

# HIV Testing, Behavior Change, and the Transition to Adulthood in Malawi

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## Abstract

For young adults living in countries with AIDS epidemics, getting an HIV test may influence near-term decisions, such as when to leave school, when to marry, and when to have a first child. These behaviors, which define the transition from adolescence to adulthood, have long-term implications on well-being and directly affect a person's risk of contracting HIV. Using an experimental

design embedded in a panel survey from Malawi, this study assesses the impact of voluntary counseling and testing of young adults for HIV on these decisions. The results show negligible intent-to-treat effect of HIV testing on behaviors. There is some suggestive evidence on differential response by wealth and by prior beliefs about one's status.

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## **HIV Testing, Behavior Change, and the Transition to Adulthood in Malawi<sup>1</sup>**

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## ***Introduction***

For young women and men, decisions regarding school attendance, sexual and marital partnerships, and fertility shape one's life-course and have long-term implications on well-being. Such decisions typically involve a trade-off between short-term and long-term utility in the face of much uncertainty. The AIDS epidemic in Sub-Saharan Africa further complicates the framework within which these kinds of trade-offs are considered. First, these decisions directly affect exposure to risk of HIV infection. Young people are well aware that some avenues toward adulthood (for example, leave school, marry soon after, have a child soon after) lead to different risk of exposure to HIV infection than others (Clark, Poulin, and Kohler 2009; Poulin 2007). Second, young people may face these pivotal decisions with uncertainty about their current HIV status and expected life horizon.

Young people in Sub-Saharan Africa are coming of age at a time when AIDS policy emphasizes HIV counseling and testing. International and local public health communities view HIV testing and the counseling that accompanies it as the gateway to treatment. But even for those who test negative, it is also hoped that testing will result in preventive behaviors that slow the spread of the epidemic.<sup>2</sup> There has been a rapid expansion of Voluntary Counseling and Testing (VCT) coverage in Malawi, achieved through outreach and mobilization initiatives such as Malawi's annual "Testing Week" and increased supply of such services (Angotti 2010; Angotti et al. 2011). Data from the 2004 Malawi Demographic and Health Survey (MDHS) show that only 15 percent of men had been tested during the previous year, whereas data from the DHS 2010 show that 51 percent of men had ever been tested and 31 percent of men reported having been tested in the past 12 months (NSO and ICF Macro, 2011). Women were more likely

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<sup>2</sup> For example, the Government of Malawi (2003) national policy document strongly motivates testing as a general prevention policy through theoretically reducing risky behaviors, as well as a mean to improve access treatment and mother-to-child prevention.

to have been tested in the past 12 months (72 percent tested). This partly reflects the introduction of testing through ante-natal surveillance sites in the early years of the epidemic.

In this paper we use the Marriage Transitions in Malawi (MTM) data set, a panel study of initially never-married young women and men in central Malawi, to evaluate how, if at all, VCT influences behaviors of young people. The survey introduced a testing opportunity for a random set of respondents during the second year of the three-year panel. We examine behaviors closely linked with the transition to adulthood and HIV risk. In particular, we estimate the intent-to-treat effect of the VCT intervention on school attendance, marriage, fertility, and reported sexual behavior in the year after the test.

Testing may alter these behaviors in several ways. Consider its potential effect on sexual behavior. If a man discovers he is negative, for example, he could commit to maintaining his status by carefully choosing partners, by choosing monogamy, by using condoms, or perhaps by seeking circumcision. A positive result might lead to a decision to engage in risky sexual behavior as incentives to protect against infection might no longer exist. On the other hand, this same man could be concerned about infecting others and therefore opt for safer behaviors.

Taking a broader view, removing uncertainty about one's status may affect expectations of young people about their life expectancy as well as opportunities that will be available to them in the future. In turn, it may alter present or near-term decisions with long-term implications, such as investments in human capital through staying in school, selection of partners, and timing of marriage and fertility. Beliefs about own HIV status can also translate into beliefs about the survival of (yet to be born) children, since the virus can be transmitted from mothers to their newborns. Therefore, learning one's status might affect the desired number and timing of births. Trinitapoli and Yeatman (2011), for example, find that compared to those who express certainty

they are HIV negative, those who are uncertain about their HIV status are likely to desire accelerated childbearing.

These mechanisms presume that individuals update their beliefs about their own status after learning their test result. Behavioral responses to a test therefore may depend on the extent to which one's beliefs about their infection status changed. For example, an unmarried, 18-year old woman who believes her likelihood of current infection to be low may be less likely to change her behavior following a negative test result compared to a young woman who believed her likelihood to be high but learns she is not infected.

VCT has the potential to affect behaviors beyond the impact of a revealed test result. A VCT intervention includes pre and post-test counseling by trained and certified counselors. During these sessions, counselors not only provide information about how to avoid infection but also encourage deliberate decision-making with respect to sexual and reproductive health (Angotti 2010). Therefore, although our data show that almost all respondents were aware of correct ways to avoid infection (see also Watkins 2004), the interactions with the counselors could have motivated them to behave in certain ways.

We begin our analysis by examining the overall effect of VCT on selected behaviors of young men and women. We then proceed to examine the effects of VCT by prior beliefs, employing empirical strategies similar to Boozer and Philipson (2000) and Gong (2012). The results of both analyses show a negligible effect of VCT on the considered behaviors, with modest effects for men suggesting a slower transition to adulthood. We then examine heterogeneous effects of VCT by household wealth. We choose to focus on wealth because our data, as well as other studies, show a very strong correlation between wealth and the behaviors that our study focuses on. Wealth affects not only the set of possible choices available to young

adults, but it can also influence expectations about opportunities and well-being in the future. The results of this analysis indicate that the VCT offer is associated with a lower marriage rates and initiation of fertility among poorer young women that report some likelihood to being infected and wealthier young men. This is ex-post analysis that was not in the experimental design. Therefore, while informative, the results should be cautiously interpreted.

### ***Evidence on Testing***

There are a handful of studies purposively designed to examine the impact of testing on risky sexual behaviors.<sup>3</sup> Delavande and Kohler (2012), in investigating this phenomenon with a sample of adults in Malawi, exploit a random assignment in vouchers for cash to be redeemed upon retrieval of one's test result from temporary VCT sites. They examine the effect of testing on a range of risky behaviors, and show that selectivity into testing is important for inferring the impact of testing. Learning one is HIV-positive results in fewer partners and more condom use up to two years later. Using the same voucher experiment as Delavande and Kohler, Thornton (2008) finds that individuals who receive a positive test result are more likely to purchase condoms two months later. However, she does not find a significant effect for those who learned a negative test result. She also does not find that beliefs on one's status prior to testing matters in terms of impact of testing.

