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Family Kinship Patterns and Female Sex Work in the Informal Urban Settlement of Kibera, Nairobi, Kenya

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Abstract A basic ecological and epidemiological question is why some women enter into commercial sex work while other women in the same socio-economic environment never do. To address this question respondent driven sampling principles were adopted to recruit and collect data for 161 female sex workers and 159 same aged women who never engaged in commercial sex in Kibera, a large informal settlement in Nairobi, Kenya. Univariate analysis indicated that basic kinship measures, including number of family members seen during adolescence and at present, not having a male guardian while growing up, and earlier times of ending relationships with both male and female guardians were associated with commercial sex work in Kibera. Multivariate analysis via logistic regression modeling showed that not having a male guardian during childhood, low education attainment and a small number of family members seen at adolescence were all significant predictors of entering sex work. By far the most important predictor of entering sex work was not having any male guardian, e.g., father, uncle, older brother, etc. during childhood. Results are interpreted in light of the historic pattern of sub-Saharan African child fostering and their relevance for young women in Kibera today.

Keywords Urban ecology · Female sex work · HIV/AIDS · Nairobi · Kenya

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Introduction

Epidemiologists, medical personnel and public health officials have long recognized the importance of female sex workers (FSWs) in the sub-Saharan African AIDS pandemic (D'Costa *et al.* 1985; Ngugi *et al.* 1988; Moses *et al.* 1991) where they can serve as core groups, i.e., sub-populations whose high rates of partner change sustain sexual infections at epidemic levels. Today female commercial sex work remains an important source of HIV infection within sub-Saharan Africa's generalized AIDS epidemic because of FSWs' high HIV prevalence rates (Steen and Dallabetta 2003; Cote *et al.* 2004; Gouws *et al.* 2006; Talbott 2007; Morris *et al.* 2009). Yet, despite extensive epidemiological research on the biological parameters of HIV transmission between African FSWs and their commercial clients, there remain important knowledge gaps in the basic social epidemiology, defined as the study of the distributions of health outcomes and their social determinants of African commercial sex work (Berkman and Kawachi 2000; Poundstone *et al.* 2004). For example, while commercial sex work is a high risk occupation both in terms of STI/HIV infection and violence (Rekart 2005), few studies consider why or how African women become FSWs, even though "effective prevention programs cannot be established until there is a better understanding of *why* women enter into commercial sex exchanges" (Kalipeni *et al.* 2004:66).

At face value the question of why women enter sex work appears overly simplistic, with economic need combined with a lack of opportunities the apparently overwhelming answer. However, in a study of rural Ugandan sex workers, Gysels *et al.* (2002) noted that not all disadvantaged women turn to sex work, while an analysis of Thai child labor (Taylor 2005) found that wealth and education were *positively* associated with high risk behavior, including commercial sex.

Recent research identified particularistic determinants of female sex work involvement, reflecting vastly different urban social ecologies. In some urban regions of North America on-street female sex work is often associated with and/or initiated by problematic substance use (Spittal *et al.* 2003). Weber *et al.* (2004) used survival analysis to delineate a constellation of factors, including having a female sex partner, polydrug use, and injection drug use as antecedents to female commercial sex in Montreal. In comparison, in urban sub-Saharan Africa where problematic substance use is only recently associated with commercial sex (Perry *et al.* 2009), Campbell's (2000, 2003) qualitative study of South African FSWs identified four factors associated with entering into commercial sex transactions: 1) death of one or both parents, 2) leaving school after a pregnancy, 3) leaving an abusive man and, 4) running away from the hardships of home.

