Perception of HIV/AIDS risk among older people living in slums settlements of Nairobi City, Kenya

Abstract

Objective: The paper explores the role of experiential knowledge and affective feelings in influencing perceived HIV/AIDS risk factors among older people. *Data:* 2,771 people aged 50 years and older were interviews as part of a larger study in Korogocho and Viwandani slums of Nairobi, Kenya. *Results:* Caring for orphans (65%), those infected with HIV/AIDS (48%), HIV infection among older people (38%), and loss of support from adult children through illness or death (37%) were the four most cited HIV/AIDS risks. Women were more likely to mention caring for orphans while men were more concerned with HIV infection among older people. The relationship between employment status, reliance on children for support, adult child mortality, perceived self-risk of infection and caregiving experience on the one hand and the four HIV/AIDS risk factors controlling for other socio-demographic characteristics was examined using logistic regression. Older people living alone or in mixed households were less likely to mention caring for orphans compared to those in skip-generation households. Having secondary education, employment in the formal sector and having cared for someone with a HIV-related illness was significantly associated with reporting HIV infection as a concern. Those working in formal employment were less likely to report loss of support from adult children as a HIV/AIDS risk compared to those engaged in unreliable economic activities. *Conclusion:* Personal experiences and feelings of vulnerability towards HIV/AIDS-risk factors were associated with perceived HIV/AIDS threats. Older people recognise HIV infection among their age group as a concern dispelling the notion that older people do not perceive themselves at risk. They should therefore be targeted in prevention interventions.

Introduction

The increasing proportion of older people and the HIV/AIDS pandemic have emerged as challenging issues in the developing world with social, demographic, and economic implications. Notwithstanding the different consequences of both ageing and HIV/AIDS, these two phenomena interact when older people are directly impacted by HIV/AIDS through infection or indirectly when they assume the role of caregiving to persons who are infected and caring for orphaned children. Older people are also affected through loss of current and potential social and economic support they would have otherwise received from those infected and dying due to HIV/AIDS (Saengtienchai, C. and Knodel, J. E. 2001; VanLandingham, M., Knodel, J. E., Im-Em, W. et al 2000). This new role is bound to impact on their health, social and economic situation and might increase their vulnerability to extreme health and socio-economic outcomes(Dayton, J. and Ainsworth, M. 2004; VanLandingham et al 2000).

At macro level, older people may be affected by decreased revenue brought about by reduced productivity, savings and investments due to a declining workforce which in turn slows or halts economic growth. Consequently national programs that are directly dependant on government revenue and are meant to benefit the older population are impacted (Booysen, F. R., Bachmann, M., Van Rensburg, H. C. J. et al 2002a; Knodel, J. E., Watkins, S., and VanLandingham, M. 2002). At the community level, economies are affected by the illness and death of wealthier members who boost local economies and provide social support to poorer members of the community. The frequency of illness and death in the community can also dampen the initiative of people to engage in economic activities that would provide benefits in the long term or even in the short term thus denying the community, including older members a source of revenue (Williams, A. and Tumwekwase, G. 2001). Older people, who already have disproportionate health care needs, are forced to compete with other age groups for the already limited health care resources diverted to tackle HIV/AIDS-related health expenditure. Reduction in government revenue collection also impact on the amount of revenue spent on health care meant to benefit older people (Booysen, F. R., Bachmann, M., Van Rensburg, H. C. J. et al 2002b).

While existing literature points to the above pathways through which HIV/AIDS affect older people, no study has engaged with older people to investigate how they perceive HIV/AIDS as a threat to their generation. This paper seeks to fill this gap in knowledge by exploring what older people consider to be HIV/AIDS risks and the factors influencing these perceived risks.

Determinants of risk perception

Different approaches mostly borrowing from the field of psychology and sociology have been applied to study risk perception and the factors influencing variation in magnitude of perceived risk among populations. Perception of risk may be influenced by factors external to the individual or by factors operating at the individual level. Proponents of external factors argue that social relationships and environmental factors act to shape how an individual perceive a risk. The structures that exist within a community may impede or allow communication channels to filter to the individual, thus, influencing the level of perceived severity to a threat. Information within a community may flow through social networks where people with similar believes or attitudes share information and hence perceiving the same level of risk (Scherer, C.

W. and Cho, H. 2003). At the individual level, risk perception may be associated with demographic factors such as age and gender (Glendon, A. I., Dorn, L., Davies, D. R. et al 1997).

Slovic et al (2004; 2005; 2006) have advanced a psychometric model to explain perception of risk. The model indicate an association between affect which he defines as 'quality of goodness or badness experienced as a feeling' and risk perception (Slovic, P. and Peters, E. 2006). Negative affective feelings such as worry, fear and dread are brought to mind when a person thinks about a risk or hazard. Affective reaction to a risk is normally a quicker and faster reaction which occurs almost instantaneously guiding the mental process, thus, stirring thoughts about a risk and the resulting judgement. Rational or objective risk appraisal, where an individual makes assessment based on the probabilities of a risk through logical reasoning, requires time to consciously process the information and assess a situation before arriving at a conclusion. However, evoking feelings and emotions surrounding a risk, which is subjective, is often easier and quicker.