Other studies have also considered the role of beliefs about own infection, and the updating of beliefs after learning a test result. Gong (2012), using data from Nairobi, Kenya and Dar es Salaam, Tanzania, finds that individuals who learn that they are positive (and did not think so before that test) are more likely to engage in risky sexual behavior after being tested,

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<sup>3</sup> Gersovitz (2011) discusses studies that explore the implications of testing with non-random testing. See also Potts (2008).

what he describes as an “unintended consequence of testing.”<sup>4</sup> In San Francisco, a very different setting but among the earliest empirical studies on the topic, Boozer and Philipson (2000) find that among unmarried individuals, testing induces a change in behavior only if the tested person was surprised by the test result. Like the Gong study, this finding stresses the importance of prior states of uncertainty, or prior beliefs, in learning the results of a test.

Baird et al (2013) report results of an experiment similar to the one described in this paper.<sup>5</sup> They have a sample of adolescent girls in one district in southern Malawi who were randomly offered VCT in 2009. The randomization was across communities (52 getting VCT and 36 with no VCT). The sample was re-interviewed 10 months later. They find that learning a positive test result lead to an increase in the likelihood of contracting Herpes Simplex Virus, with a higher likelihood of contraction for those surprised by the test result. Among those who tested negative, achievement test scores were improved, a finding they interpret to be that those with longer perceived life horizons have greater incentive to invest in human capital.

In this study, we evaluate the effect of testing on outcomes for both young women and men. We examine the effect of VCT on sexual behavior but also on a range of other interrelated outcomes specific to the transition from adolescence to adulthood. Focusing on this period during the life cycle is of specific policy relevance because of the emphasis on youth as a targeted HIV at-risk population throughout sub-Saharan Africa (Poulin and Watkins 2012).

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<sup>4</sup> The characteristics of Gong’s sample are different from those of the Malawi sample used by Delavande and Kohler and Thornton in several dimensions which could potentially explain the opposite results. Individuals in his sample are less likely to be married and reside in urban areas with higher HIV prevalence than the largely rural areas where the Malawi data was collected. Gong’s sample consists of people who were seeking HIV-related services, and not a random sample of the population. Two-third of the baseline sample attrite by follow-up six months later.

<sup>5</sup> Although the age ranges are almost the same between Baird et al (2013) and ours (women ages 13-22 and 14-21, respectively), there are notable differences. The women in their sample are more likely to be in school (75 percent compared to 43 percent) and less likely to be married (9 percent compared to 21 percent). Our sample is closer to national statistics from the DHS 2010. Ninety percent of young women in the Baird et al (2013) study report no chance of being infected with HIV, compared to 71 percent in our sample.



### *Setting and Data*

The potential for VCT to affect behaviors related to transition into adulthood is important when considering the social and economic environments facing young people in a poor country like Malawi. Education levels remain very low. According to the Malawi Demographic and Health Survey (DHS) from 2010, 16 percent of young men aged 25 to 29 had completed secondary school, and fewer than five percent had attended post-secondary school; among women in this age group, eight percent had completed secondary school and less than three percent had attended school beyond the secondary level (NSO and ICF Macro, 2011). Poverty remains high. There are few opportunities for non-farming employment and secondary education, age at first marriage remains young, and nearly everyone marries at least once. Median ages at first marriage for respondents age 25-49 are 17.8 for women and 22.5 for men.

Malawi has a generalized HIV epidemic; prevalence among 15-49 year old population is estimated to be 10.6 percent (NSO and ICF Macro, 2011) with a steep age gradient. The HIV prevalence among 15-17 year-old young women is 3.4 percent, while that of 18-19 year-olds is 5.7 percent. The prevalence is 1.3 percent among 15-19 year-old men, but increases to 4.6 percent among 23-24 year-olds and 6.9 percent for those 25-29. Prevalence rates among never-married women and men (our study sample at baseline) are about half of the rates among those ever married. Prevalence rates are much higher in urban Malawi than in rural areas like our study site.

This study uses data from the Marriage Transitions in Malawi (MTM) project, a panel survey conducted in 60 rural and semi-urban communities in the Salima district of central Malawi. The project was designed to understand socioeconomic patterns of young adults as they transition into adulthood and with an emphasis on HIV/AIDS. The connection between the two

is motivated largely by the search for a spouse. This search is associated with an assessment of potential partners, leading to changes in partners, or in unprotected sex to ensure the potential spouse is fertile (Clark, Poulin, and Kohler 2009; Poulin and Beegle 2011). In some countries in South and Eastern Africa, the rate of new infections rises during this search process (Magruder 2011; Glynn et al. 2003).

The study consists of 1,183 initially never-married young women and men and was designed to follow them into marriage.<sup>6</sup> Three annual household surveys were conducted (2007, 2008, 2009), with two Partnership Interview surveys conducted mid-way between the annual surveys.<sup>7</sup> The data contain detailed information on partnering behavior as well as socioeconomic conditions, including asset ownership and family background. Since this age group is highly mobile, the MTM study made additional efforts to track sample respondents who relocated after the baseline round in 2007 (Beegle and Poulin 2013). This is especially important since marriage itself often results in moving to a new village or town. Tracking proved important for ensuring re-contact rates; more than one-quarter of respondents moved during the course of the panel. For this analysis, we include respondents interviewed during all three annual household surveys. This sample consists of 1,009 respondents, 529 women and 480 men. In the 2008 round, a random sample of respondents was offered a HIV test.<sup>8</sup> Of the 1,009 respondents, 531 (53 percent) were randomly offered VCT. The test was administered by trained and certified VCT counselors in the privacy of each respondent's residence. The test result was offered

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<sup>6</sup> Sixty enumeration areas were randomly selected from a sample of 215 areas stratified by distance to main trading centers. The sampling frame for respondents within the enumeration areas was stratified by age for men and women. More information on the sample design is available at [sites.google.com/site/mtmalawiproject/mtmbackground](http://sites.google.com/site/mtmalawiproject/mtmbackground).

<sup>7</sup> In between the three main summer rounds 2007-2009, there was an interim survey round for a two-thirds of the sample randomly selected and then interviewed with a modified questionnaire. We do not use this round for this analysis for two reasons. First, the roughly 5-6 months between summer 2008 and the interim round in 2009 may be too short for the behavior changes we examine. Second, we want to examine results for the complete sample.

<sup>8</sup> Of the 174 respondents who are not in either round 2 or 3, three-quarters were not found and the rest refused to participate. The attriters have comparable socio-demographic characteristics as the tracked sample (results not reported).

immediately. Ninety-three percent of those offered a test consented to a test; of these, only five respondents opted to not learn their status.<sup>9</sup> There are only minimal differences between those who refused the test and those who accepted: men with no schooling were less likely to accept the test; women from wealthier households were more likely to accept the test. Both men and women who had been tested in the past were more likely to accept the offer of a test. Of those tested, less than one percent of the men (2 out of 237) and two percent of the women were HIV positive (4 out of 274).

