

Introduction

Despite billions of dollars spent on programs designed to reduce risky sexual behavior, the annual number of incident HIV infections and other sexually transmitted infections (STIs) has not declined. The tragic reality is that many of these new infections could have been prevented. The AIDS epidemic as well as other negative reproductive health outcomes are, at their core, fueled by risky sexual behavior. Over 85 percent of HIV infections occur through sexual contact with an infected partner, and could have been avoided through the adoption of safer sexual practices (Askew & Berer, 2003). However, despite isolated – and often, temporary – successes at lowering transmission rates, behavioral change interventions promoting safer sexual practices have proven remarkably ineffective at stemming the tide of the epidemic. Based on previous research (Smith & Watkins, 2005; Watkins, 2004; Reniers, 2008; Poulin, 2007) we know that African men and women are actively trying to reduce their risk of HIV infection, just not in a manner we might expect. Instead, it appears that risk reduction strategies are dynamic, always adapting to varying levels of uncertainty and opportunity, adding a layer of complexity to understanding the association between behavior change intentions and actions. Uncertainty faced in the daily lives of those at risk for HIV infection may influence how intentions are formed and how pursuit of one life goal is selected over pursuit of another (Johnson-Hanks, 2007). Characterizing this uncertainty by gaining a more clear understanding of the reasons for discrepancies between intentions and actions in a particular cultural context may guide design of interventions that can alleviate some uncertainty or help people come up with strategies for managing the uncertainty, and specifically, avoiding HIV infection.

The purpose of this paper is to explore reported intended sexual behavior change strategies and their corresponding behavior change actions implemented to avoid unsafe sex among participants enrolled in an economic-based HIV prevention intervention trial conducted in rural Tanzania. By using panel data, this study offers a unique opportunity to observe the introduction of a clear incentive for behavior change and examine consistency between sexual behavior change intentions and actions while also exploring constraints participants might face in following through with behavior change intentions. The intervention, implemented as a randomized, controlled trial, is a cash transfer contingent upon testing negative for a panel of curable STIs. Neoclassical economic theory predicts that the conditional cash transfer (CCT) intervention would raise the price of risky sexual behaviors, since a near-time financial reward would become at risk, and thus would reduce risky sex. However, researchers from non-economic traditions (Blanc, 2001; Boerma & Weir, 2005; Gupta, 2008; Krishnan, Dunbar, Minnis, Medlin, Gerdtts, & Padian, 2008; Price & Hawkins, 2007) have focused more intensively on the role of cultural and institutional factors, particularly surrounding gender relations, that shape and constrain sexual behaviors, and how a CCT intervention might work to overcome such constraints. This paper focuses on anticipated and reported sexual behavior change as a result of being enrolled in the CCT, and attempts to address the following research questions:

- What factors are associated with reported **intent** to change behavior in the context of the CCT trial?
- What factors are associated with reported **actual** behavior change in the context of the CCT trial?
- What factors are associated with consistency between reported behavior change **intentions** and **actions**?

Methods

The results reported in this manuscript originate from data collected from a randomized, controlled trial (the RESPECT study) of a cash transfer conditional on negative STI tests at 4-month intervals over 12 months in all. The trial took place in Kilombero and Ulanga districts of Tanzania. The purpose of the RESPECT study is to understand the effectiveness of cash rewards, conditional on having negative tests for STIs, on prevention of risky sexual behaviors among young men and women in rural Tanzania. Study participants age 18 to 30 residing in ten villages within these two districts were randomly selected for participation. The study recruited approximately 2400 participants, approximately 240 in each of the 10 study villages.

