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Inspiring women: Experimental evidence on sharing entrepreneurial skills in Uganda

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Inspiring women: Experimental evidence on sharing entrepreneurial skills in Uganda*

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Abstract

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1. Introduction

On foot of the 2030 Agenda for Sustainable Development, which aims to *leave no one behind*, development programs will increasingly target the most vulnerable and marginalized groups. People living with HIV, in particular women, are one of those groups. With widespread access to antiretroviral (ARV) treatment across the developing world, individuals living with HIV have the opportunity to live full and active lives. Yet, women are often excluded from fully participating in society due to significant social stigma (Canning, 2006). How to inspire behavioral change among marginalized groups has become a focus of recent development programs. The 2015 World Development Report (World Bank, 2015) has as a main theme *Mind, Society and Behavior*, in an effort to investigate how the understanding of human thinking can improve the design of development policies. One potentially effective approach, for which there is an emerging body of evidence, is the use of media and entertainment, and in particular role models, to inspire preference change and attitudes.

In this paper, we explore whether vulnerable groups can be inspired to realize their capabilities and improve their economic situation. Using a randomized controlled trial we examine whether role models and bottom-up knowledge sharing impact on the way in which discriminated individuals behave. The aim of the intervention is to affect how discriminated individuals see themselves and their beliefs about what they can achieve and as a consequence, the amount of effort they are willing to exert in their daily life.

Participants in the project were randomly selected among HIV-positive women attending health clinics in rural Uganda. Randomization into treatment took place at clinic level and randomization inference procedures are applied in the analysis to account for the number of clusters. Patients in treated clinics were invited to the screening of four videos (over the course of a year) of inspiring HIV-positive women, who run successful enterprises. A three-minute video was shown for each

round of intervention at three-month intervals, each featuring an inspiring woman, who describes her story from discovering that she is HIV positive to the challenges and rewards from setting up her own business. The four videos follow a similar plot, although they highlight different aspects of the challenges and goals of the four inspiring women. The first video and the last one are more inspirational in that the women are very charismatic, while the second one stresses the importance of children's education to her as the driving force behind her entrepreneurial activities. The third video highlights more the entrepreneurial and strategic business aspects of starting an enterprise. Each video ends with a final message, similar across the four videos, which aims to communicate strongly to viewers that success is possible for them too. A group discussion took place during and after the video screening, which was led by one of the authors. A set of posters featuring the inspiring women was affixed in each treated clinic at the end of the screening.

We provide evidence that viewing the videos increases the probability of starting a business by 13.8 percentage points. Exposure to the role models also leads to an increase in income from crops and livestock, and enterprise income one year after the start of the intervention. On average, women in the treatment group experience a staggering increase in income of 158 per cent. Moreover, the videos are found to lead to better health among women and their children and a lower proportion of children absent from school. This is likely due to a combination of higher incomes and a direct effect through some of the messages contained in the videos regarding female health and the schooling of children. Finally, women in the treatment group save more: savings of participants exposed to the videos are 136 per cent higher than savings of individuals in the control group after the intervention. These findings suggest that this simple, cost effective and easily scalable intervention could have long-term effects. Our results show that providing vulnerable women with role models that empower them to start their own enterprise activities may be very effective in improving welfare outcomes.

We explore two potential mechanisms. First, the role models are providing inspiration, which empowers women to change their actions. Second, the role models perform a training function, as participants act upon the information provided in the videos. We find evidence for both mechanisms. In relation to the former, we find that women exercise more control over their personal resources suggesting that the role models are empowering for women, not only leading them to earn higher incomes, but also leading them to have more control over what that income is spent on. In relation to the latter, the new businesses started by the women are similar to those of the role models and are in line with the sequencing of the screening of the videos, hence supporting the training function of the videos.

Our paper contributes to the emerging literature that examines the use of media and entertainment for achieving development goals.[1] In addition to imparting educational information, education-entertainment (*edutainment)* programs have also focused on the use of role models to inspire preference change and attitudes. Bjorvatn et al. (2015) find that exposure to an *edutainment* program in Tanzania, aimed at secondary schools students had a positive impact on entrepreneurial activities, but a negative one on students' educational performance. Cheung (2012) provides evidence that exposure to a radio edutainment program positively affects women's decision making power and children's primary school attendance in Cambodia. A recent paper by Banerjee et al. (2017) investigates the effect of an MTV TV series on attitudes and behavior related to HIV of young people in Nigeria.[2]

[1] See La Ferrara (2016) and DellaVigna and La Ferrara (2015) for a review of the literature. Jensen and Oster (2009) and La Ferrara et al. (2012) show how fertility is affected by being exposed to TV fiction. Ravallion et al. (2015) provide evidence that a public information campaign on an anti-poverty program in India changed perceptions, but not reality in the treated villages.