All the South African factors traditionally were addressed by sub-Saharan Africa's extended kinship systems (Caldwell and Caldwell 1987; Lesthaeghe 1989). Death of one or both parents, for example, was commonly resolved through the widespread system of child fosterage operating from early childhood through adolescence in which both orphaned and non-orphaned children circulated among different family households (Bledsoe 1994; Serra 2009). To further investigate the importance of family and kinship on entering sex work in sub-Saharan Africa this paper compares survey data gathered from FSWs and their female neighbors engaged in other occupations in Kibera, a large informal settlement in Nairobi, Kenya. Specifically, it addresses the question of why some women with similar socio-economic backgrounds enter sex work and others never engage in commercial sex. In doing so, we hypothesize that lack of access to kinship support systems including child fosterage are important determinants of entry into sex work in this urban environment.

The Study Site

Kibera is the largest informal settlement in East Africa, with an estimated population of 800,000 people (UN HABITAT 2003) living within a one-square mile area. It epitomizes the continuing enormous rural–urban migration in sub-Saharan Africa which resulted in the majority of urban Africans now living in informal settlements, also known as slums. Today in sub-Saharan Africa over 70 % of urban dwellers live in such settlements; in Kenya the absolute number is over 2 million (UN HABITAT 2003). These settlements are characterized by poor sanitation, lack of potable water, crowding, and weak health care infrastructure. The results of these conditions are high levels of malnutrition and a heavy disease load (Bodquier *et al.* 2011; Kimani-Murage *et al.* 2011).

Kibera lies in the south west of Nairobi City, just 7 km from the city center. The area was uninhabited until the 1920s, when it was awarded to Sudanese Nubian soldiers who fought in World War I (Bendikson 2007). The name originally meant "swamp" in the Nubian language, referring to the wet marshlands in the locale. The British Colonial government never gave residents property titles; consequently the area was omitted from Post-Independence urban planning and received few public services. Today Kibera lacks roads, and most houses are made from mud and thatched with iron sheets. Clean water is scarce and expensive. Residents use communal pit latrines because Kibera also lacks public sewage disposal.

Researchers suggest that Nairobi informal settlement residents have been more highly affected by HIV/AIDS than any other sub-Saharan African population (Kyobutungi *et al.* 2008). The HIV/AIDS prevalence rate in Kibera is estimated at 12 %, more than twice the current national Kenya rate of 5.1 % (Unge *et al.* 2009). As in all Nairobi slums, high levels of poverty, alcohol and substance use combine with early age at sexual initiation to exacerbate HIV transmission and pose serious challenges for HIV/AIDS treatment (Zulu *et al.* 2002, 2004; Mugisha *et al.* 2003; Unge *et al.* 2010). At the same time Kibera provides affordable, if crude, housing for many of Nairobi's poor who otherwise would not have any. In addition, Kibera is a thriving, self-contained local economy and provides a large portion of labor for Nairobi's formal and informal urban economy.

Materials and Methods

A Kenya Free of AIDS: Harnessing interdisciplinary science for HIV prevention (KEFA) is a United States' National Institutes of Health-funded Center Grant (R24) linking the University of Nairobi, Kenya, the University of Washington, USA, and the University of Victoria, Canada. Along with infrastructure and training components, KEFA features four field-based pilot projects. Project 4 is entitled, *Exploration of Kenyan Female Commercial Sex Workers and Their Male Partners - Life Course and Harm Reduction Approaches*. In 2009 this project adopted respondent driven sampling techniques (RDS) (Heckathorn 1997) to collect data on 320 Kibera women of reproductive age. Adapted from snowball sampling, RDS uses initial "seeds" who recruit a fixed number of respondents sharing specified characteristics, in this case whether a women ever engaged in sex work or not. RDS has been successful in recruiting female sex workers from urban centers in low-income countries (Johnston *et al.* 2006; Yeka *et al.* 2006). The research design followed that developed for Canadian FSWs studies (Jansson *et al.* 2010; Benoit *et al.* 2011) by including a comparative group of women who never engaged in sex work drawn from the same socio-economic environment. The comparative group consisted of Kibera women working in other occupations,