Upon enrollment, all participants were randomized into either the intervention or control arm. All participants in both arms received free STI testing and counseling, and free STI treatment if needed at baseline, and at months 4, 8 and 12 and 24 of the study. In addition, all participants were tested for HIV at baseline and again at 12 months. Persons testing HIV-positive were referred for care and treatment, but retained in the study. Those in the intervention group received the conditional cash transfer upon receiving negative test results for selected curable STIs at months 4, 8, and 12. The control arm was not eligible to receive the cash award at any of the visits. All participants in both arms received a psychosocial intervention, comprised of regular group counseling. Half of

the participants in the intervention arm received approximately \$10 per award cycle, and half received approximately \$20 per award cycle if they remained negative. Quantitative questionnaires were administered at all study visits. We used data from the baseline study visit and the first follow-up visit (at 4 months) to examine consistency between sexual behavior change intentions as reported at baseline and sexual behavior change actions reported at four months. The specific language of the questions asked of study participants was as follows: At baseline: *Do you anticipate that your enrollment in this study will change your sexual behavior?* At 4 months: *Since the last round of testing four months ago, have you changed your sexual behavior?* Participants were also asked what type of behavior change they intended or engaged in. Using responses to these questions, we explored the hypothesis that new information received in the context of the study opens up new opportunities, lowering existing barriers to behavior change, and thus influencing whether stated intentions are acted upon.

Results

Of the 2420 participants enrolled at baseline, 1830 (75.6%) stated at their baseline structured interview that they anticipated that being part of the CCT trial would motivate them to change their sexual behavior. Females were less likely than males to report that they intended to change their sexual behavior as a result of study enrollment (72.9% compared to 81.6%, $p < 0.05$). Males were significantly more likely than females to anticipate abstaining and having sexual partners who were less risky. Females were significantly more likely than males to anticipate increasing their condom use as a result of study enrollment.

At the 4-month structured interview, 1122 (57.8%) of the 1943 returning study participants indicated that they had changed their behavior over the past four months as a result of being enrolled in the study. Of the 1122 participants reporting that they had changed their behavior over the previous four months as a result of study enrollment, 93 (8.3%) said that they had abstained, 491 (43.7%) reported having fewer sexual partners, 139 (12.4%) reported having less risky sexual partners, 332 (29.5%) said they had increased their condom use, and 32 (2.9%) reported treating their sexual infections. Significantly more males than females reported changing behavior (69.6% and 46.4%, respectively, $p < 0.05$). Significantly more males than females reported abstaining and having less risky partners over the 4-month period, while more females than males reported treating their sexual infections (4.4% and 1.8%, respectively, $p = 0.01$). There were no differences in reported type of change at Round 2 by intervention group.

Of the 1943 participants who returned for Round 2 of the study, 1469 (75.6%) said at baseline that they anticipated changing their sexual behavior as a result of being enrolled in the study. Of the 1469 intending to change their behavior, 908 (61.8%) reported actually doing so at the first follow-up visit of the study. Tables 1 and 2 show the consistency between sexual behavior change intentions and actions, stratified by gender. For both men and women, having fewer partners was the behavior change with the most consistency between reported intentions and reported actions—33.2% of males and 21.5% of females intending to reduce the number of partners they had reported having done so at 4 months. Twenty-seven percent of males and 20.3% of females intending to increase condom use reporting doing so at Round 2, 20.0% of males and 6.3% of females intending to abstain at baseline did so, and 8.0% of males and 1.8% of females had consistency of responses for having less risky partners.

Intentions to abstain were most frequently met by reported reduction in the number of sexual partners, perhaps indicating the difficulty of maintaining abstinence over time. Intentions to have partners that are less risky were followed up most frequently by reported reduction in sexual partners or increasing condom use at Round 2. The move away from the intention of having partners that are less risky could be a function of the difficulty often involved in assessing the risk of a potential or current partner. The majority of participants indicating that they would increase their condom use at baseline reported reducing the number of partners at the first follow-up visit—again this could be an indication of the difficulty that arises in trying to convince a partner to use condoms, or attempting to use condoms within a marriage. Having fewer sexual partners appeared to be the easiest type of change to follow through with stated intentions. It is important to note, however, that actions may not match intentions for several reasons, one of which is the new information participants received between the baseline and 4-month interviews—baseline HIV status, baseline STI status, and knowledge of their eligibility to receive a cash award contingent upon their test results.