[2] The impact of entertainment shows on behavior has also been examined in developed country contexts. See, for example, Kearney and Levine (2015).

The paper closest in spirit to ours is Bernard et al. (2014) who investigate the impact of screening documentaries about people who had succeeded in agriculture or small business in Ethiopia. Six months after the screening of the documentaries, aspirations are improved among treated individuals. In particular, the authors provide evidence that the documentaries impacted on savings and credit behavior, and children's education.

Our paper contributes to this literature in three ways. First, this paper proposes a cost-effective and potentially scalable way in which vulnerable and excluded groups, in this case women living with HIV, can be inspired to realize their capabilities. A few studies show how stereotypes can affect the way individuals from disadvantaged groups behave and the way they perceive their abilities. Guyon and Huillery (2014) provide evidence that disadvantaged individuals perform worse when they are reminded of their group. Similarly, Hoff and Pandey (2006, 2014) show how making identity salient can negatively affect performance of low-caste boys. We find evidence that removing the stigma associated with being HIV-positive, by imparting the message that it does not prevent women from fully engaging in economic activities, significantly improves outcomes.

Second, our role models are relatable to our sample and have achieved attainable goals. The message our role models portray is indeed inspiring but is also realistic. We show that even with just marginally more successful women there can be significant effects.[3] Bernard et al.'s (2014) role models stress the importance of the support of elders, extension officers and advisors. For vulnerable groups such as women living with HIV this can be problematic as they often do not have access to

[3] Beaman et al. (2009) and Beaman et al. (2012) examine the impact of female role models in leadership positions and find positive impacts on stereotypes about the role of women in public and domestic life and the effectiveness of female leaders in the case of the former, and the career aspirations and educational attainment of adolescent girls in the case of the latter. We show that even relatable female role models can lead to behavioural change.

these services and supports. Our role models identify hardships that they encountered on the way which makes our subjects relate to them.

Third, the videos are not just motivational but also convey practical information. We find evidence that the information the inspiring women convey in the videos is taken on board by the women in our sample and changes the decisions they make in relation to their economic activities exactly in the way we would expect. This suggests that role models could be used not only as a tool for inspiring individuals but is also a possible alternative to costly education and training programs which have often been found to have mixed effects on economic outcomes (see, for example, Bandiera et al. (2017) and de Mel et al. (2014)).

The rest of the paper is organized as follows. In section 2 we set out the context for our study, and describe the intervention and the experimental design. Section 3 describes the baseline data, discusses attrition and presents the econometric specification. The results are presented in section 4 and section 5 concludes.

2. Sampling and Experimental Design

Participants in the project were randomly selected among HIV-positive women attending 16 health clinics in Uganda. The data used in our analysis consist of a sample of patients attending type III and IV clinics, run by our partner institution, the Joint Clinical Research Centre (JCRC).[4] A health centre III facility is located at sub-county level and serves about 20,000 people. These usually have about 18 staff, led by a senior clinical officer with a general outpatient clinic, a laboratory, and a maternity ward. Health centre IV facilities serve a county or a parliamentary

[4] Uganda's health system is divided into national and district-based levels. At the national level are the national referral hospitals, regional referral hospitals, and semi-autonomous institutions including the Uganda Blood Transfusion Services, the National Medical Stores, the Uganda Public Health Laboratories and the Uganda National Health Research Organization (UNHRO) (MoH, 2010). The district-based health system consists of 4 levels of health centres (I-IV). Type I and II clinics were ruled out from the analysis due to their small catchment area.

constituency with about 100,000 people benefitting from its services. It provides the same services as health centre III clinics, but also has wards for men, women, and children, and can admit patients. In addition, they have a senior medical officer, an additional doctor, as well as a theatre for carrying out emergency operations (MoH, 2000).

Random sampling was performed in the following way. Four sub-regions were randomly selected (Central, Mid-Northern, Mid-Western, South-Western) out of the six Ugandan sub-regions.[5] Within each sub-region, 4 clinics (type III and IV), among those run by our partner institution JCRC, were randomly selected. Clinics within each sub-region were randomly assigned to the control or the treatment group, for a total of 8 clinics in the treatment group and 8 clinics in the control group. The fieldwork team set appointments for a three-day visit in each clinic.[6] Participants in the project were selected among the HIV female patients attending the clinic on the days of the fieldwork visit. The fieldwork team was introduced to the patients waiting for their medical appointments by the medical staff, while a description of the project was provided to potential participants by the fieldwork leaders. Once participation was agreed and written consent sought, enumerators positioned themselves on the clinic grounds (in the open) and proceeded with face-to-face interviews, collecting information on demographics, health, agricultural production, business activities, household members, savings and credit. The baseline took place between April and September 2014 and on average of 132 patients were recruited in each clinic. Appointments with the fieldwork team for

[5] Of the four sub-regions, the Mid-Northern is the one with the highest poverty level, as shown in Table B1 of Appendix B, with 43% of the population classified as poor.

