulnerability to HIV infection. As a suggestion for future research, examining the relationship between self perceived risk to HIV and objective measures such as HIV testing among older people is recommended. In addition, understanding how perceived risk to HIV infection is associated with risky behaviour would provide a better understanding to older people's susceptibility to HIV infection.

Limitation

One limitation in studies investigating sexuality and sex-related topics that rely on self-reports, including this paper, is the possibility of under-reporting vulnerability due to the sensitive nature of the topics and the tendency to bias responses towards those that are socially desirable. This is particularly more sensitive among older people due to societal stance and attitude towards sex in old age [77-81].

Table 1: Characteristics of study participants compared across gender

	Women	Men	Total
5-year age groups* **			
50-54	37.0	44.2	41.6
55-59	18.8	27.0	24.0
60-64	15.5	13.7	14.4
65-69	10.0	6.2	7.6
70-74	18.6	8.9	12.4
Mean Age	*61.2*	*58.0*	*59.1*
Marital status* **			
Currently married	30.5	89.3	68.1
Divorced/separated	18.8	4.4	9.6
Widowed	42.0	4.8	18.2
Never married	8.6	1.4	4.0
Highest level of schooling* **			
Never Attended School	51.6	19.1	30.8
Primary	42.7	61.6	54.8
Secondary	5.7	19.4	14.4
Slum location* **			
Korogocho	79.6	65.4	70.5
Viwandani	20.4	34.6	29.5
Ethnicity* **			
Kikuyu/Embu/Meru	60.0	36.9	45.2
Luhya	5.4	15.8	12.0
Luo	6.6	15.0	12.0
Kamba	12.0	18.2	16.0
Somali/Borana	13.4	9.7	11.0
Other	2.6	4.5	3.8
Total	36.0	64.0	100.0
Sample size	*740*	*1313*	*2,053*

Table 2: Reasons given for perceived level of risk by gender

	Women	Men	Total
No risk at all of contracting HIV/AIDS	**79.1**	**68.4**	**72.2**
N	***585***	***898***	***1,483***
Abstain from sex ***	70.1	24.8	42.7
Use condoms ***	2.8	8.1	6.0
Have only one sex partner ***	23.2	63.5	47.7
Spouse has no other sex partners ***	9.0	34.9	24.8
Avoid blood transfusion	11.9	8.8	10.0
Avoid un-sterilised body piercing	14.8	12.5	13.4
Use own body piercing instruments **	4.5	8.9	7.2
Faithful to partner ***	0.5	5.9	3.8
Has no urge for sex ***	3.6	0.6	1.8
Too old to have sex	0.0	0.4	0.3
Small chance of contracting HIV/AIDS	**12.4**	**20.0**	**17.3**
N	***92***	***263***	***355***
Abstain from sex ***	66.3	21.3	33.0
Use condoms **	0.0	7.2	5.4
Have only one sex partner ***	34.8	78.3	67.0
Spouse has no other sex partners ***	4.3	34.6	26.8
Avoid blood transfusion	4.3	3.0	3.4
Avoid un-sterilised body piercing	13.0	6.8	8.5
Use own body piercing instruments	0.0	2.3	1.7
Faithful to partner	0.0	1.9	1.4
Has no urge for sex **	4.3	0.0	1.1
Too old to have sex	0.0	0.4	0.3
Moderate/ Great chance of contracting HIV/AIDS	**8.5**	**11.6**	**10.5**
N	**63**	**152**	**215**
Does not use condoms	20.6	30.9	27.9
Has more than one sex partner	34.9	43.4	40.9
Has many sex partners	33.3	24.3	27.0
Spouse has other sex partners	27.0	23.7	24.7
Has had a blood transfusion	17.5	18.4	18.1
Has had body piercing	20.6	19.7	20.0
Has interacted with someone with AIDS *	14.3	4.6	7.4
Lost weight recently	0.0	2.6	1.9
Has weak body resistance	6.5	3.3	4.2
Does not know	4.8	4.6	4.7

Table 3: Perceived level of risk compared across demographic, social, and HIV-related characteristics