In an effort to better understand the responses of participants relating to intentions of changing sexual behavior and reported changing of behavior, participant responses were grouped into four categories. Those five categories are as follows: people who said they would change and did (Intended Change); people who said they would not change but then reported changing at the first follow-up visit (Intended Change); people who said they

intended to change and did not report changing (Intended Lack of Change); people who said they did not intended to change and did not report change (Intended Lack of Change). Table 3 shows some demographic characteristics of study participants falling into these four categories. Men were more likely to fall into the Intended Change category than women and women were more likely to fall into the Unintended Lack of Change category. Single and divorced participants were more likely to follow through with sexual behavior change intentions during the first four months of the study compared to their married counterparts, as were those with more education (compared to those with no primary school education). Those in the high-value award group were more likely to fall into the Unintended Change category compared to those in the control group. Using multinomial logistic regression, we looked at factors associated with falling into each of these categories, with Intended Lack of Change as the comparison group. We found that being in the high value cash award group was significantly associated with falling into the Unintended Change category, while being male, educated, having a high perceived risk of current HIV infection, and not having exchanged sex for money or other material goods were significantly associated with falling into the Intended Change category.

Conclusion

We find some support for the notion that exposure to new and unexpected opportunities in the form of receipt of a positive STI test or being eligible for the cash award was associated with overall change. Ongoing analysis will address differences in these results by gender, and will utilize data from the additional follow-up visits of the study to further explore consistency between behavior change intentions and actions in the context of an incentive-based HIV prevention trial.

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Table 1: Intended Change at Baseline and Reported Change at First Follow-up (4-months), Males

Type of Change Anticipated at Baseline	Males: Reported Change at First Follow-up Visit					Total N (row pct)
	Any Change at R2 N (row pct)	Abstain N (row pct)	Fewer Sex Partners N (row pct)	Less Risky Sex Partners N (row pct)	Increase Condom Use N (row pct)	
Any Change at Baseline	567 (74.0)	54 (7.1)	247 (32.3)	81 (10.6)	176 (23.0)	766 (82.1)
No Change at Baseline	82 (49.1)	10 (6.0)	34 (20.4)	13 (7.8)	15 (9.0)	167 (17.9)
Will Abstain	55 (78.6)	14 (20.0)	24 (34.3)	7 (10.0)	15 (21.4)	70 (7.5)
Will Not Abstain	594 (68.8)	50 (5.8)	257 (29.8)	87 (10.1)	176 (20.4)	863 (92.5)
Will have fewer sexual partners	207 (73.9)	13 (4.6)	93 (33.2)	29 (10.4)	53 (18.9)	280 (30.0)
Will Not Have Fewer sexual partners	442 (67.7)	51 (7.8)	188 (28.8)	65 (10.0)	138 (21.1)	653 (70.0)
Will have sexual partners who are less risky	121 (74.7)	11 (6.8)	53 (32.7)	13 (8.0)	45 (27.8)	162 (17.4)
Will Not have sexual partners who are less risky	528 (68.5)	53 (6.9)	228 (29.6)	81 (10.5)	146 (18.9)	771 (82.6)
Will increase condom use	210 (78.7)	24 (9.0)	89 (33.3)	33 (12.4)	72 (27.0)	267 (28.6)
Will not increase condom use	439 (65.9)	40 (6.0)	192 (28.8)	61 (9.2)	119 (17.9)	666 (71.4)
Total	649 (69.6)	64 (6.7)	281 (30.1)	94 (10.1)	191 (20.5)	933 (100)

Table 2: Intended Change at Baseline and Reported Change at First Follow-up (4 months), Females