Feelings of fear, dread and worry heighten risk perception influencing the magnitude of perceived risk or attitude towards the risk. When negative affective feelings are accompanied by uncertainty and limited control of the consequences of the hazard or risk, the focus of attention will be channelled towards the resulting outcome more than the risk itself (Slovic & Peters 2006). Previous personal experiences are also important in predicting risk perception. Strong emotional experience expedites recall as the incident is tugged with affect. Individuals living in the same community or environment often perceive different levels of risk to the same threat. This variation could be attributed to differences in how individuals react affectively to a hazard or risk. Using Slovic's framework of risk perception, this paper investigates whether variation among older people in their perception of HIV/AIDS risks is a reflection of individual affective reaction to HIV/AIDS. It is hypothesized that older people whose affective feelings towards HIV/AIDS are evoked are more likely to report the risk factors facing older people.

METHODS

Study setting

The study was carried out in two slum communities, Viwandani and Korogocho, located in Nairobi City, Kenya. Slums and informal settlements which began growing in 1902 when the city was officially founded, is home to about 60-80% of Nairobi's population and 71% of the total urban population (Government of Kenya and UNCHS 2001; Matrix Development Consultants 1993; UNHABITAT 2005). Korogocho location covering 49.2 hectares of land is located in the eastern part of the city and falls under Kasarani administrative division. Viwandani located in Makadara division, a predominantly industrial zone, is relatively newer compared to other slums in the city. The slum is located in vacant plots behind large factories or below high-voltage power lines where no conventional construction can take place (Deng, N. and Turkstra, J. 2004; Matrix Development Consultants 1993). Nairobi, a regional and Kenya's economic, cultural and development hub, also has one of the highest HIV prevalence rates in the Country. Urban areas in Kenya have higher HIV prevalence rate (10%) compared to the rural areas (6%) with close to 40% of HIV positive people living in urban areas (Central Bureau of Statistics, Ministry of Health, and ORC Macro 2004; National AIDS, C. C. 2005). A greater diversity also exists within the City with slum residents exhibiting poorer sexual health outcomes and risky sexual behaviour compared to non-slum residents (Zulu, E. M., Dodoo, F. A., and Ezeh, C. A. 2002) and consequently higher HIV prevalence rates.

Data and field procedure

The data is drawn from a larger longitudinal study, Urbanization, Poverty and Health Dynamics in sub-Saharan Africa (UPHD) project, conducted by the African Population and Health Centre (APHRC) in Korogocho and Viwandani 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 is nested on the Nairobi Urban Health and Demographic Surveillance System (NUHDSS) that follows up approximately 60,000 usual residents of these two slum communities. 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 Committee is chaired by the Director of the Centre for Clinical Research.

The survey was conducted between November 2006 and January 2007 using interviewer-administered questionnaires. All the interviews were conducted at the respondents' home after obtaining a verbal and or written informed consent from the participants. The language used during the interview was Kiswahili which was the most ideal in a linguistically heterogeneous and cosmopolitan Kenyan urban community. The questionnaire was therefore translated from English to Kiswahili and the translation was checked for accuracy by translating back to English and field tested during the questionnaire pre-test. To ensure quality of data, research assistants with prior data collection experience were recruited and trained over a 2-week period involving lectures, mock interviews and pretests. The field procedures were also closely monitored by the principal investigators and on-site team leaders to ensure field assistants adhered to laid down procedures. Supervision and quality checks were enforced through spot-check interviews, editing of completed questionnaires, and through regular meetings between the field teams and the researchers.

Definition of concepts and statistical analysis

Dependent variable - HIV/AIDS risk: The information is drawn from a question asking the respondents to list what they consider to be HIV/AIDS concerns facing older people and only spontaneous responses were recorded. The question posed was *"what are the main concerns of older people in the community regarding the HIV/AIDS problem? Any other concern?"* The term 'concern' was purposively used to capture both HIV/AIDS direct and indirect impact on older people as opposed to the term 'risk' which has widely been used in HIV/AIDS literature to connote direct impact or infection. The question allowed for multiple responses and only the four most cited concerns are used in the analysis and coded '1' if mentioned and '0' otherwise.

Explanatory variables

Living arrangement – Three variables were used to describe the living arrangement of the older person. The household composition was computed using the age of the household members categorized into 4 groups: *'skip generation'* household consist of older people living alone with children aged under 15 years; *'mixed generation'*

households had children under 15 years, adult 15 – 49 years and older people; *'older people'* households had only older people living together; and *'single member'* households had only one older person living alone. The other variables on living arrangement were living with an adult child (18+ years) and living with a grandchild in the same household. Intergenerational co-residence facilitates flow of material and psycho-social support between generations. Older people who benefit from co-residence will be left vulnerable if any member of their household is infected with HIV/AIDS. Having young children under 15 years or grandchildren in the household provides a mental imagery of the impact of HIV/AIDS or it may indicate an actual lived experience thus influencing their perception of HIV/AIDS risks.

