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The impact of a national poverty reduction program on the characteristics of sex partners among Kenyan adolescents

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Introduction

A disproportionate burden of the HIV epidemic falls on adolescents, particularly those living in sub-Saharan Africa. Young people between the ages of 10–24 account for approximately half of all new HIV infections globally, and nearly three-quarters of all HIV positive youth between the ages of 15–24 live in sub-Saharan Africa (1). Creating and implementing effective interventions to prevent the spread of HIV in this population is critical.

Cash transfer programs, which offer small, regular cash payments to poor families as part of a social protection strategy, have recently emerged as a potential tool to prevent the spread of HIV, particularly among adolescents (2). Cash payments can either be unconditional with no prerequisites for receipt, or conditional on certain desirable behaviors such as school attendance, vaccinations, or health care utilization. Several studies have shown positive effects of conditional and unconditional cash transfer programs on education and early childhood health outcomes (3, 4). One study has recently demonstrated success in reducing HIV prevalence with a conditional cash transfer program among young women (5), and more research is currently underway (6, 7). Beyond simply demonstrating a reduction in HIV risk, it is also important to understand how cash transfer programs may influence risk in order to better understand disease etiology and to more efficiently tailor interventions to maximize their HIV preventive potential.

One set of hypotheses for how cash transfer programs may influence HIV risk involves the premise that exposure to grants puts recipients in contact with safer sex partners. This shift in sex partner characteristics may occur through two different, though not mutually exclusive, mechanisms. Exposure to cash transfer programs may: 1) Keep recipients in school longer, where they are more likely to find partners close to their own age and therefore less likely to be HIV-uninfected, or 2) Offset the economic motive to engage in transactional sex. Supporting this line of thinking, one previous study has reported that receipt of a cash transfer was associated with adolescent women choosing younger sex

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partners, though effects on other potentially risky partner characteristics were not reported (5).

These proposed mechanisms may be present under a variety of cash transfer program characteristics. Conditional cash transfers targeted to adolescents may influence sex partner characteristics because payments can be made contingent on undertaking a desirable behavior such as school attendance. Unconditional transfers at the household level (as national poverty alleviation programs are often structured) could potentially shift adolescent sex partner characteristics, as well. Although not enforced by conditionality, the income effect at the household level has the potential to allow families to prioritize sending the children in their care to school for longer. Likewise, the extra household income, though diffuse, could potentially reach and offset the economic motive for transactional sex for each household member, including adolescents.

The Cash Transfer for Orphans and Vulnerable Children (CT-OVC) program is administered by the Government of Kenya and currently reaches 135,000 households and benefits over 350,000 vulnerable children (8). Households caring for an orphan or vulnerable child are provided with an unconditional cash transfer of Kenya Shillings (KES) 1,500 per month (US$22). This amount is, on average, about 15% of the median monthly per capita expenditures of recipient households. Household receipt of the grant has been associated with several benefits, including increases in school enrolment, food consumption expenditures, and health expenditures (4, 9). A recent evaluation of the four-year impact of CT-OVC on the sexual behavior of adolescents living in study households found that receipt of the grant was significantly associated with delayed sexual debut, and weakly associated with a reduced number of partners and unprotected sex acts (10). In this paper, we explore whether household receipt of CT-OVC is also associated with adolescent sex partner characteristics.

Methods

As part of an *a priori* monitoring and evaluation plan, in 2007, a sample of eligible households was randomly assigned to receive the CT-OVC grant (n=1540) or to act as controls (n=754) at a rate of 1:2 (control: intervention), stratified by geographic location. Four years later, data were collected on the demographics, sexual behavior, and psychosocial status of adolescents (age 15–25) living in study households. Further details of the evaluation design and implementation have been published previously (4, 9).

We constructed the analytic sample by starting with the total number of adolescents involved in the four-year follow-up (n=2212). To minimize the potential for misclassification of exposure to the grant, we restricted this study population to only those who had lived in the study household for at least two years of the intervention (n=1879). Only those who reported having at least one sex partner in the last 24 months were asked questions about partner characteristics so the analysis was further restricted to this subgroup (n=684).