In Table 1 we report sample characteristics at the 2008 round, by gender and by whether respondents were offered an HIV test. The results reflect the randomization process, whereby the principal investigators generated a random number program in Stata for selection. The variables are well-balanced across the control and treatment groups. Variable-by-variable individual tests reported in the table cannot reject that the means are the same for the two groups for almost all the variables.

Women in the sample range in age from 14 to 21 (by design), with a mean age of 17. Nearly all women have some schooling, and 32 percent have attended secondary school. At the time of the testing offer in 2008, 43 percent were still attending school. Fifty-nine percent of women reported ever having sex, and 44 percent reported having had sex in the 12 months prior to the 2008 interview. Fifteen percent reported ever being pregnant and 21 percent were married.

The average age of the men in the sample is 20, ranging from 14 to 26.<sup>10</sup> Thirty-one percent of men have attended at least some secondary school, and 62 percent have attended some primary school. Twenty-four percent of men were currently attending school. The lower

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<sup>9</sup> For comparison, Trinitapoli and Yeatman (2011) had testing rates of 80 percent for a sample of young adults in southern Malawi in 2009; acceptance rates were 80 percent. DHS 2010 had testing rates of about 90% for women and 83% for men (15-24). Baird et al (2013) tested 98% of their sample of adolescent women.

<sup>10</sup> Because of the later age of marriage for men, the MTM project purposefully aimed for the sample of young men to be older than that of young women.

percentage of men attending school reflects the older ages relative to the women. The men were also more likely than women to have ever had sex and to report being currently sexually active. Eighty-five percent report ever having sex and 59 percent report being sexually active. Sixteen percent of men reported ever having impregnated a woman. The same proportion of men were married. Because of the widespread availability of VCT in Malawi, it is not surprising that just under half of the sample had been tested prior to the testing offered by the MTM VCT team. Men were more likely to have been tested than women (53 percent versus 40 percent).

As discussed above, those tested (especially when recently tested) may respond differently to an additional test than those who have a test for the first time. Table 2 shows the traits of men and women in 2008 by their prior testing status. Those with a prior testing experience were on average older, had higher education, were more likely to be married, sexually active, and to have ever been pregnant. In each round, respondents reported the likelihood they assigned to being infected with HIV at the time of the interview. Respondents chose one of four categories: no likelihood, low likelihood, medium likelihood, and high likelihood. Table 3 shows the stated beliefs in 2008, just before the testing offer. The table reports the beliefs overall and by some specific traits. Generally this sample reported low levels of beliefs about their own infectivity; very few reported a medium or high likelihood that they are HIV infected, so that most fall within the “no likelihood” or “low likelihood” categories.<sup>11</sup> There are notable gender differences in the reporting of low likelihood. While 28 percent of young women assigned at least some likelihood to being infected, only eight percent of men reported the same. Some variation also exists across social and demographic groups. T-tests confirm that respondents were significantly more likely to assign at least some likelihood to

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<sup>11</sup> This distribution likely reflects the young age of the respondents although the same question posed to adults in rural Malawi yielded a similarly lopsided distribution, albeit with slightly greater percentages falling into the medium and high likelihood categories (Smith and Watkins 2005).

being infected if they ever had sex, were currently sexually active or were ever pregnant. Young women were more likely to assign no likelihood if they were attending school, and less likely to do so if they were married. Men were more likely to assign no likelihood to being infected if they had been tested for HIV before the interview. The analysis that follows examines the differential results of a test offer by these self-reported likelihoods.

### *Estimated Causal Effects*

To examine the impact of testing on subsequent behaviors, we study the intent-to-treat effect on six outcomes that capture key events experienced by young people in the transition from adolescence to adulthood. We focus on school attendance, marriage, fertility and sexual behaviors as measured in 2009, a year after the VCT offer. Specifically, the six outcome indicators used in the analysis are: (i) *Stay in school*<sup>12</sup>: an indicator for whether a respondent is attending school in 2009, conditional on being in school in 2008. Respondents who report the highest grade level of secondary school as the highest grade attended by 2008 are excluded<sup>13</sup>; (ii) *Got married*: married in 2009 conditional on having not being married in 2008; (iii) *First pregnancy*: pregnancy between 2008 and 2009 conditional on no pregnancy prior to the VCT intervention. For men, this is an indicator for ever impregnating a sexual partner; (iv) *Number of pregnancies*: cumulative number of pregnancies; for men, it includes pregnancies for all partners; (v) *Sexually active and not-yet-married*: reporting having had sex in the 12 months prior to the 2009 interview, excluding respondents who are married in 2008; (vi) *Multiple partners*: an indicator for reporting more than one sexual partner in the past year.

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<sup>12</sup> Re-entry into primary or secondary school after leaving is rarely observed, there we examine school enrollment conditional on being enrolled in the baseline.

<sup>13</sup> There are very high barriers to continuation from secondary to tertiary education in Malawi.

Given the random allocation of testing offers and the balance between the treatment and control groups, differences in outcomes' means between groups can be attributed to the VCT intervention and interpreted as intent-to-treat effects. Therefore, we present our results in terms of mean-comparison tests.<sup>14</sup>

As discussed above, the effect of learning one's HIV status may depend on the individual's beliefs about his/her own HIV status prior to the test offer. Similar to the empirical approaches employed by Boozer and Philipson (2000) and Gong (2012), we explore how the testing effect varies by these beliefs. We analyze separately the effects on the group that assigned no likelihood to being HIV-infected in 2008 from those on the group that assigned any likelihood. We combine the low, medium, and high likelihood categories because less than three percent of respondent chose the medium or high categories. We observe very few men who express any likelihood of being infected so we perform this sub-group analysis only for our sample of young women.

Table 4 Panel A presents results of the main specification for young women. Each column presents results for an estimation of one of the six outcomes of interest. We do not find a statistically significant effect of VCT on any of the outcomes. Moreover, the differences between the study groups are small in magnitude. These findings – a lack of impact of VCT – are similar to the outcomes for the sample of women in Baird (2013) (with the caveat in footnote 5 on sample comparability).

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<sup>14</sup> Age is highly correlated with most of the outcomes that we focus on. Therefore, although the average age in the treatment and control groups is overall balanced, the age composition of the groups might influence the results when we do the sub-group analysis or restrict the sample for some of our outcomes. To verify that this is not driving our results, we performed an additional analysis of the full set of results presented in the paper by regressions with age fixed effects. This analysis resulted in treatment effects that are similar to those presented here.

Table 4 Panel B presents results for young men.<sup>15</sup> As for the young women, we observe little response to the test offer. All the outcomes indicate a slower transition to adulthood among the group who received the VCT offer. However, for four out the six outcomes, the difference between the groups is not statistically significant. Men who are not married when tested are seven percentage points less likely to be married a year after receiving VCT offer. Men who have never fathered a child before getting tested are eight percentage points less likely to impregnate a woman in the following year. Both of these effects are significant at the 10 percent level. These findings, lack of significance for most outcomes, leads us to conclude there are negligible effects for young men.