Socio-economic status – The current employment status and they type of livelihood activities were used to represent the socio-economic status. The type of employment has been categorized into four main categories: *own business* refers to self-employed individuals who run their own enterprises and may or may not have employed other workers to work in their enterprise; Informal and formal *employment* differs mainly in terms of the duration of employment and the mode of payments. *Informal employment* is more temporary and irregular and the mode of payment is mainly a daily or per job basis. *Formal employment* are for longer durations with more regular payments either weekly or monthly basis. The *other* category combines both those who engage in urban agriculture where they farm along road reserves and other open spaces within the city and those who forage for recyclable waste materials at nearby dumpsites. Having a regular income reduces the dependence by older people on family and kin for their material support. The education level attained was also used as a proxy for socio-economic status. Education can also facilitate acquisition of knowledge and information on HIV/AIDS and cognitive assessment of risks.

Support from adult children – Older people were asked if they received financial or any other support from their adult children. Those who mentioned receiving health care support or financial assistance regularly (monthly) were coded '1'or '0' otherwise.

Adult child mortality – A detailed birth history and survival status of children born to the older person was collected. The age at the time of death and the main cause of death that is either through illness or injury for children who were reported dead was

also collected. For the analysis, older people who had at least one child who died aged 18 years or older was coded as having experienced adult child mortality.

Self-perceived risk of HIV infection – This was measured using a question asking the older person *'Do you think your chances of contracting HIV/AIDS are small, moderate, great or no risk at all?'* Majority of the respondents reported to have a small chance while only 4% reported great chance of contracting HIV. This variable was recoded into a dichotomous variable *'no risk at all'* and *'some risk'* combining those who responded having a small, moderate and great risk given that. A person who believes to be at some risk of being infected with HIV may also perceive higher risks to various hazards.

Caregiving to person with chronic illness - The survey participants were asked if they were providing care to someone with a chronic illness during the time of the interview or if they had provided care during the three years preceding the survey. The respondents were categorised into 3 groups those who had provided no care (0), those providing care to a person with other illnesses (1) and those who have cared for someone with a HIV-related illness (2). The WHO AIDS case definition (WHO 2002) was used to identify ill persons with a HIV-related illness.

Other socio-demographic variables used in the analysis are sex, age groups (50-54; 55-50 and 60+), place of residence (Korogocho or Viwandani), ethnicity (Kikuyu, Luo, Luhya, Kamba and other) and marital status (in union and not in union).

Statistical analysis

At the bivariate level, the association between independent variables and the HIV/AIDS risk factors were assessed using the chi-square tests at 95% level of significance. Logistic regression analysis was used to estimate the effect of the explanatory variables on the probability of reporting a HIV/AIDS risk. Separate models were run for each of the four most cited HIV/AIDS risks facing older people.

RESULTS

Study participants

All persons aged 50 years and over which corresponded to a total of 2,771 men and women registered as residents in the Nairobi Urban Health and Demographic Surveillance System (NUHDSS) during the round preceding the survey were eligible

for interview. The socio-demographic characteristics of the respondents are presented in Table 1 compared across sex and place of residence. The distribution across the various characteristics shows a marked contrast between the men and women and also between the two slum communities. These differences point both to the historical rural-urban migration patterns and gender variations that typically characterise people in the older age groups. The population is unevenly distributed between the two slums with majority of the older people living in Korogocho slum (71%). The population is also predominantly male with the sex ratio more skewed in Viwandani where there are three times more men than women (304:100) compared to a sex ratio of 138 men per 100 women in Korogocho. Higher sex ratios have been documented in most cities in Africa. Although the proportion of women migrants has been on an increase forcing the sex ratio to gradually fall, men still out number women among migrants to urban areas. Majority of the current older people in Nairobi migrated to the city during pre-independence period and immediately following independence when there was a strong bias towards single male labour migrants (Byerlee, D. 1974; Gould, W. T. S. and Oucho, J. O. 1993). The median age for the overall population is 56 years, however, the age distribution contrasts between the two slums and also by sex. The men and consequently the population in Viwandani is relatively younger compared to the women and Korogocho population by 3 years. While almost half of the women population is aged 60 years or older (44%) only about 29% of the men are in this age group.

The dominant ethnic group is Kikuyu who make up almost half of the population in Korogocho (49%) while in Viwandani although the Kamba (36%) constitute the largest majority, those from the Kikuyu ethnic group also make up a substantial proportion (33%). The proximity of Nairobi to Central and Eastern provinces which are predominantly occupied by members of the Kikuyu and Kamba ethnic groups can explain the over-representation of these two ethnic groups in these two slums.

Education is important in facilitating employment opportunities in urban areas hence rural-urban migrants are usually characterised by people with some or higher formal education compared to those less likely to migrate. Overall, a large majority (71%) of the older people in the two slums have been to school. Nonetheless, a higher proportion of those resident in Viwandani (85%) compared to Korogocho (65%) have been to school. Also, the proportion in Viwandani with secondary education or above

is twice as high as those in Korogocho slum. Viwandani which has a relatively younger population also attracts people who have received formal education to fill up the employment opportunities in the neighbouring industrial and business enterprises. The differences between the two slums is also as a result of the high concentration of men in Viwandani and the fact that generally fewer older women compared to older men have received some formal education. Almost half of the women (48%) have never been to school compared to only one sixth of the men.