including hairdressers, food sellers, hotel workers, and tailors. Such comparison groups are often missing in ecological (Voeten *et al.* 2007; Morris *et al.* 2009) and intervention (Ngugi *et al.* 1996, 1999, 2007) studies of African FSWs. Recruitment of FSWs is complicated in sub-Saharan Africa for two reasons. First, much sex outside commercial sex entails sex-for-money exchange which represents prescribed social norms in the form of gifts rather than identification as commercial sex (Wojcicki 2002; Luke 2006; Robinson and Yeh 2011). Second, sex work is often temporally fluid, as "[w]omen sometimes mix sex work with other economic activities and move in and out of it over time"(Ngugi *et al.* 1999:207). Because of these factors, we asked our seeds to determine if their recruits currently were sex workers, or had ever practiced sex work. To provide checks on sex work involvement the study questionnaire contained multiple questions concerning work history by year from first employment to present occupation, and asked for all past and present occupation titles and job descriptions. Seed selection for both FSWs and other Kibera working women was aided by one author's extensive research history with Kibera FSWs (Ngugi *et al.* 1988, 1999, 2007). Seeds for both FSWs and women not engaged in commercial sex work were contacted through local health centers and select women's organizations.

Kibera is divided into ten villages, or communities: Lindi, Soweto (East and West), Makina, Kianda, Mashimoni, Gatuikira, Kisumu Ndogo, Laini Saba and Siranga. Each has its own ethnic identity. For example Kisumu Ndogo, means "little Kisumu", reflecting the predominantly Luo population, whose homelands are in Western Kenya where the major city is Kisumu. Seeds were recruited from each community and from four age classes: 1) 18–24, 2) 25–34, 3) 35–44 and, 4) 45 and above. Each seed was asked to recruit comparably aged women from their own community. Recruitment of comparably aged women was to avoid potential confounding factors representing temporal change, while recruiting from one's own community strengthened knowledge of recruits' occupational history and made sampling as representative as possible in the absence of formal sampling frames. Following selection and screening each seed recruited three women from her own age class, occupation history and status (current sex worker versus never sex worker) living in her community, yielding a sample of 160 FSWs and 160 Kibera women working in other occupations (4 seeds + 12 recruits × 10 communities=160). There was only one misclassification, represented by a women reporting past sex work even though nominated by her peers as belonging to Kibera women working in other occupations.

Seeds and their recruits who met the above criteria were interviewed via a pretested questionnaire translated into Kiswahili and approved by the ethics boards of the University of Nairobi, Kenya, the University of Washington, United States and the University of Victoria, Canada. The questionnaire contained both open-ended and closed questions dealing with: 1) childhood experiences and family history, 2) educational history, 3) current living conditions, 4) occupational history and present employment, 5) physical and mental health, 6) sexual health and, 7) history of legal and illegal substance use. Respondents were given an honorarium of 500 Kenyan shillings after completing the questionnaire. Seeds were compensated an additional 200 Kenyan shillings for each recruit. All survey data were coded at the University of Nairobi and subsequently analyzed by the Statistical Analysis System (SAS®) Version 9.2 at the University of Victoria.

Results

Table 1 presents descriptive statistics for both samples. The two samples did not differ significantly with respect to age (t=1.26, p=0.210), accomplishing our goal in specifying age-specific seeds to avoid potential temporal confounding. Samples were almost identical with respect to children ever born or adopted (t=0.38, p=0.704), but differed significantly in regards to Nairobi residence, with FSWs averaging nearly six more years in Nairobi (t=5.52, p<0.001). The FSWs sample also featured far lower educational levels achieved (X^2=19.1, p=0.0008), and had significantly different marital patterns (X^2=107.6, p<0.0001), with only one FSW currently married.