We used logistic regression models to estimate the effect of CT-OVC on each of three outcomes measuring partner characteristics: 1. *Relative partner age*, defined dichotomously as reporting current or most recent partner as older than respondent versus not older; 2. *Partner school status*, defined dichotomously as reporting current or most recent partner as enrolled in school versus not enrolled in school; and 3. *Transactional sex*, defined dichotomously as giving or receiving money, gifts, or favors for sex with most recent or current partner. We adjusted the models for important covariates that differed between the control and intervention arms at baseline.

In anticipation that the grant may affect young women and men differently, all analyses were stratified by sex. To assess whether the effects of the grant were different by age, we stratified by age with a cut-point dividing those 21 years old and younger at follow-up (17 and younger at baseline) from those over 21 at follow-up (over 17 at baseline). To assess whether the effect of the grant was different by school enrolment status, we stratified the sample into those who were currently enrolled in school and those who were not currently enrolled in school, at the time of follow-up assessment. Finally, to assess whether the effect of the grant was different by relative levels of baseline poverty, we stratified by baseline economic status. Economic status was measured as per capita monthly household consumption expenditures, calculated by summing all reported household consumption expenses and dividing by the total number of people living in the household (11, 12). To stratify by relative economic status, we split the population into those above- and below-median baseline expenditures.

Results

Overall, data on HIV risk behavior were collected on 2212 adolescents, and, of these, 1879 (84.9%) had lived in the household for at least two years of the intervention. 684 (52.4%) of these adolescents reported having at least one sex partner in the last 24 months; analyses were restricted to this sample. Intervention and control arms were well-balanced in terms of age, sex, education, baseline economic status, proportion living in households with female heads, and household size. Those in the intervention arm were significantly more likely to be the grandchild of the household head and less likely to be related to the household head through adoption. Intervention households were also significantly more likely to be located in Nairobi and more likely to have an older household head. Therefore, all further analyses were adjusted by relation to household head, Nairobi residence, and age of household head. Overall, just over a third (37%) of the respondents were women, just under one-half (44%) reported current enrolment in school, and most (65%) were 21 and younger at the time of the follow-up interview. Average monthly household expenditures per person was KES 1,450 (about $21USD).

In both crude and adjusted logistic models, the CT-OVC program appeared to have no statistically significant impact on relative partner age, partner school status or transactional sex, in either young women or young men, as presented in Table 1. There was also no significant impact of CT-OVC on partner characteristics when we stratified by age, school enrolment status, and baseline economic status.

A few notable patterns emerged in the stratified analyses, though small sample sizes and rare events limit the precision, and therefore interpretation, of the results. Interestingly, the point estimates for the effect of CT-OVC on transactional sex were on opposite sides of the null for men and women. Though neither result was statistically significant, we found that, in the full cohort, women in the intervention arm were less likely to report having had transactional sex than women in the control arm (aOR=0.79; 95%CI: 0.40, 1.58; χ^2=0.55; p=0.51), while men in the intervention arm were more likely to report having had transactional sex than men in the control arm (aOR=1.57; 95% CI: 0.60, 4.07; χ^2=0.85; p=0.36).

This pattern of a protective point estimate for transactional sex among women appears to be entirely driven by those in the younger age category (aOR: 0.65; 95% CI: 0.30, 1.42; χ^2=1.18; p=0.28) and those currently enrolled in school (aOR: 0.38; 95% CI: 0.13, 1.11; χ^2=3.15; p=0.08), while the pattern of a point estimate above the null for transactional sex among men appears to be driven by those in the older age category (aOR: 2.96; 95% CI: 0.62, 14.08; χ^2=1.85; p=0.17). The pattern is also more apparent among those with higher baseline economic status; the point estimate among women is further below the null

(aOR=0.65; 95%CI: 0.23, 1.80; χ^2=0.69; p=0.41), while the point estimate among men is further above the null (aOR=3.21; 95%CI: 0.68, 15.31; χ^2=2.16; p=0.14), compared to the unstratified results. In this high economic status subgroup, among males, having had transactional sex appears to be associated with having a younger partner: of the 14 men who reported having had a transactional sex-based relationship, 12 (85.7%) also report having a younger partner. In general, the results from the stratified analyses do not reveal any similar pattern of CT-OVC influence on relative partner age or partner school status.