Although two thirds of the total older population reported to be currently married, only a third of the women were married compared to an overwhelming majority of men (90%). Most of the women reported to be either widowed (41%) or divorced (19%) compared to only 5% and 4% of the men respectively. The lower mean age for men in the study compared to women, could explain the difference in marital status. In addition, women generally have higher life expectancy and tend to marry spouses older than them. A significantly higher proportion of women (9%) compared to only one percent of men have never married. The proportion of those currently married in polygamous marriages was similar for the two slums, however, a slightly higher proportion of women (16%) compared to men (12%) reported to be in such a union.

Table 1: Percentage distribution of socio-demographic characteristics of study participants by sex and place of residence[1]

	Sex		Place of residence (slum)		
	Women	**Men**	**Korogocho**	**Viwandani**	**Total**
Place of residence					
Korogocho	80.3	64.9	-	-	70.6
Viwandani	19.7	35.1	-	-	29.4
Sex					
Women	-	-	42.0	24.8	36.9
Men	-	-	58.0	75.2	63.1
Sex ratio			*1.38*	*3.04*	*1.71*
5-year age groups					
50-54	37.5	44.2	37.6	51.5	41.7
55-59	18.7	27.2	24.1	24.1	24.1
60+	43.9	28.6	38.4	24.4	34.3
Mean	*61.1*	*58.0*	*60.0*	*57.1*	*59.1*
Median	*58.0*	*56.0*	*57.0*	*54.0*	*56.0*
Marital status					
Never married	8.7	1.3	4.5	*2.8*	4.0
Currently married	31.1	89.5	63.0	*79.9*	67.9
Divorced/separated	18.9	4.3	11.5	*5.5*	9.7
Widowed	41.3	4.9	21.0	*11.9*	18.3
Polygamous unions #					
No	83.5	87.6	87.0	86.7	86.9
Yes	16.5	12.4	13.0	13.3	13.1
Highest education level					
No education	47.9	18.4	34.6	15.4	28.9
Primary	46.1	61.7	53.7	61.9	56.1
Secondary & higher	6.0	20.0	11.7	22.7	15.0
Ethnic group					
Kamba	12.0	18.4	7.8	35.6	16.0
Kikuyu	57.7	36.2	48.7	33.2	44.1
Luhya	6.2	15.5	11.6	13.0	12.0
Luo	6.8	15.1	14.9	5.1	12.0
Other	17.3	14.9	17.0	13.0	15.8
N	*761*	*1300*	*1455*	*606*	*2061*

[1]Women and men; and Korogocho and Viwandani residents are significantly different at $p<0.001$ for all variables except those marked #

Determinants of HIV/AIDS risk perception

The four most cited HIV/AIDS concerns facing older people were; caring for children orphaned due to HIV/AIDS (65%), caring for infected persons (48%), HIV infection among older people (38%), and loss of support from adult children through illness or death (37%). Personal experiences such as receiving support from children, having lost at least one adult child and experience of caring for someone with a chronic illness are explored to find out if there is an association with the reported HIV/AIDS

risk factors facing older people. Other factors explored include sources of livelihood, individual perception of HIV infection and socio-demographic factors namely gender, age, marital status, place of residence, living arrangement, education and ethnicity. Table 2 presents the bivariate analysis of the four most cited concerns by individual-level factors.

Socio demographic factors

Several studies have highlighted gender differences in perception of risk with women being seen to perceive higher risks and to express greater concerns than men (Gustafson, P. E. 1998). However, there was no consistent pattern across gender on what is perceived as HIV/AIDS risks facing older people as this varied depending on the risk. Older women (68%) were more likely to report caring for orphans compared to men (63%) while the older men (41%) were more likely to report older people being infected compared to women (31%). An almost similar proportion of older men and women reporting caring for Person Living with HIV/AIDS (PLWHA) and loss of support for older people as HIV/AIDS concerns. The observed discrepancy between men and women depending on the risk could be due to differences in risk exposure and vulnerability. Women tend to feel more vulnerable towards caring for orphans compared to men. Grandparents, particularly grandmothers, have traditionally played a key role in rearing their grandchildren (Isiugo-Abanihe, U. C. 1985; Madhavan, S. 2004). Therefore, this social role could explain why older women are more likely to mention caring for orphans compared to older men. A significantly (χ^2=20.4, p=0.000) higher proportion of men reported older people being infected with HIV/AIDS as a concern compared to women. While sexual activity is known to decline with age, older people remain sexually active with older men reported to be more sexually active compared to women (Knodel, J. and Chayovan, N. 2001). Sexual activity among older men also tends to be more culturally tolerated with older women more likely to portray a lack of sexual interest compared to older men (van der, G. S. 2001).

