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Dimensions of poverty and inconsistent condom use among youth in urban Kenya

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To date, research on the link between poverty and unsafe sexual behaviors has utilized limited measures of socioeconomic status and has overlooked key dimensions of poverty at the individual level. This study explored how various dimensions of socioeconomic status are associated with inconsistent condom use and how these associations vary by gender. We analyzed unique life history survey data from 261 young men and women in Kisumu, Kenya, and conducted analyses based on 959 person-months in which respondents had been sexually active in nonmarital relationships. Dependent variables were inconsistent condom use (not *always* using a condom) and *never* use of condoms. Condoms were used inconsistently in 57% of months and were never used in 31%. Corroborating existing literature, lower household wealth and lower educational attainment were associated with inconsistent condom use. Lower individual economic status (lower earned income, food insufficiency, and larger material transfers from partners) were also important determinants of inconsistent condom use. There were no significant differences in these associations by gender, with the exception of food insufficiency, which increased the risk of inconsistent condom use for young women but not for young men. None of these individual measures of socioeconomic status were associated with *never* use of a condom. The findings suggest that both household- and individual-level measures of socioeconomic status are important correlates of condom use and that individual economic resources play a crucial role in negotiations over the highest level of usage. The results highlight the importance of poverty in shaping sexual behavior, and, in particular, that increasing individual access to resources beyond the household, including ensuring access to food and providing educational and work opportunities, could prove to be effective strategies for decreasing the risk of HIV among youth.

Keywords: sexual behavior; condom use; poverty; socioeconomic status; youth; sub-Saharan Africa

Introduction

Emerging research contends that poverty is a key driver of the HIV/AIDS epidemic in sub-Saharan Africa. The presumed linkage is that poverty compels individuals to seek out sexual relationships that provide them with financial or material support. In exchange, they are less able to insist on safe behaviors, such as using condoms consistently, thereby increasing their risk of infection (Gillespie, Kadiyala, & Greener, 2007; Kim, Pronyk, Barnett, & Watts, 2008). Young women are especially at risk because they tend to be economically dependent on their male partners.

Existing research on the relationship between poverty and sexual behavior has utilized limited measures of household and individual socioeconomic status. Most studies found that higher levels of household wealth (physical structure, assets, size, and income) are associated with consistent condom use (Hargreaves et al., 2002, 2007; Lopman et al., 2007; Madise, Zulu, & Ciera, 2007; Weiser et al., 2007). However, household wealth may not reflect the

level of resources available to the individual. Individual-level resources are likely to be influential in decisions about sexual behavior, including negotiating condom use with a partner.

Measures of individual socioeconomic status have generally been limited to educational attainment and school enrollment, which have been found to be associated with consistent condom use (Gillespie et al., 2007; Hargreaves et al., 2007; Kapiga & Lugalla, 2003; Lagarde et al., 2001), especially for women (Dinkelman, Lam, & Leibbrandt, 2007; Madise et al., 2007; Weiser et al., 2007). Education may provide individuals with greater access to economic resources and thereby decrease their dependence on relationships. Additionally, educated individuals may have more accurate knowledge about the causes of and protections against HIV transmission (Hargreaves & Glynn, 2002).

Importantly, individual income remains understudied in the context of sexual behavior in sub-Saharan Africa, particularly among youth. This may reflect the difficulty of collecting accurate information

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in less-developed settings where work is often informal and sporadic. Researchers may also assume that young people are not employed or, if they are, that their earnings do not contribute substantially to their households. Moreover, other dimensions of poverty that reflect individual access to economic resources have been overlooked. One prime example is food insufficiency, or not having enough food to meet daily needs. A large literature has documented the negative effects of food insecurity on physical and psychological health outcomes for both young adults and children, suggesting that food insufficiency is an especially acute dimension of poverty (Alaimo, Olson, & Frongillo, 2002; Ashiabi & O'Neal, 2007; Casey et al., 2005; Cook et al., 2006; Hadley, Lindstrom, Tessema & Belachew, 2008). Nevertheless, linkages between food insufficiency and sexual behavior are under-researched (Gillespie et al., 2007; Weiser et al., 2007). The limited research includes a qualitative study in Nigeria, which found that food insufficiency was a primary motivation for entering and continuing commercial sex work (Oyefara, 2007). In addition, Weiser et al. (2007) demonstrated that food insufficiency was associated with inconsistent condom use for both male and female adults using survey data from Botswana and Swaziland.