Discussion

Overall, the results of this study suggest that the CT-OVC program does not significantly influence sex partner characteristics among Kenyan adolescents. There are several potential explanations as to why we do not observe an effect of the CT-OVC program on partner characteristics. First, the program may be too diffuse to have significant impacts on adolescents living in grant-receiving households. Unlike other programs that have documented an effect of cash transfers on HIV risk, CT-OVC does not make payments directly to the adolescent; rather, the money is given to the household head to be used to offset the costs of raising an orphan or vulnerable child and is a flat transfer irrespective of household size. As the CT-OVC program does not directly target adolescents with the objective of reducing HIV risk, changes in partner characteristics due to the grant may be unlikely.

Second, the point estimates varied widely between different subgroups, with implications for the validity, precision, and statistical significance of our results. Because the estimates were so different in different sub-groups, and often on opposite sides of the null, we chose to report the finely stratified analyses. However, these fine stratifications decreased the sample size considerably so that even seemingly strong associations were not statistically significant. There is thus a need for further studies that are specifically powered to examine the effects of cash transfers on sex partner characteristics even when stratified by these important subgroups.

A final potential explanation for why we did not observe an impact of the CT-OVC program on sex partner characteristics concerns the fact that the questions about sex partner characteristics were, naturally, only asked of those adolescents who were sexually active. However, a previous analysis demonstrated that CT-OVC reduces the likelihood of sexual debut (10). Therefore, there are fewer participants in the intervention arm who have sexual partners at follow-up. As the observed sample of intervention adolescents does not include those who theoretically would have gone on to have sex during follow-up without the impact of the intervention, the comparison of partner characteristics between intervention and control adolescents may not be valid. This is particularly problematic as the influence of the intervention is likely not random, but associated with the general risk profile of an individual: those influenced by the grant to delay sexual debut were likely those with low or intermediate risk profiles. Therefore, those in the intervention group who go on to become sexually active during follow-up may have higher risk profiles than those sexually active in the control group. If correct, this circumstance would bias our results toward the null. Unfortunately, we were unable to explore this potential explanation further as a measure of general risk proclivity was not collected in this dataset.

Several patterns of results appeared in the sub-analyses we performed by sex, age, school enrolment, and baseline economic status that merit discussion here, though we emphasize that only a very cautious interpretation is justified due to the imprecise estimates. In the full sample, the grant appeared to be protective against transactional sex among younger women and women enrolled in school; among older men, the grant appeared to be associated with

an increased risk of transactional sex. We hypothesize that the household receipt of the grant, though diffuse, may have affected men and women differently. The extra household income provided by the grant may have allowed men, particularly relatively older men, to provide gifts or money to their partners in return for sex. In a previous analysis, we have demonstrated that the grant is associated with decreased marriage among young men, which may also help explain this association if unmarried men are more likely to engage in transactional sex than married men (13). Among younger women and women enrolled in school, the grant may have reduced the financial need to engage in sex for money. A similar differential effect of cash transfers on risk behavior by sex has been noted in other settings (14); however, the precision and interpretation of our results is limited by small sample size and small number of events. Further research is needed to explore the potentially different effects of cash transfers on HIV risk between men and women, particularly given that the vast majority of current research focuses exclusively on women.

We also present preliminary evidence that household economic status influences the sex-specific results. In general, the estimates are larger in magnitude (though not statistically significant) in households with above- median baseline expenditures compared to those with below-median baseline expenditures. It is possible that, among low economic status households, the grant is not large enough to make a difference in sexual behavior or that the grant money is prioritized for use towards more pressing expenditures. Perhaps the money given to households with higher economic status can more easily be used as disposable income for the adolescents living within the households. Again, this has different implications for young men and women: young men are more likely to report having had transactional sex, while young women are less likely. Further supporting this hypothesis is that young men in higher economic status households who receive the grant tend to report younger partners compared to controls.