The association between reported HIV/AIDS risk factors and education varied depending on the risk. Older people with secondary education or higher (46%) were significantly (χ^2=17.7, p=0.000) more likely to perceive infection among older people compared to those with primary (39%) or no education (32%). The opposite was however true for those who reported loss of support from adult children as a

HIV/AIDS concern. A slightly higher proportion of those with no education (37%) reported this as a concern compared to those with some education (36%) although the difference was not statistically significant (χ^2=0.10, p=0.964). Higher education level can be an indicator for higher socio-economic status hence older people with higher socio-economic status, feel more vulnerable to HIV infection. A positive association between education and HIV infection especially in the earlier phases of the epidemic has been observed and this has been attributed to multiple sexual partnership and or engaging with commercial sex workers due to the economic advantage of those with higher education. Conversely, older people with no education may feel more vulnerability to loss of adult support probably because of their low economic status. Their expectation for economic support from their adult children during their old age may make them vulnerable in the event of illness or death of their children.

Other notable findings were that a significantly (χ^2=6.3, p=0.007) higher proportion of those currently married (40%) were more likely to report older people being infected compared to those not currently in union (33%). Residents of Viwandani community were more likely to report the four main HIV/AIDS concerns compared to older people living in Korogocho community which could also explain the variation by ethnicity where members of the Kamba ethnic group, who form the majority of population living in Viwandani, were significantly more likely to report HIV/AIDS concerns compared to other ethnic groups. Age did not show a consistent pattern among those who reported caring for orphans and older people being infected. There was little or no difference by age among older people who reported caring for those infected and loss of support from adult children.

Economic and livelihood status

Although older people currently working were more likely to report the four major HIV/AIDS concerns facing older people, there was a variation according to the type of employment. Older people in employment type categories as 'other' were significantly more likely to report caring for orphans(χ^2=9.5, p=0.023) and loss of support (χ^2=21.8, p=0.000) as concerns facing older people compared to those engaged in formal or informal employment or those running their own enterprises. The category 'other' refers to older people engaged mainly in urban agriculture and collection of waste material for recycling an indication of very unstable and unreliable type of employment. They are, therefore, more likely to feel vulnerable and unable to

cope with the financial demands of caring for orphans and may depend more on adult children for support compared to those engaged in formal employment.

Workers in the formal sector have a steadier, reliable and relatively higher income compared to other sectors and therefore, less likely to be dependant on others including their adult children for support. Likewise, a higher proportion of older people receiving income (38%) or health care support (39%) regularly from their children where more likely to report loss of support from adult children as a concern compared to those receiving no support (36%). On the other hand however, older people in formal employment were significantly (χ^2=46.1, p=0.000) more likely to be concerned about HIV infection compared to those in informal employment. Almost twice the proportion of older people engaged in formal employment (48%) reported HIV/AIDS infection among older people as a concern compared those in employment categories as 'other' (27%). Having higher incomes can lead people to engage in HIV/AIDS risky behaviour such as having multiple partners or engaging in commercial sex.

Table 2: Percentage distribution of older people by reported HIV/AIDS concern and individual-level factors

	Caring for orphaned children	Caring for persons infected	Loss of support from adult children	Older people being infected	*N*
Gender	*			***	
Females	68.1	49.1	37.3	31.3	*758*
Males	63.0	47.9	36.2	41.3	*1,296*
5-year age groups					
50-54	65.2	48.3	36.1	38.8	*857*
55-59	62.6	48.6	36.6	39.4	*494*
60+	66.1	48.3	37.2	34.9	*704*
Marital status				***	
not married	64.3	48.8	37.6	39.6	*1,398*
currently married	66.1	47.4	34.4	33.4	*657*
Place of residence	***	***		***	
Korogocho	62.0	42.2	36.6	32.1	*1,449*
Viwandani	71.6	63.0	36.6	50.7	*606*
Highest education level				***	
no education	66.1	48.8	37.0	31.7	*572*
primary	63.5	48.3	36.4	39.0	*1,110*
Secondary & higher	67.5	49.2	36.3	45.8	*295*
Ethnic group	**			***	
Kamba	70.6	51.7	40.6	47.1	*330*
Kikuyu	66.0	49.3	35.5	34.7	*904*
Luhya	61.9	49.4	36.0	46.2	*247*
Luo	57.3	41.1	35.5	29.8	*248*
Other	63.8	47.1	36.6	35.4	*326*
Currently working			***		
no	62.9	47.5	30.9	36.3	*445*
yes	65.4	48.6	38.1	38.0	*1,610*
Type of current employment	**		***	***	
runs own business	63.1	48.1	37.6	32.5	*889*
informal employment	67.6	50.2	37.8	45.8	*527*
formal employment	61.5	46.3	28.7	48.0	*377*
Other type of work	74.4	48.8	51.2	27.3	*121*
Receives income regularly from children					
none	64.9	48.8	35.7	37.2	*1,594*
yes	65.6	44.2	38.1	37.3	*378*
received health care support from children	*			**	
none	65.8	47.5	35.6	38.2	*1,683*
yes	60.6	50.2	39.4	31.1	*289*
At least one child died at 15+ years					
none	64.1	47.4	35.9	37.8	*1,689*

one	70.1	51.0	39.0	34.3	*264*
Household composition	***		*		
single member	64.1	48.8	33.2	40.4	*676*
mixed generation	64.0	47.3	38.1	36.1	*1,089*
older people only	62.9	51.1	36.5	37.6	*178*
skip generation	81.3	51.4	42.9	35.7	*112*
Lives with grand children in household	**			***	
none	63.6	48.5	35.7	39.0	*1,653*
one	69.8	47.6	40.0	31.8	*391*
Lives with at least one child 15+ years in household			***		
none	65.3	47.8	35.0	37.8	*1,694*
one	62.9	48.7	43.7	33.6	*278*
Personal chances of contracting HIV/AIDS	**	***	**		
some risk	69.2	53.3	32.2	40.0	*568*
no risk at all	63.3	46.4	38.3	36.5	*1,480*
Provided care to chronically ill person			***		
not provided care	64.5	47.6	37.6	38.1	*1,840*
other illness	65.6	53.1	32.8	32.0	*128*
HIV-related	72.4	57.5	20.7	35.6	*87*
Total	64.9	48.4	36.6	37.6	*2,055*