Finally, research suggests that many young adults, including both males and females, engage in relationships for money or material assistance as a source of economic resources, particularly in settings where employment opportunities are limited (Chatterji, Murray, London, & Anglewicz, 2005; Dunkle et al., 2007; Kaufman & Stavrou, 2004; Luke, 2003; Meekers & Calvès, 1997). Although public discourse often focuses on “sugar daddy” and “sugar mommy” relationships (Luke, 2005), a large body of work has found that the exchange of money or gifts is widespread and occurs in relationships ranging from commercial sex to casual and more serious partnerships (Dunkle et al., 2007; Luke, 2010). While income earned through employment is expected to increase an individual's negotiating power within relationships, money and gifts (or “material transfers”) received from a partner could place more power over sexual decision-making in the partner's hands (Luke, Goldberg, Mberu, & Zulu, 2010). Few studies, however, have empirically evaluated the association between material transfers from partners and unsafe sexual behavior. Two studies in Kisumu, Kenya, the site of our research, found a negative association between material transfers men gave to their female partners and condom use (Luke, 2006; Luke et al., 2010), while a study of adolescent girls in four sub-Saharan African countries found no association between the receipt of

money or gifts and condom use (Moore, Biddlecom, & Zulu, 2007).

In this paper, we use unique life history survey data to examine the connections between multiple measures of individual- and household-level socio-economic status and consistent condom use among youth in Kisumu, Kenya, as well as to explore how these associations vary by gender. Nyanza Province, of which Kisumu is the capital, is an important setting for such analyses given its high concentrations of poverty and HIV infection. More than 73% of reproductive-age women and 65% of men in the Province have not completed primary school, and over 53% of households are in the bottom two wealth quintiles for the country (Central Bureau of Statistics [CBS], Ministry of Health [MOH], & ORC Macro, 2004). Furthermore, HIV prevalence is estimated at 14.9% in the province, more than double the national rate (National AIDS and STI Control Programme [NASCOP], 2009).

Methods

Data and sample

Survey data were collected with a life history calendar, called the Relationship History Calendar (RHC), which used a timeline format to gather retrospective monthly information on education, income, and relationship characteristics of youth for the 10 years before the survey. Life history calendars have been shown to enhance respondent recall of past events (see Belli & Callegaro, 2009; Freedman, Arland, Camburn, Alwin, & Young-DeMarcho, 1988), and an evaluation of the RHC suggested that it decreased social desirability bias and led to more valid reporting of multiple measures of sexual behavior compared to a traditional survey instrument (Luke, Clark, & Zulu, forthcoming). In addition to the retrospective information recorded on the RHC, an introductory questionnaire collected information on sociodemographic characteristics of respondents and their households at the time of the survey.

The sample was drawn by contacting every other household in 45 randomly selected urban enumeration areas in Kisumu mapped by the Government of Kenya's Central Bureau of Statistics. Young men and women aged 18–24 years in selected households were eligible to be interviewed; one eligible respondent was selected randomly from each household. The overall response rate was 94.9%, with no significant differences by sex (Luke et al., forthcoming). Ethical approval was obtained from the institutional review boards at all collaborating institutions.

Because the RHC gathered retrospective information on individual and relationship characteristics on a monthly basis for all respondents, the unit of the analysis is the person-month. Condom use behavior and most measures of socioeconomic status varied by month for each respondent. We restricted our analysis to information for the six months before the interview to ensure that person-month information collected on the RHC corresponded to current characteristics measured in the introductory questionnaire at the time of interview. We also restricted the analysis to months in which respondents were sexually active and therefore exposed to using condoms. Given that condom use is extremely low in marital relationships (CBS, MOH, ORC, 2004) and that negotiations over condom use are likely to be quite different than in nonmarital relationships, we further limited the analysis to months in which respondents were involved in at least one nonmarital relationship. Nonmarital relationships include all relationships of respondents who were not married in the month as well as any extramarital relationships of respondents who were married in the month. After omitting two respondents' monthly observations due to missing data, our final sample yielded 959 person-months that were distributed across 261 individuals.