There are several important strengths to this analysis. This study is, to our knowledge, the first to examine the impact of a large-scale national cash transfer program on the sex partner characteristics of adolescents. Several national cash transfer programs in Africa have design features and target groups that are similar to the Kenya program, including those in Ghana, Malawi and Zambia, thus enhancing the relevance of the results to other countries. Second, the exposure to the CT-OVC grant was randomly assigned, decreasing the potential for confounding by variables that would have been associated with grant receipt under an observational study design. Finally, the longitudinal design of the study allows for a clearer assessment of the temporality between the exposure and outcome.

There are also several important points to consider when interpreting the results of this study. The sex partner characteristics outcomes used in the analysis were self-reported by the adolescents and therefore subject to bias. The partner age variable was also crudely measured (“older” vs. “non-older”) which may be masking effects at finer age difference stratifications. Importantly, although the overall four-year follow-up sample size was large, the fact that fewer young adults went on to have sexual partners over the course of follow-up limited the size of the analytic sample. Finally, rare events and even smaller sample sizes in the stratified subgroups further limited the precision of the estimates, which the original evaluation was not powered to assess.

As cash transfer programs become more popular as tools to reduce poverty and improve the human capital of children and young people, it is important to understand the mechanisms through which such programs may also bring about a reduction in HIV risk. Here, we provide evidence that the Kenyan CT-OVC program does not influence the sex partner characteristics of adolescents living in grant-receiving households as a whole. However, we provide preliminary evidence that context and demographics matter when it comes to the

potential of a national cash transfer program to influence sex partner characteristics: the grant tends to have different associations with sex partner characteristics depending on the age, sex, school enrolment, and baseline economic status of the participants. Future studies based on large-scale programs should be powered to detect differences within these subgroups to better understand the complex relationship between cash transfers and partner characteristics and thereby determine how to maximize their potential to prevent new HIV infections.

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Table 1

The associations between CT-OVC receipt and sex partner characteristics, stratified by sex, age, school enrolment status, and baseline economic status

Partner characteristic	Intervention N (%)	Control N (%)	aOR[1] (95% CI)	Wald χ^2 statistic	p-value (aOR)
Full cohort (n=684)					
Women (n=253)					
Older	73/160 (45.6)	41/88 (46.6)	0.94 (0.55, 1.62)	0.05	0.83
In school	64/165 (38.8)	40/87 (46.0)	0.77 (0.45, 1.33)	0.85	0.36
Transactional	29/164 (17.7)	17/88 (19.3)	0.79 (0.40, 1.58)	0.44	0.51
sex					
Men (n=431)					
Older	43/280 (15.4)	26/143 (18.2)	0.76 (0.43, 1.33)	0.93	0.33
In school	198/284 (69.7)	100/144 (69.4)	1.11 (0.70, 1.76)	0.21	0.65
Transactional	21/285 (7.4)	6/145 (4.1)	1.57 (0.60, 4.07)	0.85	0.36
sex					
Age 21 and under (n=443)					
Women (n=168)					
Older	44/102 (43.1)	23/63 (36.5)	1.33 (0.66, 2.66)	0.63	0.43
In school	55/105 (52.4)	36/63 (57.1)	0.90 (0.46, 1.74)	0.11	0.74
Transactional	21/104 (20.2)	16/63 (25.4)	0.65 (0.30, 1.42)	1.18	0.28
sex					
Men (n=275)					
Older	28/179 (15.6)	14/89 (15.7)	0.93 (0.44, 1.94)	0.04	0.84
In school	144/183 (78.7)	73/90 (81.1)	1.01 (0.52, 2.00)	<0.01	0.96
Transactional	9/183 (4.9)	4/91 (5.5)	0.96 (0.27, 3.40)	<0.01	0.95
sex					
over age 21 (n=241)					
Women (n=85)					