There are several reasons why offering an HIV test for young people might have little or no impact on behaviors. In settings such as Malawi where testing is now common, a new test might only provide marginal information, reflecting only risk exposure since the previous test. In addition, young people have had short durations of exposure to risk of HIV infection. In our data, this is reflected in the results of the HIV tests: only a handful of respondents were found to be HIV-infected. It is also reflected in the low levels of likelihood which respondents assigned to being infected prior to taking the test. Consequently, it is likely that for many of the respondents learning their test results did not provide new information which would alter behaviors. Second, learning a negative test result, as most of our respondents did, provides information only about current HIV status. As these youth reside in a setting with a generalized epidemic, they might still perceive high risk of infection associated with different behaviors and high uncertainty for future status.

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<sup>15</sup> The sample sizes for the schooling outcomes conditional on 2008 enrollment are smaller since the sample of men are older and, therefore, less likely overall to be in school in 2008.

Table 5 presents the results of our second specification, interacting testing with prior beliefs for young women. This is an ex-post analysis, as the randomization was not designed in regards to prior beliefs. We find that reported likelihood of being HIV positive does not change the results above. For those who assigned at least some likelihood to being infected with HIV, only one of the six outcomes is significant at the 10 percent level: the testing offer resulted in a decrease of 13 percentage points of transitioning into marriage for those who were not married in 2008 when they reported a likelihood of being positive. Among those who report no likelihood to being infected, we find that a test offer yields a positive effect on remaining in school in subsequent rounds (significant at the 10 percent level). Yet we find no significant effect on the fertility and sexual behaviors, regardless of the level of prior beliefs. We conclude that there is basically no impact of testing for those who reported any likelihood (mostly low) of being infected or for those who reported no likelihood.

### ***Wealth Effects***

Wealth is closely linked with the behaviors considered in this paper. Wealth can determine which choices are available to young men and women. Paying secondary school fees, for example, might not be feasible for poor households. Wealth can also affect the relative valuation of different choices. Consider a woman's decision to marry and leave the household. The higher the level of consumption she receives in her current household, the less attractive any marital offer is. In addition, wealth can affect perceptions about opportunities and well-being in the future. This might influence choices that involve tradeoffs between current and future utilities. For instance, a young person's decision of whether to engage in risky sex might be influenced by his or her present valuation of expected utility flows in the future.



Our data show that household wealth and the outcomes of interest for this paper are strongly correlated. In Table 6 we report results for different outcomes measured in the 2009 round on respondents' age and an indicator for household wealth above the median in the baseline survey. Household wealth is defined by an asset index using principle component analysis. Wealth is associated with a slower transition to adulthood. Relative to their poorer counterparts, young men and women of higher wealth are significantly more likely to report attending school in the endline survey. They are also less likely to be married, to ever be pregnant or to report ever having sex. The wealthier young women are also less likely to report being sexually active.

These trends observed in our data are consistent with findings in other studies. In a similar setting in southern Malawi, cash transfers that increase income have been shown to significantly delay school exit, marriage and fertility onset of young women in Malawi and to reduce prevalence of sexually transmitted diseases (Baird, McIntosh, and Özler 2012, Baird et al. 2012). In addition, several studies suggest that variation in income is linked to engaging in transactional sex -- sexual relationships motivated by material support to the female partner from the man (e.g. Burke, Gong and Jones 2012, Kohler and Thornton 2012 and Robinson and Yeh 2011).

Given this background, we could expect that one's response to VCT may differ depending on household wealth. To that end, we complement our study with an ex-post analysis of heterogeneous effects of testing by household's wealth. The original randomization in the test offer was a simple randomization with no regard to wealth status at baseline.

To explore heterogeneity in response to testing by household's wealth, we perform the mean-comparison tests separately for individuals whose household wealth index in the baseline

is below and above the median. Finally, we also explore heterogeneity in response to testing by both wealth and prior beliefs. When splitting the sample by both wealth and prior belief categories, we note that there are smaller cell sizes and less power to detect impacts.

In Table 7, we present the effects of VCT on the two wealth groups. Overall, we find negligible effects for young women. Among those from poorer households who were attending school in 2008, the likelihood of attending school in 2009 increases by 19 percentage points after receiving a VCT offer. This effect is statistically significant at the 10 percent level. The coefficients for the marital and fertility outcomes are negative but not statistically significant. The effects of the testing offer on none of the outcomes for young women of higher wealth are statistically significant.

Table 8 presents the results of a test offer across four groups of young women: women of lower wealth and some likelihood reported, women of lower wealth who assign no likelihood to being infected, women of higher wealth who assign some likelihood, and women of higher wealth who assign no likelihood. Among women who are poorer and report some likelihood of being infected, the test offer reduces the likelihood of getting married by 30 percentage points. The likelihood of having ever been pregnant a year after the test also reduces by 32 percentage points. Both of these effects are significant at the five percent level. Among the richer young women who assign some likelihood of being infected, one test out of six appears significant at the 10 percent level. Those who were never pregnant by the time of the VCT offer were 20 percentage points *more* likely to ever be pregnant a year later. The test offer does not affect these outcomes for those who assign no likelihood to being infected regardless of wealth status.

Table 7 Panel B presents results for the model interacting the test offer with household's wealth for young men. We observe more impacts of testing for wealthier men, but not across all

outcomes. The testing offer has statistically significant effects on marital and fertility outcomes for young men of higher wealth. For these men, a test offer results in a 10 percentage point decrease in the likelihood of getting married conditional on not being married at the time of the test. In addition, the testing offer resulted in a decrease of 12 percentage points in the likelihood of ever impregnating a sexual partner and a reduction of 0.14 in the total number of pregnancies. Additional analysis of wealth quartiles (more flexibility but smaller cells) shows these impacts are concentrated among the wealthiest quartile. The VCT offer did not result in a statistically significant effect on any outcome for the poorer young men – results are both statistically insignificant and small in size.

### *Discussion*

The international community concerned with the AIDS epidemic in Africa views HIV testing as a critical policy prescription needed to combat the disease. This view has led to a huge investment in making HIV tests widely accessible in most African countries. Testing people is a critical entry point into treatment, which can lower infectiousness and, thus, serve to mitigate the spread of the disease. But testing and the counseling that accompanies it are also supported as a means to impact behaviors to reduce transmission rates. It is this latter relationship we study here. We explore the response to HIV testing on sexual behavior and the timing of important life events among young people in Malawi. By looking at a random sample of men and women, we contribute to a small, but growing body of studies which randomize testing and explore behavior change in response to VCT.

We find little response to an HIV test among our outcomes. We see no impact of the VCT intervention on any of the behaviors by young women. The results for men suggest some

slowdown in the transition towards adulthood in response to the VCT intervention as measured by marriage and impregnating a sexual partner. Despite a generalized epidemic, these results are consistent with the high rates of prior testing, the low rates of infectivity among young adults, and the low levels of reported likelihood of infection – characteristics of many settings in sub-Saharan Africa where testing is touted as a means to change behaviors. The majority of young men and women report there is no or little chance they are infected. As such, a test does not offer new information, although it does provide confirmation about one's prior beliefs.