P values: ***p<0·001; **p<0·01; *p<0·05

Related-risk exposure

Persons who have been affected by HIV/AIDS or events similar to outcomes of HIV/AIDS impact were more likely to report HIV concerns compared to those who have had no experience. A higher proportion of older people with at least one adult child over 14 years of age who had died reported caring for orphans (70%), caring for PLWHA (51%) and loss of support (39%) as concerns compared to 64%, 47% and 36% respectively, among those with no adult child who had died. Having an adult child who has died is likely to trigger concerns about consequences of an adult child dying such as having to look after grandchildren, taking care of grandchildren or losing material or emotional support from the child. The person may also have had these experiences and would, therefore, more likely report these events or outcomes although the death may or may not be HIV-related. Having grandchildren living in the same household may produce an equivalent effect as older people living in skip generation household were significantly (χ^2=14.0, p=0.003) more likely to report orphans as a concern compared to older people in other types of households. Similarly, those living with at least one grandchild in the household regardless of the presence of other members in the household were also significantly more likely to report orphans as a concern compared with those with none (χ^2=6.3, p=0.010).

Co-residence between older people and their adult children can be an indication of reciprocal exchanges between the two generations or it can indicate an unidirectional exchange from the young to the old or vis versa. A higher proportion of older people living in the same household with an adult child (44%) were concerned about loss of support to older people compared to those not living with an adult child (35%), this difference was also statistically significant (χ^2=7.8, p=0.005). Older people co-residing with their adult children are likely to be dependant on them for material support and would be adversely affected by loss of adult children. In a study looking at living arrangements of older people in developing world, older people with higher socio-economic indicators were less likely to live in extended families and also less likely to co-reside with adult children implying financial independence of older people in this kind of living arrangement (Bongaarts, J. and Zimmer, Z. 2002). Within an urban slum setting, co-residence may indicate inability to afford renting more space rather than preference (Lloyd-Sherlock, P. 2005). Older people who think they may be at risk of contracting HIV/AIDS were more likely to report caring for

orphans, caring for PLWHA and HIV infection among older people but less likely to report loss of support from adult children.

Results of mulitivariate analysis

Results of a logistic regression looking at the association between what was reported as HIV/AIDS concerns controlling for all the covariates are presented in Table 3. Separate models where run for each of the four risk factors namely; caring for orphaned children, caring for PLWHA, loss of support to from adult children an HIV infection among older people.

Table 3: Odds ratios for reported HIV/AIDS risk factors facing older people

	Caring for orphaned children	Caring for persons infected	Loss of support from adult children	Older people being infected
Gender				
Females	1.00	1.00	1.00	1.00
Males	0.90	0.88	0.99	1.07
5-year age groups				
50-54	1.00	1.00	1.00	1.00
55-59	0.96	0.98	1.01	1.08
60+	0.99	0.96	1.00	1.06
Place of residence				
Korogocho	1.00	1.00	1.00	1.00
Viwandani	***1.72	***3.08	1.18	***1.84
Highest education level				
no education	1.00	1.00	1.00	1.00
primary	0.87	0.79	0.92	1.22
secondary & higher	1.06	0.73	0.96	*1.41
Marital status				
not married	1.00	1.00	1.00	1.00
currently married	0.88	1.09	1.32	0.97
Ethnic group				
Kamba	1.00	1.00	1.00	1.00
kikuyu	0.99	1.32	0.78	0.87
Luhya	0.82	1.35	0.83	1.07
Luo	0.73	1.09	0.78	0.64
Other	0.83	1.18	0.72	1.03
Currently working				
No	1.00	1.00	1.00	1.00
Yes	*1.42	1.14	*1.44	0.81
Type of current employment				
Other type of work	1.00	1.00	1.00	1.00
runs own business	0.70	1.04	*0.62	1.13
informal employment	0.87	1.09	*0.60	*1.71
formal employment	0.60	0.67	**0.43	1.44
Receives income regularly from children				
None	1.00	1.00	1.00	1.00
Yes	1.05	*0.73	1.16	1.13
received health care support from children				
None	1.00	1.00	1.00	1.00
Yes	0.80	**1.46	1.05	0.90
At least one child died at 15+ years				
None	1.00	1.00	1.00	1.00
One	1.22	1.14	1.09	1.00
Household composition				
skip generation	1.00	1.00	1.00	1.00
Mixed generation	***0.23	0.87	0.79	1.11

older people only	**0.26	0.99	0.70	0.86
Single member	**0.30	0.81	0.60	0.78
Lives with at least one child 15+ years in household				
None	1.00	1.00	1.00	1.00
One	1.34	0.95	0.95	0.72
Lives with grand children in household				
None	1.00	1.00	1.00	1.00
One	0.96	0.95	1.20	0.87
Personal chances of contracting HIV/AIDS				
some risk	1.00	1.00	1.00	1.00
no risk at all	*0.80	0.81	**1.36	0.95
Provided care to chronically ill person				
not provided care	1.00	1.00	1.00	1.00
other illness	1.59	1.46	0.55	1.44
HIV-related	1.15	1.03	1.28	*1.71