Measures

Dependent variables

Consistent condom use (using a condom at every sexual encounter during the month) has the greatest potential for protecting against sexually transmitted infections, including HIV, and may also be the most difficult to negotiate with a sexual partner. Therefore, our first dependent variable was inconsistent use, coded 1 if respondents reported they used a condom most of the time, sometimes, very rarely, or never with any nonmarital partner in the month, and zero if they reported *always* using a condom with all partners during the month. Use of a condom intermittently continues to offer some degree of protection in contrast to never using a condom. Therefore, our second dependent variable was never use of a condom, coded 1 if respondents did not use a condom with all nonmarital partners in the month and zero for any level of use (always, most of the time, sometimes, or very rarely) with any nonmarital partner in the month. We included both measures of condom use because we expected that predictors of negotiations of the highest level of use might differ from those of more irregular use.

Independent variables

Measures of household socioeconomic status included, first, household wealth at the time of interview. We used principal components analysis to create an index from 14 items related to household assets, utilities, and infrastructure and divided these scores into wealth quintiles (Luke et al., forthcoming). Second, household size at the time of interview was measured as the number of individuals currently residing in the household.

Measures of individual socioeconomic status included highest level of education completed at the time of the survey, school enrollment in the month (time-varying), earned income in the month in Kenyan shillings (70 Ksh = US\$1) (time-varying), and the total amount of material transfers (money, gifts, or assistance) received in the month in Kenyan shillings from all nonmarital partners (time-varying). Monthly income and material transfers were divided by 1000 in the regression analyses for ease of interpretation. Food insufficiency was a dichotomous variable, coded 1 if the respondent missed meals on four or more days in the month before the survey due to shortages of food or money, zero if they missed meals on less than four days. We were concerned that our measures of individual and household economic status would be highly correlated; however, no two variables had a Pearson's correlation coefficient greater than 0.40, suggesting that these seven measures represented distinct dimensions of socioeconomic status in the Kisumu context.

Control variables included age, gender, ethnicity, and religion, all of which were time invariant; multiple sexual partners in the month (one or more than one) (time-varying); and whether the respondent had a casual partner in the month (coded 1 if the respondent considered any partner in the month casual, one-night stand, or commercial sex, from a list of relationship types) (time-varying).

Data analysis

Differences between independent variables and our two measures of condom use were assessed by chi-square and two-tailed *t*-tests for independence. Multiple logistic regression analysis was used to explore the association between indicators of socioeconomic status and condom use, controlling for other individual characteristics. To account for clustering by person-months for the same individual, we used the "robust cluster" command in Stata. In order to evaluate gender differences, we constructed a gender interaction term for each measure of socioeconomic status and added them one at a time to our regressions. Only the

interaction between gender and food insufficiency was significant and was included in final analyses.

We present two regression models for each dependent variable. Model 1 included the household- and individual-level socioeconomic variables that are typically analyzed in studies of unsafe sexual behavior: household wealth, household size, level of education, and current school enrollment. Model 2 incorporated additional individual measures of socioeconomic status that were available in our study: earned income, material transfers received from partners, and food insufficiency.

Results

Table 1 provides summary statistics. The mean age of respondents across our sample of persons-months was 20 years, and in 77% of months respondents were not enrolled in school. The mean monthly income was Ksh 2,323 (approximately US\$33) and the mean amount received in material transfers from all partners was Ksh 738 (US\$10) per month. In 15% of months, respondents were food insufficient. Respondents were involved with more than one nonmarital sexual partner in 9% of months. Condoms were used inconsistently in 57% of person-months (always used in 43%) and never used in 31%.

Results of bivariate tests of independence are presented in Table 2. There were significant associations between most measures of household- and individual-level socioeconomic status and inconsistent and never condom use.