	No risk at all	small	Moderate/ Great	N
Gender				
Women	79.1	12.4	8.5	*740*
Men	68.4	20.0	11.6	*1,313*
5-year age groups				
50-54	69.3	19.0	11.7	*854*
55-59	70.2	18.9	11.0	*493*
60-64	73.6	16.6	9.8	*295*
65-69	75.6	15.4	9.0	*156*
70+	82.4	10.6	7.1	*255*
Marital status				
Currently married	68.1	20.4	11.5	*1,399*
Divorced/separated	81.7	7.6	10.7	*197*
Widowed	81.0	12.6	6.4	*374*
Never married	79.5	9.6	10.8	*83*
Highest level of schooling				
Never Attended School	75.2	15.5	9.3	*632*
Primary	73.7	16.5	9.8	*1,124*
Secondary	60.5	24.0	15.5	*296*
Slum location				
Korogocho	77.0	11.7	11.3	*1,448*
Viwandani	60.8	30.6	8.6	*605*
Ethnicity				
Kikuyu/Embu/Meru	78.3	14.5	7.1	*928*
Luhya	68.4	15.8	15.8	*247*
Luo	69.1	16.3	14.6	*246*
Kamba	66.8	24.4	8.8	*328*
Somali/Borana	63.3	19.0	17.7	*226*
Other	70.5	23.1	6.4	*78*
Belongs to a self-help social group				
No	79.4	10.4	10.2	*722*
Yes	68.3	21.1	10.6	*1,330*
Participate in voluntary activities in the community				
No	72.0	14.3	13.6	*991*
Yes	72.4	20.1	7.5	*1,061*
Religious affiliation				
Roman Catholic	75.6	14.8	9.6	*669*
Protestant/Other Christians	71.7	18.5	9.7	*1,122*
Muslim	65.5	18.4	16.1	*261*
Frequency of attending religious services				
Never	72.8	9.2	17.9	*173*
more than once a week	75.2	16.7	8.0	*323*
Once a week	72.0	18.4	9.6	*1,184*
Once or twice a month	66.8	21.0	12.1	*214*
special occasions only	74.8	13.8	11.3	*159*
Testing for HIV virus				
Ever tested	71.1	9.1	19.8	*439*
Willing to test	79.3	13.5	7.2	*600*
Unwilling to test	68.5	23.1	8.4	*1,013*
Total	72.2	17.3	10.5	*2,053*

Table 4: Ordered logistic regression model testing socio-demographic, social networking, community interaction and testing for HIV as determinants of perception of risk for HIV infection

	Women		Men	
	Odds Ratio	**95% CI**	**Odds Ratio**	**95% CI**
Age groups				
50-54 (Ref)				
55-59	0.90	[0.54-1.50]	1.02	[0.76-1.36]
60-64	0.86	[0.47-1.55]	1.01	[0.70-1.48]
65-69	0.98	[0.49-1.97]	0.84	[0.50-1.43]
70+	0.78	[0.41-1.48]	0.55*	[0.32-0.93]
Marital status				
Currently married (Ref)				
Divorced/separated	0.83	[0.47-1.46]	0.65	[0.33-1.28]
Widowed	0.83	[0.52-1.31]	0.58	[0.29-1.15]
Never married	0.95	[0.46-1.95]	0.65	[0.21-2.05]
Highest level of schooling				
Never Attended School (Ref)				
Primary	1.23	[0.78-1.93]	0.82	[0.56-1.19]
Secondary	1.00	[0.42-2.35]	1.38	[0.89-2.14]
Slum location				
Korogocho (Ref)				
Viwandani	1.87**	[1.19-2.92]	1.43*	[1.07-1.90]
Ethnicity				
Kikuyu/Embu/Meru (Ref)				
Luhya	1.57	[0.72-3.44]	1.18	[0.82-1.71]
Luo	1.27	[0.60-2.70]	1.56*	[1.06-2.28]
Kamba	1.01	[0.56-1.84]	1.19	[0.84-1.70]
Somali/Borana	1.48	[0.40-5.46]	3.37*	[1.31-8.71]
Other	0.84	[0.23-3.07]	1.10	[0.59-2.05]
Belongs to a self-help social group	0.49**	[0.31-0.76]	0.58***	[0.43-0.79]
Participate in voluntary activities in the community	2.08**	[1.36-3.19]	1.62***	[1.27-2.08]
Type of religious affiliation				
Protestant/other Christians (Ref)				
Roman Catholic	0.94	[0.61-1.47]	0.81	[0.61-1.08]
Muslim	1.83	[0.52-6.43]	0.88	[0.35-2.22]
Frequency of attending religious services				
Never (Ref)				
more than once a week	0.33**	[0.15-0.73]	0.53*	[0.29-0.95]
Once a week	0.43*	[0.21-0.88]	0.90	[0.56-1.45]
Once or twice a month	0.43	[0.16-1.20]	1.02	[0.59-1.76]
special occasions only	0.28*	[0.09-0.83]	0.89	[0.49-1.62]
Testing for HIV virus				
Unwilling to test (Ref)				
Ever tested	1.61*	[1.01-2.58]	1.00	[0.73-1.36]
Willing to test	0.70	[0.44-1.10]	0.69*	[0.50-0.96]

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