P values: ***p<0·001; **p<0·01; *p<0·05

Place of residence remained significant in reporting all the risk factors except loss of support. Additionally, the type of household composition was significantly associated with reporting orphans as a concern. Older people in mixed generation households or those living alone or with other older people had significantly lower odds of reporting caring for orphans. The type of employment and perception of individual risk of contracting HIV/AIDS were significantly associated with loss of support. Older people in formal employment had the lowest odds of reporting loss of support compared to those in employment coded as 'other'. Perceiving no risk to HIV/AIDS increases the odds of reporting loss of support as a concern. The level of education, ethnicity, type of employment and providing care to someone with a chronic illness were only marginally significant in influencing the odds of reporting infection among older people as a concern when other variables are controlled for. None of the demographic covariates namely gender, age and marital status were significant at the multivariate level.

Discussion and conclusion

Older people in the slums perceive HIV/AIDS threats similar to what has widely been reported in HIV impact literature namely caring for children orphaned by HIV/AIDS, caring for PLWHA and loss of support from adult children. The recognition of HIV/AIDS infection by older people themselves as a threat facing their age group is of great interest. Infection among older persons various from country to country for instance in Kenya, 5% of those infected with HIV/AIDS are aged 50 years and older 5% while 10% of the cases reported to Center for Disease Control and Prevention in the United States are in this age group (National AIDS/STD Control Program 2005)Chiao, Ries, and Sande, 1999). In spite of the evidence above to show that older people are also infected with HIV/AIDS, they have received less attention in research. A number of factors account for the increase in the number of older people infected with HIV/AIDS. Sexual activity with younger people poses a risk of cross-generation infection. The assumption that older people are not sexually active or engage in risky sexual behaviour implies they are seldom the target for prevention and care information and education campaigns. HIV/AIDS care and prevention messages are also packaged for younger audience thus presenting a communication barrier worsened by high illiteracy rates among older people (Chima, R., Chima, I., and Azie, U. 2004; Ingstad, B., Bruuns, F. J., and Tlou, S. 1997; Williams & Tumwekwase

2001). Other factors such as late or missed diagnosis can also explain the increasing number of older people who are infected (Manfredi, 2004; Uphold et al, 2004). The proportion of older people who are HIV positive is set to increase due to survival chances of patients who are on treatment and also due to better care and understanding of the disease (Manfredi, 2002). Another mode of HIV/AIDS transmission among older people is through occupational risk for instance traditional healers, traditional midwifery, and providing care to those infected with HIV. Older people should therefore, be targeted in prevention interventions and the notion that older people are not a population at risk of HIV should be dispelled.

Emotions and affect play an important role in amplifying perception of HIV/AIDS risk among the older people in the study. Personal experiences and feelings of vulnerability towards HIV/AIDS-risk factors are strongly associated with what older people perceive as HIV/AIDS threats facing them. In the absence of formal social security support in old age, older people largely rely on their adult children and family for their material support. A threat to this form of support for example from HIV/AIDS illness and death of adult children may result in uncertainty and fear about the future. Having a reliable source of income can mitigate the absence or declining support from adult children. This can therefore explain why older people engaged in formal employment were less likely to report loss of support from adult children as a HIV/AIDS risk compared to those engaged in unreliable economic activities. Older people with unreliable sources of income would feel more vulnerable towards HIV compared to those with reliable sources of income.

Feelings of vulnerability to providing care to PLWHA and HIV/AIDS infection was evident among older people receiving health care support from their adult children and those working in formal employment respectively. Caring for a PLWHA exerts both financial and physical demands on the person providing the care. Older people receiving health care support themselves may feel overwhelmed if faced with the task of providing care to someone else and would therefore dread such an activity.

References

Bongaarts, J. & Zimmer, Z. 2002, "Living Arrangements of Older Adults in the Developing World: An Analysis of Demographic and Health Survey Household Surveys", *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, vol. 57, no. 3, p. S145-S157.

Booysen, F. R., Bachmann, M., Van Rensburg, H. C. J., Engelbrecht, M., Steyn, F., & Meyer, K. 2002b, *The Socio-Economic Impact of HIV/AIDS on Households in South Africa: Pilot Study in Welkom and Qwaqwa, Free State Province*, University of the Free State, Centre for Health Systems Research & Development.

Booysen, F. R., Bachmann, M., Van Rensburg, H. C. J., Engelbrecht, M., Steyn, F., & Meyer, K. 2002a, *The Socio-Economic Impact of HIV/AIDS on Households in South Africa: Pilot Study in Welkom and Qwaqwa, Free State Province*, University of the Free State, Centre for Health Systems Research & Development.