Type of Change Anticipated at Baseline	Females: Reported Change at First Follow-up Visit					Total N (row pct)
	Any Change at R2 N (row pct)	Abstain N (row pct)	Fewer Sex Partners N (row pct)	Less Risky Sex Partners N (row pct)	Increase Condom Use N (row pct)	
Any Change at Baseline	341 (48.5)	19 (2.7)	151 (21.5)	29 (4.1)	109 (15.5)	703 (72.9)
No Change at Baseline	106 (40.6)	6 (2.3)	49 (18.8)	11 (4.2)	26 (10.0)	261 (27.1)
Will Abstain	28 (53.3)	3 (6.3)	11 (22.9)	3 (6.3)	10 (20.8)	48 (5.0)
Will Not Abstain	419 (45.7)	22 (2.4)	189 (20.6)	37 (4.0)	125 (13.7)	916 (95.0)
Will have fewer sexual partners	112 (45.3)	7 (2.8)	53 (21.5)	10 (4.1)	37 (15.0)	247 (25.6)
Will Not Have Fewer sexual partners	335 (46.7)	18 (2.5)	147 (20.5)	30 (4.2)	98 (13.7)	717 (74.4)
Will have sexual partners who are less risky	53 (48.6)	3 (2.8)	21 (19.3)	2 (1.8)	21 (19.3)	109 (11.3)
Will have sexual partners who are less risky	394 (46.1)	22 (2.6)	179 (20.9)	38 (4.4)	114 (13.3)	855 (88.7)
Will increase condom use	160 (55.0)	6 (2.1)	66 (22.7)	12 (4.1)	59 (20.3)	291 (30.2)
Will not increase condom use	287 (42.6)	19 (2.8)	134 (19.9)	28 (4.2)	72 (27.0)	673 (69.8)
Total	447 (46.4)	25 (2.6)	200 (30.1)	40 (4.2)	135 (14.0)	964 (100)

Table 3: Consistency of Intentions at Baseline and Actions at First Follow-up

	Intended Lack of Change (N row %)	Unintended Change (N row %)	Unintended Lack of Change (N row %)	Intended Change (N row %)
Male	85 (9.1)	82 (8.8)	199 (21.4)	565 (60.7)
Female	155 (16.1)	107 (11.1)	362 (37.5)	342 (35.4)
Age (mean)	26.8 (se: 0.392)	27.0 (se: 0.475)	26.2 (se: 0.210)	26.8 (se: 0.187)
Single	35 (9.6)	34 (9.3)	80 (22.0)	215 (59.1)
Married	165 (13.4)	114 (9.3)	416 (33.9)	534 (43.5)

	Intended Lack of Change (N row %)	Unintended Change (N row %)	Unintended Lack of Change (N row %)	Intended Change (N row %)
Living Together	35 (15.4)	36 (15.8)	45 (19.7)	112 (49.1)
Divorced	5 (6.9)	5 (6.9)	18 (24.7)	45 (61.6)
Widowed	0 (0)	0 (0)	2 (50.0)	2 (50.0)
Low Income (<\$77 USD)	130 (13.7)	100 (10.5)	286 (30.1)	435 (45.7)
High Income (>= \$77 USD)	107 (11.4)	87 (9.3)	275 (29.4)	467 (49.9)
No Education	35 (17.6)	22 (11.1)	76 (38.2)	66 (33.2)
Some Primary School	180 (12.0)	145 (9.7)	441 (29.4)	736 (49.0)
Some Secondary School	25 (12.7)	22 (11.2)	44 (22.3)	106 (53.8)
Muslim	68 (9.6)	64 (9.0)	207 (29.2)	370 (52.2)
Catholic	83 (9.9)	93 (11.1)	245 (29.2)	419 (49.9)
Other Christian	84 (24.9)	30 (8.9)	107 (31.8)	116 (34.4)
Treatment-High Value	59 (11.3)	62 (11.9)	164 (31.5)	236 (45.3)
Treatment - Low Value	65 (12.7)	51 (9.9)	130 (25.3)	268 (52.1)
Control	116 (13.5)	76 (8.9)	264 (30.8)	401 (47.8)