Results of the logistic regression analyses are presented in Table 3. In Model 1, we found that households in the fourth wealth quintile had significantly greater odds of inconsistent condom use (OR 2.89, 95% CI 1.25–6.68) and of never using a condom (OR 3.15, 95% CI 1.13–8.78) compared to those in the wealthiest quintile. Those with less than a primary school education were approximately three times more likely to inconsistently use a condom than those with a secondary education or more (OR 2.93, 95% CI 0.96–8.90, marginally significant). Not currently attending school was associated with never using a condom (OR 2.27, 95% CI 0.97–5.30, marginally significant).

With the inclusion of additional individual-level socioeconomic status variables in Model 2, the associations between household economic status and condom use remained similar to those in Model 1. In addition, the odds of inconsistent condom use increased and became marginally significant for those in the third wealth quintile compared to the wealthiest quintile (2.58, 95% CI 0.92–7.30). The odds of

Table 1. Summary statistics for independent and dependent variables in nonmarital, sexually active person-months of youth in Kisumu, Kenya.

	Frequency (<i>N</i> = 959)	(% or Mean)
<i>Individual characteristics</i>		
Age (years)	–	20
Male	536	56
Ethnicity		
Other	89	9
Luo	765	80
Luhya	105	11
Religion		
Other/no religion	297	31
Catholic	265	28
Protestant	397	41
Had casual partner	202	21
Had 2+ partners	91	9
<i>Household socioeconomic status</i>		
Household wealth		
1st quintile (poorest)	176	18
2nd quintile	184	19
3rd quintile	163	17
4th quintile	244	25
5th quintile (wealthiest)	192	20
Household size	–	4
<i>Individual socioeconomic status</i>		
Highest level of education		
None or incomplete primary	119	12
Incomplete secondary or vocational	498	52
Complete secondary and above	342	36
Not currently enrolled in school	741	77
Earned income in Ksh	–	2323
Total amount of material transfers rec'd from partners in Ksh	–	738
Food insufficient	141	15
<i>Unprotected Sex</i>		
Inconsistent condom use	548	57
Never condom use	300	31

never using condoms for those in the poorest quintile also reached marginal significance (OR 3.07, 95% CI 0.83–11.44) compared to the wealthiest quintile. Furthermore, the marginally significant associations between education and inconsistent condom use and school enrollment and never use of condoms became significant at the 0.05 level.

The measures of individual socioeconomic status unique to Model 2 were significantly associated with inconsistent condom use but not with never using a condom. Higher amounts of monthly income

Table 2. Inconsistent and never condom use and independent variables in nonmarital, sexually active person-months of youth in Kisumu, Kenya ($N = 959$).

	Inconsistent condom use			Never condom use		
	No ($N = 411$) (% or Mean)	Yes ($N = 548$) (% or Mean)	p -Value	No ($N = 659$) (% or Mean)	Yes ($N = 300$) (% or Mean)	p -Value
<i>Individual characteristics</i>						
Age (years)	20	20	0.741	20	20	0.952
Gender						
Female	44	45		43	47	
Male	56	55	0.764	57	53	0.224
Ethnicity						
Other	11	8		7	13	
Luo	79	80		81	78	
Luhya	9	12	0.080 +	12	9	0.009***
Religion						
Other/No religion	23	37		30	33	
Catholic	29	27		26	31	
Protestant	48	36	0.000***	44	36	0.049*
Had casual partner						
No	73	83		76	86	
Yes	27	17	0.000***	24	14	0.000***
Had 2 + partners						
No	91	90		87	97	
Yes	9	10	0.504	13	3	0.000***
<i>Household socioeconomic status</i>						
Household wealth						
1st quintile (poorest)	16	20		15	25	
2nd quintile	20	18		21	14	
3rd quintile	16	18		16	20	
4th quintile	20	30		23	31	
5th quintile (wealthiest)	28	14	0.000***	25	10	0.000***
Household size	4	4	0.431	4	4	0.326
<i>Individual socioeconomic status</i>						
Highest level of education						
None or incomplete primary	7	16		10	18	
Incomplete secondary or vocational	52	52		53	50	
Complete secondary and above	40	32	0.000***	37	33	0.004**
Not currently enrolled in school						
No	25	21		27	13	
Yes	75	79	0.100	73	87	0.000***
Earned income in Ksh	2783	1979	0.005**	2450	2045	0.137
Total amount of material transfers received from partners in Ksh	609	835	0.022*	834	528	0.002
Food insufficient						
No	88	83		85	86	
Yes	12	17	0.022*	15	14	0.678**

Notes: 2-sided t-test for means; chi-square tests for categorical variables.