Byerlee, D. 1974, "Rural-Urban Migration in Africa: Theory, Policy and Research Implications", *International Migration Review*, vol. 8, no. 4, pp. 543-566.

Central Bureau of Statistics, Ministry of Health, & ORC Macro 2004, *Kenya Demographic and Health Survey 2003*, CBS, MOH, and ORC Macro, Calverton, Maryland.

Chima, R., Chima, I., & Azie, U. 2004, "Ageing and HIV/AIDS: Impact, Responses and Weak links", in *African Conference on Ageing*.

Dayton, J. & Ainsworth, M. 2004, "The elderly and AIDS: Coping with the impact of adult death in Tanzania", *Social Science & Medicine*, vol. 59, no. 10, pp. 2161-2172.

Deng, N. & Turkstra, J. 2004, *Urban poverty and slums, Intra-city differential study of Nairobi*, Global urban observatory, UNHABITAT, Nairobi.

Glendon, A. I., Dorn, L., Davies, D. R., Matthews, G., & Taylor, R. G. 1997, "Age and Gender Differences in Perceived Accident Likelihood and Driver Competences", *Insurance: Mathematics and Economics*, vol. 20, pp. 273-274.

Gould, W. T. S. & Oucho, J. O. 1993, "Internal migration, urbanisation and population distribution," in *Demographic Change in Sub-Saharan Africa*, National Academy Press, Washington D.C., pp. 256-296.

Government of Kenya & UNCHS 2001, *Nairobi Situation Analysis*, UNCHS, Nairobi.

Gustafson, P. E. 1998, "Gender Differences in Risk Perception: Theoretical and Methodological Perspectives", *Risk Analysis*, vol. 18, pp. 805-811.

Ingstad, B., Bruuns, F. J., & Tlou, S. 1997, "AIDS and the elderly Tswana: The concept of pollution and consequences for AIDS prevention", *Journal of Cross-Cultural Gerontology*, vol. 12, no. 4, pp. 357-372.

Isiugo-Abanihe, U. C. 1985, "Child Fosterage in West Africa
75", *Population and Development Review*, vol. 11, no. 1, pp. 53-73.

Knodel, J. & Chayovan, N. 2001, "Sexual activity among older Thais:The influence of age, gender and health", *Journal of Cross-Cultural Gerontology*, vol. 16, pp. 173-200.

Knodel, J. E., Watkins, S., & VanLandingham, M. 2002, *AIDS and Older Persons: An International Perspective*, Population Studies Center, University of Michigan, USA, 02-495.

Lloyd-Sherlock, P. 2005, *living arrangements of older persons and poverty*, Department of Economic and Social Affairs Population Division, http://www.un.org/esa/population/publications/bulletin42_43/lloydsherlock.pdf.

Madhavan, S. 2004, "Fosterage patterns in the age of AIDS: continuity and change", *Social Science and Medicine*, vol. 58, pp. 1443-1454.

Matrix Development Consultants 1993, *Nairobi's informal settlements: An inventory*.

National AIDS, C. C. 2005, *Kenya HIV/AIDS data booklet*, Government of Kenya.

National AIDS/STD Control Program 2005, *AIDS in Kenya: Trends, interventions and impact*, Republic of Kenya.

Saengtienchai, C. & Knodel, J. E. 2001, *Parents providing care to adult sons and daughters with HIV/AIDS in Thailand*, UNAIDS, Geneva, Switzerland.

Scherer, C. W. & Cho, H. 2003, "A Social Network Contagion Theory of Risk Perception", *Risk Analysis*, vol. 23, no. 2, pp. 261-267.

Slovic, P. & Peters, E. 2006, "Risk Perception and Affect", *Current Directions in Psychological Science*, vol. 15, no. 6, pp. 322-325.

UNHABITAT 2005, *Kenya urban sector profile:* UNHABITAT, Nairobi.

van der, G. S. 2001, ""No strength": sex and old age in a rural town in Ghana", *Social Science and Medicine*, vol. 53, pp. 1383-1396.

VanLandingham, M., Knodel, J. E., Im-Em, W., & Saengtienchai, C. 2000, "The Impacts of HIV/AIDS on Older Populations in Developing Countries: Some Observations Based on the Thai Case", *JOURNAL OF FAMILY ISSUES*, vol. 21, no. 6, pp. 777-805.

WHO 2002, *WHO Report on Global Surveillance of Epidemic-prone Infectious Diseases - Human Immunodeficiency Virus and Acquired Immune Deficiency Syndrome (HIV/AIDS)*.

Williams, A. & Tumwekwase, G. 2001, "Multiple impacts of the HIV/AIDS epidemic on the aged in rural Uganda", *Journal of Cross-Cultural Gerontology*, vol. 16, no. 3, pp. 221-236.

Zulu, E. M., Dodoo, F. A., & Ezeh, C. A. 2002, "Sexual risk-taking in the slums of Nairobi, Kenya, 1993-98", *Population Studies*, vol. 56, no. 3, pp. 311-323.