Turning to measures of familial support, Table 2 lists specific questions asked about past and present kinship contact and the responses to these questions, again separated by sample. The first question asked how many family members, including aunts, uncles and siblings, did one see on a weekly basis at age 15, while the second asked this same question for the present. The FSWs sample featured lower numbers of family members reported for each question. These differences were not statistically different for family members seen at age 15 (t=1.74, p=0.082), but were for number of family members regularly seen at present (t=2.44, p=0.015). The FSWs sample also recorded significantly lower values for the number of male (t=3.62, p=0.0003), but not female (t=−0.49, p=0.624) guardians known during childhood. Finally, with respect to age at last contact with guardians with whom the respondent spent the longest time, the FSWs sample featured significantly lower values for both male (t=3.67, p=0.0003) and female (t=2.67, p=0.009) guardians compared to women from other occupations.

Analyses shown in Tables 1 and 2 indicate that the FSWs sample features historic and current weaker familial social support systems. Particularly distinctive is the different underlying distribution of male guardians, who could be fathers,

Table 1 Descriptive statistics, Kibera FSWs and women in other economic occupations (M = mean, S.D. = Standard Deviation)

Question	Female sex worker $n=161$	Kibera women in other occupations $n=159$
When were you born? (AGE)	$M=30.39$	$M=29.32$
	S.D.=7.93	S.D.=7.20
How many years have you lived in Nairobi?	$M=16.93$	$M=11.16$
	S.D.=9.30	S.D.=9.09
What was the highest education level that you attained?	None 100	NONE 48
	Primary 19	Primary 50
	Secondary 37	Secondary 55
	Post-secondary 3	Post-secondary 6
What is your current marital status?	Never married 116	Never married 45
	Married 1	Married 78
	Divorced 38	Divorced 29
	Widowed 6	Widowed 7
How many biological/adopted children have you ever raised?	$M=3.53$	$M=3.43$
	S.D.=3.13	S.D.=3.05

step-fathers, uncles or any other male who fulfills this socio-economic role, for the two samples. FSWs reported that 40 women, or 25 % of this sample, never had any contact with a male guardian during their childhood. In contrast, among the Kibera women working in other occupations, only 10 women did not have male guardians during childhood (Fig. 1).

To assess the relative importance of familial variables in comparison to an individual measure represented by education as predictors of entering sex work a logistic regression analysis (Allison 1999) was completed. The categorical dependent variable was membership in the FSWs sample versus that of the other Kibera working women. Independent variables included the following. First, the presence of male guardians; dichotomized as none (0) versus one and more (1). Second, the number of family members seen at age 15 was converted into a dichotomous variable by dividing at the total sample's median number of family members seen at this age. Thus respondents reporting less than nine family members seen at age 15 were coded as 0, while those with nine or more were coded as 1. Educational attainment was dichotomized to represent women who had primary school education or less (0) versus those with higher level schooling (1). Two other statistically significant variables from Table 2, time of last contact with male and female guardians, were omitted because of the large number of women reporting no guardians during childhood. Similarly, from Table 1 the statistically significant variable for marital status was not included, since it pertains to current adult, not adolescent status.

Table 2 Measures of family contact, Kibera FSWs and other Kibera working women. (M = mean, S.D. = Standard Deviation)

Question	Female sex worker $n=161$	Kibera women in other occupations $n=159$
How many family members, including aunts, uncles and siblings did you see on a weekly basis when you were 15 years of age?	$M=8.85$	$M=10.15$
	S.D.=8.21	S.D.=6.14
How many family members, including aunts, uncles and siblings, do you see on a weekly basis now?	$M=2.66$	$M=3.86$
	S.D.=3.06	S.D.=4.77
How many male guardians (father, step-father, or other) have you ever lived with?	$M=0.86$	$M=1.11$
	S.D.=0.69	S.D.=0. 54
How many female guardians (father, step-father, or other) have you ever lived with?	$M=1.36$	$M=1.40$
	S.D.=0.62	S.D.=0.63
Age at last contact with male guardian with whom you lived the longest?	$M=14.60$	$M=17.01$
	S.D.=5.76	S.D.=5.01
Age at last contact with female guardian with whom you lived the longest?	$M=16.78$	$M=18.06$
	S.D.=4.37	S.D.=4.31