We do look for heterogeneity in response to a test through a set of ex-post analysis looking at prior beliefs and wealth. These are ex-post in the sense that the original study was a randomization without regard to these traits. The wealth effects differ for women and men. The poorer young women, who assigned some likelihood to being infected prior to receiving the VCT offer, are less likely to transition into marriage or fertility a year after the intervention. Among the young men, it is the wealthier ones that are less likely to be married or to father children a year after the VCT offer. This heterogeneity by socioeconomic status can result from the different set of opportunities richer and poorer young adults face and the different expectations they have about the future. It could also be that testing influences decisions similarly but because of the different propensities to engage in the different behaviors, independent of testing, we can only observe significant changes in behaviors for some groups.

## ***References***

Angotti, Nicole, Kim Yi Dionne, and Lauren Gaydos. 2011. "An Offer You Can't Refuse? Provider-Initiated HIV Testing in Antenatal Clinics in Rural Malawi." *Health Policy and Planning* 26(4): 307-315.

Angotti, Nicole. 2010. "Working Outside the Box: How HIV Counselors in sub-Saharan Africa Adapt Western Testing Norms." *Social Science and Medicine* 71(5): 986-993.

Baird, Sarah, Erick Gong, Craig McIntosh, Berk Özler. 2013. "The Heterogeneous Effects of HIV Testing." Mimeo.

Baird, Sarah J., Richard S. Garfein, Craig T. McIntosh, and Berk Özler. 2012. "Effect of a cash transfer programme for schooling on prevalence of HIV and herpes simplex type 2 in Malawi: a cluster randomised trial." *The Lancet* 379 (9823): 1320-1329.

Baird, Sarah, Craig McIntosh, and Berk Özler. 2011. "Cash or Condition? Evidence from a Cash Transfer Experiment." *The Quarterly Journal of Economics* 126 (4): 1709-1753.

Beegle, Kathleen and Michelle Poulin. 2013. "Migration and the Transition to Adulthood in Contemporary Malawi." *The ANNALS of the American Academy of Political and Social Science*, 648(1): 38-51.

- Boozer, Michael and Tomas Philipson. 2000. "The Impact of Public Testing for Human Immunodeficiency Virus." *Journal of Human Resources* 35 (3): 419-446.
- Burke, Marshall, Erick Gong, and Kelly Jones 2013. "Income Shocks and HIV in Africa." Mimeo
- Cole, Jennifer. 2004. "Fresh contact in Tamatave, Madagascar: Sex, money, and intergenerational transformation." *American Ethnologist* 31(4): 573-588.
- Clark, Shelley, Michelle Poulin, and Hans-Peter Kohler. 2009. "Marriage Aspirations and HIV/AIDS in Rural Malawi." *Journal of Marriage and the Family* 71: 396-416.
- de Paula, Aureo, Gil Shapira, and Petra Todd. Forthcoming. "How Beliefs about HIV Status Affect Risky Behaviors: Evidence from Malawi." *Journal of Applied Econometrics*.
- Delavande, Adeline and Hans-Peter Kohler. 2012. "The Impact of HIV Testing on Subjective Expectations and Risky Behaviors in Malawi." *Demography* 49(3): 1011-36.
- Duflo, Esther , Pascaline Dupas, and Michael Kremer. 2011. "Education, HIV and Early Fertility: Experimental Evidence from Kenya." Mimeo.
- Gersovitz, Mark. 2011. "HIV Testing: Principles and Practice." *World Bank Research Observer* 26(1): 1-41.

Glynn, Judith R., Michel Caraël, Anne Buvé, Rosemary M. Musonda, Maina Kahindo, and The Study Group on the Heterogeneity of HIV Epidemics in African Cities. 2003. "HIV Risk in Relation to Marriage in Areas with High Prevalence of HIV Infection." *Journal of Acquired Immune Deficiency Syndromes* 33(4): 526-535.

Gong, Erick. 2012. "HIV Testing & Risky Sexual Behavior." Middlebury Economics Working Paper 11-01. Forthcoming *The Economic Journal*.

Government of Malawi. 2003. "National HIV/AIDS Policy: A Call to Action."

Hunter, Mark. 2010. *Love in the Time of AIDS: Inequality, Gender, and Rights in South Africa*. Indiana University Press: Bloomington.

Kohler, Hans-Peter and Rebecca L. Thornton. 2012. "Conditional Cash Transfers and HIV/AIDS Prevention: Unconditionally Promising?" *World Bank Economic Review* 26(2): 165-190.

Magruder, Jeremy. 2011. "Marital Shopping and Epidemic AIDS." *Demography* 14(4):1401-1428.

National Statistical Office (NSO) and ICF Macro. 2011. *Malawi Demographic and Health Survey 2010*. Zomba, Malawi, and Calverton, Maryland, USA: NSO and ICF Macro.

Parikh, Shanti. 2009. "Going Public: Modern Wives, Men's Infidelity and Marriage in East-Central Uganda. In *The Secret: Love, Marriage, and HIV*, by Jennifer S. Hirsch, Holly Wardlow, Daniel Jordan Smith, Harriet M. Phinney, Shanti Parikh, and Constance A. Nathanson. Vanderbilt University Press: Nashville. pps. 168-196.

Potts, Malcolm, Daniel T. Halperin, Douglas Kirby, Ann Swidler, Elliot Marseille, Jeffrey D. Klausner, Norman Hearst, Richard G. Wamai, James G. Kahn, Julia Walsh. 2008. "Reassessing HIV Prevention." *Science* 320: 749-750.

Poulin, Michelle. 2007. "Sex, Money, and Premarital Partnerships in Southern Malawi." *Social Science & Medicine* 65(11): 2383-2393.

Poulin, Michelle and Kathleen Beegle. 2011. "Out-of-Wedlock Fertility and the Timing of First Marriage in Malawi." Mimeo.

Poulin, Michelle and Susan Watkins. 2012. "The Case of the Missing Men with Money." Mimeo.

Robinson, James and Ethan Yeh. 2011. "Transactional Sex as a Response to Risk in Western Kenya." *American Economic Journal: Applied Economics* 3(1):35-64.



Smith, Kirsten P. and Susan Cotts Watkins. 2005. "Perceptions of Risk and Strategies for Prevention: Responses to HIV/AIDS in Rural Malawi." *Social Science & Medicine* 60(3): 649-660.

Thornton, Rebecca. 2008. "The Demand for and Impact of Learning HIV Status: Evidence from a Field Experiment." *American Economic Review* 98(5): 1829–1863.

Trinitapoli, Jenny and Sara Yeatman. 2011. "Uncertainty and Fertility in a Generalized AIDS Epidemic." *American Sociological Review* 76(6): 935-954.