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; + $p < 0.10$.

decreased the odds of inconsistent condom use (OR 0.94 per Ksh 1000, 95% CI 0.87–1.01, marginally significant). Food insufficiency increased the odds of inconsistent condom use for women (OR 5.24, 95% CI 1.05–26.22). Young men with experience of food insufficiency were no different in condom use than men who were not food insufficient (not shown), and

based on the gender interaction term, men with food insufficiency were significantly less likely than food insufficient women to use condoms inconsistently. The total amount of transfers received from nonmarital partners was associated with inconsistent condom use (OR 1.17 per Ksh 1000, 95% CI 0.99–1.38, marginally significant).

Table 3. Logistic regression analyses of inconsistent and never condom use in nonmarital, sexually active person-months of youth in Kisumu, Kenya ($N=959$).

	Inconsistent condom use						Never condom use					
	Model 1			Model 2			Model 1			Model 2		
	95% CI			95% CI			95% CI			95% CI		
	OR	Low	High	OR	Low	High	OR	Low	High	OR	Low	High
<i>Individual characteristics</i>												
Age (years)	1.03	0.89	1.21	1.03	0.88	1.22	1.01	0.85	1.20	1.04	0.88	1.24
Male	1.15	0.61	2.17	1.76	0.88	3.52	0.94	0.47	1.90	1.27	0.59	2.71
Ethnicity												
Other (ref)	–	–	–	–	–	–	–	–	–	–	–	–
Luo	1.48	0.56	3.93	1.53	0.50	4.68	0.48	0.18	1.32	0.46	0.17	1.25
Luhya	1.56	0.39	6.24	1.79	0.42	7.66	0.33	0.08	1.39	0.36	0.09	1.47
Religion												
Other/no religion (ref)	–	–	–	–	–	–	–	–	–	–	–	–
Catholic	0.56	0.25	1.25	0.54	0.25	1.20	1.07	0.49	2.36	0.96	0.43	2.15
Protestant	0.53	0.26	1.06+	0.53	0.26	1.09+	0.81	0.38	1.71	0.68	0.32	1.46
Had casual partner	0.36	0.17	0.76**	0.32	0.15	0.66**	0.57	0.26	1.25	0.55	0.26	1.15
Had 2+ partners	2.10	0.82	5.42	2.04	0.83	4.97	0.23	0.08	0.68**	0.22	0.07	0.69**
<i>Household socioeconomic status</i>												
<i>Household wealth</i>												
1st quintile (poorest)	1.49	0.50	4.40	1.62	0.54	4.92	2.78	0.79	9.80	3.07	0.83	11.44+
2nd quintile	1.52	0.59	3.93	1.45	0.55	3.85	1.35	0.40	4.53	1.19	0.35	4.08
3rd quintile	2.27	0.81	6.35	2.58	0.92	7.30+	2.34	0.72	7.55	2.45	0.76	7.85
4th quintile	2.89	1.25	6.68*	2.95	1.21	7.18*	3.15	1.13	8.78*	3.04	1.06	8.74*
5th quintile (wealthiest) (ref)	–	–	–	–	–	–	–	–	–	–	–	–
Household size	0.97	0.85	1.11	0.92	0.81	1.04	0.97	0.82	1.14	0.94	0.80	1.11
<i>Individual socioeconomic status</i>												
<i>Highest level of education</i>												
None or incomplete primary	2.93	0.96	8.90+	3.09	1.02	9.35*	1.60	0.55	4.65	1.46	0.48	4.41
Incomplete secondary or vocational	1.18	0.63	2.22	1.19	0.62	2.29	1.14	0.57	2.28	1.25	0.61	2.56
Complete secondary and above (ref)	–	–	–	–	–	–	–	–	–	–	–	–
Not currently enrolled in school	1.16	0.59	2.30	1.48	0.71	3.10	2.27	0.97	5.30+	2.81	1.11	7.09*
Earned income (1000 Ksh)	–	–	–	0.94	0.87	1.01+	–	–	–	0.94	0.87	1.03
Total amount of material transfers received from partners (1000 Ksh)	–	–	–	1.17	0.99	1.38+	–	–	–	0.89	0.69	1.16
Food insufficient	–	–	–	5.24	1.05	26.22*	–	–	–	1.99	0.58	6.85
Food insufficient * male	–	–	–	0.12	0.02	0.76*	–	–	–	0.13	0.02	0.71*