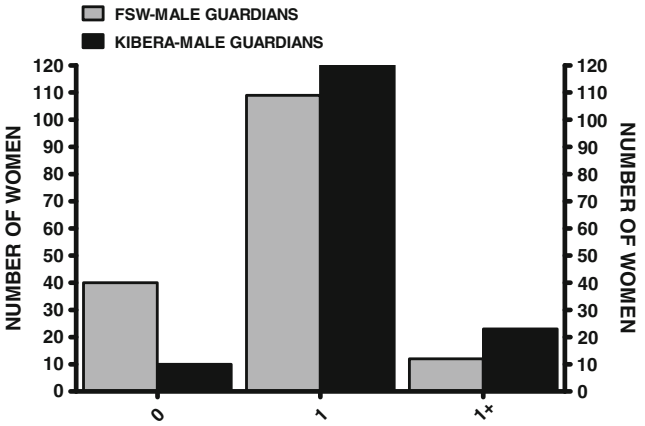

Fig. 1 Distribution of male guardians, FSWs sample compared to Kibera working women

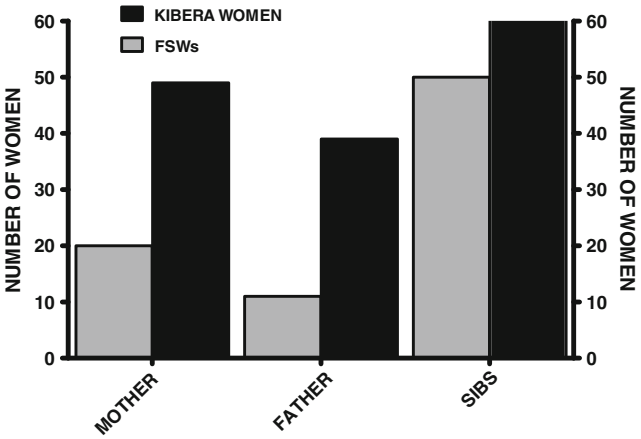

Fig. 2 "Yes" responses to the question, "*Everyone at one time or another needs economic help. In these times who do you think you could go to for money?*

Results of a main effects model, i.e., with no interaction between variables, are shown in Table 3, modeling the likelihood of membership in the FSWs sample for women not having a male guardian, having a smaller family seen at age 15, and not having an education beyond primary level. Results show that all three variables are positively signed and represent statistically significant predictors of FSWs membership. In this sample, having less than a secondary school education, having a small family network and not having a male guardian while growing up, all significantly increase the likelihood of entering into commercial sex. Lack of a male guardian is by far the most important variable; a woman not having a male guardian as a child is more than four times more likely to enter commercial sex work, relative to those women who had at least one male guardian.

Both univariate and multivariate analyses suggest that less contact with immediate family members both in the past and present are proxy measures for weak socio-economic support systems. To test this suggestion, Fig. 2 documents one important ramification of smaller family size, the potential to borrow money in times of crises. Data included in this figure are responses to the study instrument's question, "*Everyone at one time or another needs economic help. In these times who do you think you could go to for money?*" which was accompanied by reference to specific persons. Figure 2 presents the resulting "Yes" responses for three family members, mothers, fathers, and siblings, again comparing the other Kibera working women and FSWs samples. For all kinship cases, Kibera women involved in non-sex work occupations have significantly higher levels of potential assistance from family members (mothers $X^2=16.01$, $p<0.0001$; fathers $X^2=19.01$, $p<0.0001$; siblings $X^2=7.46$, $p=0.006$).