UNAIDS. 2006. "AIDS Epidemic Update: Special Report on HIV/AIDS: December 2006".  
UNAIDS, Geneva.

Watkins, Susan. 2004. "Navigating the AIDS Epidemic in Rural Malawi." *Population and Development Review* 30(4): 673-705.

**Table 1: Sample Characteristics by Gender and Treatment**

	<u>Young Women</u>				<u>Young Men</u>			
	All (N=529)	Control (N= 233)	Treatment (N=296)	Diff. (T-test)	All (N=480)	Control (N= 245)	Treatment (N=235)	Diff (T-test)
<b>Age</b>	16.68 (1.63)	16.72 (1.68)	16.65 (1.59)	0.07 (0.14)	20.34 (1.83)	20.47 (1.92)	20.21 (1.74)	0.26 (0.17)
<b>Schooling</b>								
None	0.02	0.02	0.01	0.01	0.03	0.04	0.03	0.004
Primary	0.66	0.69	0.64	0.06	0.62	0.62	0.63	-0.01
Secondary	0.32	0.28	0.35	-0.07	0.31	0.29	0.33	-0.03
<b>Tribe</b>								
Chewa	0.63	0.63	0.63	-0.01	0.65	0.67	0.63	0.04
Yao	0.19	0.18	0.20	-0.01	0.19	0.19	0.19	0.001
Ngoni	0.09	0.10	0.09	0.01	0.08	0.08	0.08	-0.004
<b>Wealth</b>								
2 <sup>nd</sup> Quartile	0.24	0.27	0.22	0.05	0.27	0.26	0.28	-0.02
3 <sup>rd</sup> Quartile	0.26	0.26	0.27	-0.01	0.25	0.24	0.26	-0.02
4 <sup>th</sup> Quartile	0.24	0.22	0.26	-0.05	0.22	0.24	0.21	0.03
<b>Married</b>	0.21	0.21	0.20	0.01	0.16	0.15	0.17	-0.02
<b>In School</b>	0.43	0.42	0.44	-0.02	0.24	0.22	0.26	-0.03
<b>Sexually Active</b>	0.44	0.47	0.42	0.05	0.59	0.61	0.58	0.03
<b>Ever Had Sex</b>	0.59	0.62	0.57	0.05	0.85	0.88	0.82	0.06*
<b>Ever Pregnant</b>	0.15	0.16	0.14	0.02	0.16	0.14	0.19	-0.04
<b>Tested Before</b>	0.40	0.45	0.37	0.09	0.53	0.52	0.53	-0.01
<b>Reports no likelihood of being infected</b>	0.71	0.71	0.71	0.00	0.92	0.95	0.90	0.05**

Outcomes in MTM 2008 round. With exception of age, all covariates are binary indicators. \*significant at 10% level, \*\* significant at 5% level. Standard deviations are in parentheses. Treatment refers to being offered a test. Control indicates no test offer.

**Table 2: Sample Characteristics by Testing Prior to 2008 Round**

	<u>Young Women</u>			<u>Young Men</u>		
	Not Tested (N=316)	Tested (N=213)	Diff. (T-test)	Not Tested (N=228)	Tested (N=252)	Diff. (T-test)
<b>Age</b>	17.35	18.16	-0.82***	21.09	21.56	-0.47***
<b>Schooling</b>						
<b>Primary</b>	0.71	0.58	0.13***	0.69	0.56	0.13***
<b>Secondary</b>	0.27	0.39	-0.12***	0.26	0.36	-0.10**
<b>Tribe</b>						
<b>Chewa</b>	0.63	0.63	0.00	0.68	0.62	0.06
<b>Yao</b>	0.21	0.17	0.04	0.17	0.2	-0.03
<b>Ngoni</b>	0.08	0.12	-0.04	0.07	0.08	-0.01
<b>Wealth</b>						
<b>2<sup>nd</sup> Quart.</b>	0.25	0.22	0.03	0.28	0.26	0.02
<b>3<sup>rd</sup> Quart.</b>	0.25	0.29	-0.04	0.26	0.25	0.01
<b>4<sup>th</sup> Quart.</b>	0.22	0.27	-0.04	0.18	0.26	-0.08**
<b>In School</b>	0.50	0.33	0.17***	0.25	0.23	0.01
<b>Married</b>	0.12	0.33	-0.21***	0.11	0.19	-0.08**
<b>Sexually Active</b>	0.33	0.6	-0.27***	0.54	0.64	-0.10**
<b>Ever Had Sex</b>	0.48	0.75	-0.27***	0.83	0.86	-0.03
<b>Ever Pregnant</b>	0.04	0.30	-0.26***	0.11	0.22	-0.11***

Outcomes in MTM 2008 round. \*significant at 10% level, \*\* significant at 5% level, \*\*\* significant at 1% level

**Table 3: Likelihood of Being HIV-Infected in 2008**

	<u>Young Women</u>				<u>Young Men</u>			
	No	Low	Medium	High	No	Low	Medium	High
<b>All</b>	0.71	0.25	0.02	0.01	0.92	0.05	0.02	0.00
<b>Schooling</b>								
<b>Primary</b>	0.72	0.25	0.02	0.01	0.92	0.05	0.03	0.00
<b>Secondary</b>	0.70	0.27	0.02	0.01	0.95	0.05	0.00	0.00
<b>Tribe</b>								
<b>Chewa</b>	0.73	0.25	0.02	0.00	0.92	0.06	0.02	0.00
<b>Yao</b>	0.71	0.28	0.00	0.01	0.94	0.01	0.02	0.02
<b>Wealth</b>								
<b>2<sup>nd</sup> Quart.</b>	0.74	0.26	0.01	0.00	0.89	0.09	0.02	0.01
<b>3<sup>rd</sup> Quart.</b>	0.74	0.23	0.03	0.00	0.98	0.02	0.01	0.00
<b>4<sup>th</sup> Quart.</b>	0.67	0.31	0.02	0.01	0.90	0.08	0.03	0.00
<b>In School</b>	0.78	0.21	0.00	0.01	0.94	0.05	0.01	0.00
<b>Married</b>	0.63	0.34	0.02	0.01	0.92	0.05	0.01	0.01
<b>Sexually Active</b>	0.64	0.32	0.03	0.01	0.89	0.08	0.02	0.01
<b>Ever Had Sex</b>	0.65	0.31	0.03	0.01	0.91	0.06	0.02	0.00
<b>Ever Pregnant</b>	0.62	0.33	0.05	0.00	0.86	0.08	0.04	0.03
<b>Tested Before</b>	0.68	0.28	0.03	0.01	0.94	0.03	0.02	0.01

Note: The table reports the share of respondents for each trait by the 4 categories to the question “In your opinion, what is the likelihood (chance) that you are infected with HIV/AIDS now?”