Notes: OR = odds ratio; CI = confidence interval.

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; + $p < 0.10$.

In Model 2, having a casual partner decreased the odds of inconsistent condom use (OR 0.32, 95% CI 0.15–0.66) and having multiple sexual partners decreased the odds of never using a condom (OR 0.22, 95% CI 0.07–0.69). In both models, Protestants were less likely to be inconsistent condom users (marginally significant) than those of no or other religions, perhaps because some Protestant groups in Kenya do not have strong positions that discourage condom use.

Conclusion

This paper explored the relationship between multiple measures of socioeconomic status and two levels of condom use – inconsistent use (not *always* using a condom) and *never* using a condom – in a population of youth in urban Kisumu, Kenya. A major strength of the study was the incorporation of both household- and individual-level measures of socioeconomic status. Interestingly, not all dimensions of poverty showed the same associations with these two

measures of protection. We found that young men and women living in households with lower levels of wealth were more likely to inconsistently use and never use a condom compared to those in the wealthiest households, which corroborates existing research (Hargreaves et al., 2002, 2007; Lopman et al., 2007; Madise et al., 2007; Weiser et al., 2007). Individual-level measures of socioeconomic status were also important. The lowest level of schooling, lower amounts of income, and larger amounts of money and gifts received from sexual partners were associated with inconsistent condom use. The association between material transfers and inconsistent condom use, in particular, provides support for the view that economic benefits of relationships are traded off with unsafe sexual behavior (Luke, 2006). Additionally, food insufficiency was associated with inconsistent condom use for young women, not both sexes, which differs from findings among adults in Botswana and Swaziland (Weiser et al., 2007). These results suggest that young women and men who are food insufficient may employ different strategies to secure economic resources. Furthermore, women are generally responsible for household food provision in sub-Saharan Africa (Hyder et al., 2005) and thus may feel greater pressure than young males to provide for themselves and others, further fueling their pursuit of alternative economic resources in poor urban settings.

All individual measures of socioeconomic status were significant predictors of consistent use of condoms at each sexual encounter; however, they were not associated with never using condoms, with the exception of current school enrollment, which lowered the odds of never using a condom. These findings suggest that young people with greater economic resources gain decision-making power within their relationships, and they use this power to insist on always using a condom, the highest level of protection.

Our study had several limitations. First, while our measures of school enrollment, income, and material transfers from sexual partners varied by month and could be linked to condom use within each month, other variables were measured at the time of the survey only. This could mask monthly movements in and out of poverty and also could dampen important associations between poverty and condom use. Second, our measures of socioeconomic status may not be direct determinants of unsafe sexual behavior, and other characteristics of respondents that correlated with socioeconomic status could explain the connection between poverty and

lower condom use, such as perceptions of risk (Hargreaves et al., 2009) or information or support networks (Boileau, Zunzunegui, & Rashed, 2009). Future studies should continue to collect details on both individual- and household-level socioeconomic status as well as information on other probable key pathways to poor health outcomes among youth.

Overall, our study highlights the importance of socioeconomic status in shaping sexual behavior among youth, and how the linkages between poverty and HIV risk go beyond household wealth and education to include dimensions of individual economic status, including food insufficiency and income. The results also have implications for policies and programs. Increasing individual resources, including access to food (particularly for young women) and educational and work opportunities, could prove to be effective strategies for decreasing the risk of HIV among youth. Indeed, employment opportunities could decrease the need to rely on sexual relationships for economic support while simultaneously increasing individuals' negotiating power to practice protective sexual behaviors.

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