Summary and Discussion

Theoretical frameworks posit three major components for the analysis of urban health: 1) the physical environment, 2) the social environment and, 3) social services (Montgomery and Ezeh 2005; Galea *et al.* 2006). The present analysis stressed the social environment while controlling for the physical environment by sampling throughout the same locale, the large informal settlement of Kibera. Univariate and multivariate analyses supported the hypothesis that familial kinship patterns are important determinants of involvement in commercial sex for Kibera women. For univariate analysis this was exemplified by the FSWs sample recording fewer immediate family members regularly seen at age 15 and at present, significantly earlier times of last contact with male and female guardians, and greater likelihood of not having a male guardian during childhood. Multivariate analysis revealed that not having had a male guardian during childhood, whether a father, step-father, uncle or any other male fulfilling this role, was a far more important determinant of initiating sex work than total family seen at age

Table 3 Logistic regression results, dependent variable membership in Kibera FSW sample

Parameter	DF	Coefficient (standard error)	Wald chi- square	Probability	Adjusted odds ratios (95 % CI)
Intercept	1	0.3702 (0.2025)	3.34	0.0675	
Male Guardian (0)	1	0.7068 (0.1914)	13.64	0.0002	4.110 (1.941–8.704)
Education (0)	1	0.2767 (0.1290)	4.60	0.0319	1.739 (1.049–2.884)
Family seen at Age 15 (0)	1	0.2540 (0.1203)	4.45	0.0348	1.662 (1.037–2.664)

15 or achieving more education, even though all these variables were significantly associated with sex work.

We interpret the association between small numbers of family members regularly seen at age 15 and at present as also reflecting historic and contemporary sub-Saharan African rural–urban migration patterns in which rural and urban family segments are linked and maintained by kinship-based network support systems. Saunders (2010) documented this pattern on a global basis, calling the overall process "urbanization of the village," characterized by specific rural village origins of urban migrants living within localized informal settlements areas. In sub-Saharan Africa such rural–urban familial linkages historically were achieved via the cultural practice of child fostering. Serra (2009) noted that fostering can fulfill different extended family functions related to labor, formal education, reproduction and intergenerational transfers of family goods and responsibility. One common pattern is parents fostering "out" their children to urban areas to further childhood education, while fostering "in" children to rural areas to provide household labor (Panter-Brick 2000).

Yet no matter which functions underlie fostering, or the direction of fostering, e.g., "in" or "out," one expected outcome is to have multiple male and female guardians while growing up. This pattern holds for female guardians in both samples, but male guardians are notably absent from the FSWs sample. As noted earlier, Campbell's (2000, 2003) study of South African FSWs found that loss of one or more parent was a major determinant of entering commercial sex work. While our data do not allow us to ascertain if women were orphaned, for both samples a respondent reporting no male guardian indicates that no one fostered her, regardless of whether her biological parents died or survived. In both the Campbell study and this one, women lacking male guardian economic and social support more frequently entered commercial sex, highlighting the role of basic family support systems in general and in particular historical child fosterage practices in sub-Saharan Africa.

This analysis has limitations. While respondent driven sampling is superior to venue-based sampling strategies, neither approach can produce a random sample of "hidden populations" such as FSWs. In addition, while we asked many retrospective questions, our sample is cross-sectional and not prospective, as was that of Weber *et al.* (2004). Furthermore, our resulting samples included either women who entered and are currently in sex work, or those who never engaged in commercial sex. What is missing is information on women who entered sex work and then exited. As a result we recognize that our findings may not be applicable to other sub-Saharan African settings, particularly rural ones. Finally, our sample is limited to FSWs only. More research is needed on how it compared with male and transgendered sex workers.

At the same time these results point to the need to conduct more research into the antecedents of sex work for young African women in different social and physical environments, both urban and rural. This suggestion has potential applicability for FSW harm reduction interventions in sub-Saharan Africa, which may not be effective if built on familial social networks. Rather, interventions may have more impact if aligned with local organizations such as FSWs peer groups (Ngugi *et al.* 1996, 1999). Forming new and/or strengthening established local peer organizations devoted to reducing the inherent harms of sex work could increase FSWs health literacy levels and foster a heightened sense of community trust and belonging.

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