**Table 4: Effect of VCT on Outcomes in 2009**

<b>Panel A: Young Women</b>						
	<b>Stay in School<sup>(a)</sup></b>	<b>Got Married<sup>(b)</sup></b>	<b>First Pregn.<sup>(c)</sup></b>	<b>Num. of Preg.</b>	<b>Sexually Active<sup>(d)</sup></b>	<b>Multiple Partners<sup>(e)</sup></b>
Control	0.624	0.234	0.379	0.502	0.402	0.009
Test Offer	0.723	0.191	0.341	0.446	0.447	0.024
Difference	-0.099	0.043	0.038	0.056	-0.045	-0.015
	(0.065)	(0.040)	(0.046)	(0.053)	(0.049)	(0.011)
<b>Sample Size</b>						
Control	93	184	195	233	184	233
Test Offer	119	236	255	296	235	296

  

<b>Panel B: Young Men</b>						
	<b>Stay in School<sup>(a)</sup></b>	<b>Got Married<sup>(b)</sup></b>	<b>First Pregn.<sup>(c)</sup></b>	<b>Num. of Preg.</b>	<b>Sexually Active<sup>(d)</sup></b>	<b>Multiple Partners<sup>(e)</sup></b>
Control	0.683	0.181	0.290	0.434	0.575	0.142
Test Offer	0.731	0.113	0.213	0.386	0.521	0.094
Difference	-0.048	0.068*	0.078*	0.048	0.054	0.047
	(0.096)	(0.035)	(0.043)	(0.057)	(0.050)	(0.029)
<b>Sample Size</b>						
Control	41	193	193	226	193	226
Test Offer	52	212	207	254	211	254

Mean outcomes as measured in the 2009 round.

<sup>(a)</sup> Excluding respondent in the eighth year of primary school and fourth year of secondary school.

<sup>(b)</sup> Conditional on not being married in the 2008 round.

<sup>(c)</sup> Conditional on no pregnancies by the 2008 round.

<sup>(d)</sup> Reports having sex in the 12 months prior to interview, excluding respondent who report being married in 2008

<sup>(e)</sup> Reports more than one sexual partner in the 12 months prior to interview.

Standard errors of the difference in means is in parentheses.\*significant at 10% level, \*\* significant at 5% level, \*\*\* significant at 1% level

**Table 5: Effect of VCT by Prior Beliefs, Young Women**

		<b>Stay in School<sup>(a)</sup></b>	<b>Got Married<sup>(b)</sup></b>	<b>First Pregn.<sup>(c)</sup></b>	<b>Num. of Preg.</b>	<b>Sexually Active<sup>(d)</sup></b>	<b>Multiple Partners<sup>(e)</sup></b>
<b>Likelihood<sup>(f)</sup></b>	Control	0.706	0.292	0.463	0.591	0.542	0
	Test Offer	0.643	0.159	0.418	0.588	0.516	0.012
	Difference	0.063 (0.148)	0.133* (0.079)	0.045 (0.091)	0.003 (0.101)	0.026 (0.097)	-0.012 (0.013)
<b>No Likelihood<sup>(f)</sup></b>	Control	0.605	0.215	0.348	0.464	0.356	0.012
	Test Offer	0.747	0.202	0.314	0.389	0.422	0.028
	Difference	-0.142* (0.072)	0.013 (0.047)	0.034 (0.052)	0.075 (0.061)	-0.066 (0.056)	-0.016 (0.015)
<b>Sample Size</b>							
<b>Likelihood<sup>(f)</sup></b>	Control	17	65	54	66	65	66
	Test Offer	28	98	67	85	98	85
<b>No Likelihood<sup>(f)</sup></b>	Control	76	65	141	166	65	166
	Test Offer	91	98	188	211	98	211

Mean outcomes as measured in the 2009 round.

<sup>(a)</sup> Excluding respondent in the eighth year of primary school and fourth year of secondary school.

<sup>(b)</sup> Conditional on not being married in the 2008 round.

<sup>(c)</sup> Conditional on no pregnancies by the 2008 round.

<sup>(d)</sup> Reports having sex in the 12 months prior to interview, excluding respondent who report being married in 2008

<sup>(e)</sup> Reports more than one sexual partner in the 12 months prior to interview.

<sup>(f)</sup> 'Likelihood' represents whether respondent assigned any likelihood to being infected with HIV in the 2008 round. Standard errors of the difference in means is in parentheses.\*significant at 10% level, \*\* significant at 5% level, \*\*\* significant at 1% level

**Table 6: Correlation between Wealth and Transition Behavior**

<b>Panel A: Young Women</b>							
	<b>In School</b>	<b>Married</b>	<b>Ever Pregnant</b>	<b>Num. of Preg.</b>	<b>Sexually Active<sup>(a)</sup></b>	<b>Multiple Partners<sup>(b)</sup></b>	<b>Ever Had Sex</b>
<b>High Wealth<sup>(c)</sup></b>	0.254*** (0.038)	-0.22*** (0.041)	-0.134*** (0.042)	-0.17*** (0.052)	-0.14*** (0.043)	0.003 (0.011)	-0.13*** (0.039)
<b>Age</b>	-0.06*** (0.012)	0.032** (0.013)	0.052*** (0.013)	0.062*** (0.016)	0.028** (0.013)	0.002 (0.004)	0.038*** (0.012)
<b>N</b>	524	524	524	524	523	524	524
<b>R<sup>2</sup></b>	0.114	0.062	0.044	0.044	0.025	0.001	0.035

<b>Panel B: Young Men</b>							
	<b>In School</b>	<b>Married</b>	<b>Ever Pregnant</b>	<b>Num. of Preg.</b>	<b>Sexually Active<sup>(a)</sup></b>	<b>Multiple Partners<sup>(b)</sup></b>	<b>Ever Had Sex</b>
<b>High Wealth<sup>(c)</sup></b>	0.119*** (0.033)	-0.12*** (0.040)	-0.156*** (0.042)	-0.24*** (0.054)	-0.082* (0.045)	-0.027 (0.030)	-0.06*** (0.024)
<b>Age</b>	-0.05*** (0.009)	0.048*** (0.011)	0.055*** (0.012)	0.063*** (0.015)	0.028** (0.012)	-0.011 (0.008)	0.024*** (0.007)
<b>N</b>	472	472	472	472	471	472	472
<b>R<sup>2</sup></b>	0.095	0.057	0.071	0.073	0.018	0.006	0.041

Mean outcomes as measured in the 2009 round.

<sup>(a)</sup> Reports having sex in the 12 months prior to interview, excluding respondents who report being married in 2008.

<sup>(b)</sup> Reports more than one sexual partner in the 12 months prior to interview.

<sup>(c)</sup> 'High Wealth' indicates that household wealth index in 2007 is above median.