Partner characteristic	Intervention N (%)	Control N (%)	aOR[1] (95% CI)	Wald χ^2 statistic	p-value (aOR)
Older	29/58 (50.0)	18/25 (72.0)	0.40 (0.14, 1.13)	2.97	0.08
In school	9/60 (15.0)	4/24 (16.7)	0.84 (0.22, 3.15)	0.07	0.79
Transactional	8/60 (13.3)	1/25 (4.0)	*	*	*
sex					
Men (n=156)					
Older	15/101 (14.9)	12/54 (22.2)	0.57 (0.23, 1.38)	1.56	0.21
In school	54/101 (53.5)	27/54 (50.0)	1.27 (0.64, 2.53)	0.46	0.5
Transactional	12/102 (11.8)	2/54 (3.7)	2.96 (0.62, 14.08)	1.85	0.17
sex					
In school (n=291)					
Women (n=101)					
Older	18/64 (28.1)	8/36 (22.2)	1.47 (0.53, 4.09)	0.55	0.46
In school	46/65 (70.8)	26/36 (72.2)	1.02 (0.39, 2.70)	<0.01	0.97
Transactional	9/64 (14.1)	10/36 (27.8)	0.38 (0.13, 1.11)	3.15	0.08
sex					
Men (n=190)					
Older	21/129 (16.3)	9/56 (16.1)	0.92 (0.38, 2.23)	0.03	0.86
In school	111/131 (84.7)	53/57 (93.0)	0.54 (0.17, 1.71)	1.09	0.30
Transactional	6/131 (4.6)	2/58 (3.5)	1.29 (0.24, 6.93)	0.09	0.77
sex					
Out of school (n=375)					
Women (n=141)					
Older	50/89 (56.2)	29/48 (60.4)	0.83 (0.39, 1.74)	0.24	0.62
In school	18/93 (19.4)	13/47 (27.7)	0.57 (0.24, 1.33)	1.69	0.19
Transactional	19/93 (20.4)	7/48 (14.6)	1.27 (0.47, 3.43)	0.23	0.63
sex					
Men (n=234)					

Partner characteristic	Intervention N (%)	Control N (%)	aOR[1] (95% CI)	Wald χ^2 statistic	p-value (aOR)
Older	20/146 (13.7)	15/85 (17.7)	0.72 (0.32, 1.58)	0.68	0.41
In school	83/148 (56.1)	47/85 (55.3)	1.00 (0.57, 1.78)	<0.01	0.99
Transactional	15/149 (10.1)	4/85 (4.7)	1.81 (0.56, 5.88)	0.99	0.32
sex					
Below-median baseline expenditures (n=321)					
Women (n=125)					
Older	39/83 (47.0)	20/38 (52.6)	0.82 (0.36, 1.84)	0.23	0.63
In school	28/87 (32.2)	14/37 (37.8)	0.72 (0.30, 1.69)	0.57	0.45
Transactional	19/87 (21.8)	8/38 (21.1)	0.86 (0.32, 2.31)	0.09	0.76
sex					
Men (n=196)					
Older	23/134 (17.2)	9/57 (15.8)	1.24 (0.51, 3.04)	0.23	0.63
In school	92/138 (66.7)	41/56 (73.2)	0.83 (0.40, 1.72)	0.83	0.62
Transactional	8/138 (5.8)	4/57 (7.0)	0.70 (0.20, 2.51)	0.29	0.59
sex					
Above-median baseline expenditures (n=363)					
Women (n=128)					
Older	34/77 (44.2)	21/50 (42.0)	0.97 (0.46, 2.06)	0.01	0.94
In school	36/78 (46.2)	26/50 (52.0)	0.93 (0.44, 1.97)	0.03	0.85
Transactional	10/77 (13.0)	9/50 (18.0)	0.65 (0.23, 1.80)	0.69	0.41
sex					
Men (n=235)					
Older	20/146 (13.7)	17/86 (19.8)	0.48 (0.22, 1.05)	3.36	0.07
In school	106/146 (72.6)	59/88 (67.1)	1.50 (0.81, 2.80)	1.67	0.2
Transactional	13/147 (8.8)	2/88 (2.3)	3.21 (0.68, 15.31)	2.16	0.14
sex					

[1] Adjusted for Nairobi residence, relationship to household head, and age of household head.

* Adjusted ORs and p-values are not calculated for strata where expected values of any cell size are less than 5.