Standard errors of the difference in means is in parentheses. \*significant at 10% level, \*\* significant at 5% level, \*\*\* significant at 1% level

**Table 7: Effect of VCT by Wealth**

		<b>Panel A: Young Women</b>					
		<b>Stay in School<sup>(a)</sup></b>	<b>Got Married<sup>(b)</sup></b>	<b>First Pregn.<sup>(c)</sup></b>	<b>Num. of Preg.</b>	<b>Sexually Active<sup>(d)</sup></b>	<b>Multiple Partners<sup>(e)</sup></b>
<b>Low Wealth<sup>(f)</sup></b>	Control	0.457	0.326	0.475	0.590	0.477	0.008
	Test Offer	0.644	0.265	0.400	0.518	0.461	0.022
	Difference	-0.187*	0.061	0.075	0.072	0.016	-0.014
		(0.111)	(0.067)	(0.068)	(0.078)	(0.073)	(0.015)
<b>High Wealth<sup>(f)</sup></b>	Control	0.724	0.155	0.280	0.410	0.340	0.009
	Test Offer	0.767	0.138	0.301	0.394	0.442	0.026
	Difference	-0.043	0.016	-0.022	0.016	-0.102	-0.017
		(0.077)	(0.047)	(0.061)	(0.070)	(0.066)	(0.017)
<b>Sample Size</b>							
<b>Low Wealth<sup>(f)</sup></b>	Control	35	86	101	122	86	122
	Test Offer	45	102	115	137	102	137
<b>High Wealth<sup>(f)</sup></b>	Control	58	97	93	110	97	110
	Test Offer	73	130	136	155	129	155

  

		<b>Panel B: Young Men</b>					
		<b>Stay in School<sup>(a)</sup></b>	<b>Got Married<sup>(b)</sup></b>	<b>First Pregn.<sup>(c)</sup></b>	<b>Num. of Preg.</b>	<b>Sexually Active<sup>(d)</sup></b>	<b>Multiple Partners<sup>(e)</sup></b>
<b>Low Wealth<sup>(f)</sup></b>	Control	0.765	0.196	0.337	0.509	0.588	0.155
	Test Offer	0.733	0.175	0.320	0.534	0.563	0.107
	Difference	0.031	0.021	0.017	-0.026	0.026	0.048
		(0.158)	(0.055)	(0.067)	(0.088)	(0.071)	(0.043)
<b>High Wealth<sup>(f)</sup></b>	Control	0.609	0.167	0.242	0.358	0.556	0.119
	Test Offer	0.735	0.064	0.124	0.216	0.486	0.086
	Difference	-0.127	0.102**	0.118**	0.142**	0.060	0.033
		(0.127)	(0.044)	(0.054)	(0.065)	(0.071)	(0.020)
<b>Sample Size</b>							
<b>Low Wealth<sup>(f)</sup></b>	Control	17	102	101	116	102	116
	Test Offer	15	97	97	131	96	131
<b>High Wealth<sup>(f)</sup></b>	Control	23	90	91	109	90	109
	Test Offer	34	109	105	116	109	116

Mean outcomes as measured in the 2009 round.

<sup>(a)</sup> Excluding respondent in the eighth year of primary school and fourth year of secondary school.

<sup>(b)</sup> Conditional on not being married in the 2008 round.

<sup>(c)</sup> Conditional on no pregnancies by the 2008 round.

<sup>(d)</sup> Reports having sex in the 12 months prior to interview, excluding respondent who report being married in 2008

<sup>(e)</sup> Reports more than one sexual partner in the 12 months prior to interview.

<sup>(f)</sup> 'High (Low) Wealth' indicates that household wealth index in 2007 is above (below) median.

Standard errors of the difference in means is in parentheses. \*significant at 10% level, \*\* significant at 5% level,

\*\*\* significant at 1% level



**Table 8: Effect of VCT by Prior Beliefs and Wealth, Young Women**

		<b>Stay in School<sup>(a)</sup></b>	<b>Got Married<sup>(b)</sup></b>	<b>First Pregn.<sup>(c)</sup></b>	<b>Num. of Preg.</b>	<b>Sexually Active<sup>(d)</sup></b>	<b>Multiple Partners<sup>(e)</sup></b>
<b>Low Wealth/ Likelihood<sup>(e)</sup></b>	Control	0.667	0.471	0.708	0.833	0.647	0
	Test Offer	0.667	0.172	0.387	0.61	0.414	0
	Difference	0 (0.327)	0.299** (0.133)	0.321** (0.131)	0.223 (0.147)	0.233 (0.152)	0
<b>High Wealth/ Likelihood<sup>(e)</sup></b>	Control	0.714	0.194	0.267	0.389	0.484	0
	Test Offer	0.6	0.156	0.471	0.595	0.613	0.024
	Difference	0.114 (0.182)	0.037 (0.097)	-0.204* (0.120)	-0.206 (0.135)	-0.129 (0.127)	-0.024 (0.026)
<b>Low Wealth/No Likelihood<sup>(e)</sup></b>	Control	0.438	0.29	0.403	0.511	0.435	0.011
	Test Offer	0.636	0.301	0.405	0.479	0.479	0.031
	Difference	-0.198 (0.123)	-0.011 (0.077)	-0.002 (0.078)	0.032 (0.091)	-0.044 (0.084)	-0.02 (0.021)
<b>High Wealth/No Likelihood<sup>(e)</sup></b>	Control	0.727	0.138	0.286	0.411	0.277	0.014
	Test Offer	0.81	0.133	0.245	0.319	0.388	0.027
	Difference	-0.083 (0.084)	0.006 (0.055)	0.041 (0.071)	0.092 (0.081)	-0.111 (0.076)	-0.013 (0.022)
<b>Sample Size</b>							
<b>Low Wealth/ Likelihood<sup>(f)</sup></b>	Control	3	17	24	30	17	30
	Test Offer	12	29	31	41	29	41
<b>High Wealth/No Likelihood<sup>(f)</sup></b>	Control	14	31	30	36	31	36
	Test Offer	15	32	34	42	31	42
<b>Low Wealth/No Likelihood<sup>(f)</sup></b>	Control	32	69	77	92	69	92
	Test Offer	33	73	84	96	73	96
<b>High Wealth/No Likelihood<sup>(f)</sup></b>	Control	44	65	63	73	65	73
	Test Offer	58	98	102	113	98	113

Mean outcomes as measured in the 2009 round.

<sup>(a)</sup> Excluding respondent in the fourth year of secondary school.

<sup>(b)</sup> Conditional on not being married in the 2008 round.

<sup>(c)</sup> Conditional on no pregnancies by the 2008 round.

<sup>(d)</sup> Reports having sex in the 12 months prior to interview, excluding respondent who report being married in 2008

<sup>(e)</sup> Reports more than one sexual partner in the 12 months prior to interview.

<sup>(f)</sup> 'Likelihood' represents whether respondent assigned any likelihood to being infected with HIV in the 2008 round.

'High (Low) Wealth' indicates that household wealth index in 2007 is above (below) median.

Standard errors of the difference in means is in parentheses. \*significant at 10% level, \*\* significant at 5% level,

\*\*\* significant at 1% level