[6] The fieldwork team was led by two of the authors. Extensive training was provided by the authors to the rest of the fieldwork team at the beginning of each survey round. Survey data were collected using portable tablets and using the survey software Fluidsurveys. Weekly Skype meetings were held between the fieldwork team and the authors and a report on the data collection was made available to the authors on a weekly basis.

the subsequent intervention/interview rounds were made to coincide with the participants' routine medical appointments.[7]

Treatment: Role models videos

The videos were screened in 8 treatment HIV clinics, distributed across the four sub-regions. A three-minute video was shown for each round of intervention, each featuring an inspiring woman, who describes her own true story from discovering her HIV status to the challenges and rewards from setting up their own business. A group discussion took place during and after the video screening. Participants were divided into groups, as they came along for their visit at the health clinic. For each group, the video was shown a first time, with one of the co-authors interrupting the screening at set moments, to recap the main highlights of the woman's story. The interruptions were determined in advance at the start of each round of the intervention. After the first screening, the video was shown one more time to the same group of participants, but without any interruption. A group discussion followed the second screening of the video. Specific instructions were provided to guide the group discussion.

The casting of the inspiring women was conducted by our partner institution, JCRC, and the women were selected among the HIV patients attending their clinics.[8] The casting was conducted with the aim of offering role models that could be relatable to our sample and had achieved attainable goals. Six women were filmed and eventually four videos were picked to be screened. The woman featuring in the first video is from the Central region of Uganda and speaks Luganda. The remaining three women are from the South West of Uganda and speak Rutooro.

[7] All participants in the treated and control clinics received a small monetary compensation for attending the clinic on the days of the interview. Similarly, all health workers in treated and control clinics received a small monetary incentive during each round of the survey.
[8] The casting did not involve any of the women in our sample of clinics.

The four women in the videos were given the option of revealing their HIV status, ahead of the filming. They were informed that the videos would be screened in health clinics and who the target audience was. All four of them decided to reveal their HIV status. Filming took place in October 2014 by director Tom Burke of Broadstone Films, an Irish-based video production company.

The videos were shot exclusively for the purpose of this project and they all featured the same structure: a) background information; b) description of how the business was started; c) discussion of the challenges faced; d) targets for the future; e) final inspirational message.[9] The stories presented in the videos mainly relate to agricultural business activities, and advice is given by the inspiring women regarding business strategies in livestock trade and setting up small enterprises. Therefore we would expect a greater impact of the treatment on this form of income compared with other income-generating activities. Although the plot was similar across the four videos, each of them highlights different aspects of the challenges and goals of the four inspiring women. The women in the first video and the last are very charismatic and positive. The woman in the second video stresses the importance of her children's education as a driving force behind her entrepreneurial activities. The woman in the third video focusses on providing business advice and tips.[10] The role models were asked to conclude their interview with a message to encourage viewers that success was possible for them too. For example, the second video featured Alice, whose message was "*I run my own business. I have done this and you too can do it*". Posters featuring the inspiring women were affixed in each treated clinic at the end of the screening to reinforce the inspirational message.

[9] The video talking points were agreed with the director in advance of the shooting. The videos are the edited version of the interviews based on the talking points. The first video is in Luganda language, the rest of the videos is in Rutooro. An interpreter was hired to translate the videos in the clinics in the Mid-Northern clinics. The full transcripts of the videos and links are provided in Appendix A.

[10] The order of the videos was decided by the researchers on the basis of the inspiring women's interviews.

The first intervention round took place between October and December 2014 and each clinic was visited for two days. Participants in both control and treatment groups were reminded by phone to attend their clinic for their routine medical appointments. The first video (Sarah's story) was screened in the treatment clinics, followed by a brief face-to-face survey.[11] The second intervention round took place between January and March 2015, during which the second video (Alice's story) was screened. The second intervention followed the same pattern as the first one, with a two-day visit to each clinic. The mid-line evaluation took place at the same time as the third intervention round (Jovia's story), and a longer questionnaire was administered by the enumerators. The fourth and last intervention round (Mugenyi's story) took place between July and August 2015. The end-line evaluation was administered between September and December 2015.

Control group

Participants in the control group were recruited into the project in the same way as participants in the treatment group. After the baseline, participants in the control group were invited to attend the health clinics for their medical appointments and for the brief face-to-face survey. The visits to the control clinics took place at the same time as the treatment interventions. At each meeting, the women in the control group were administered a short questionnaire, similar to the questionnaire for the treatment group. At each meeting, participants in the control group gathered around the grounds of the HIV clinic, while waiting for their interviews and their medical appointments, in the same way as participants in the intervention groups. The only difference was that participants in the treated clinics were shown the videos while waiting.

[11] The face-to-face surveys during the intervention phases gathered basic information about any changes affecting the woman (e.g. pregnancy, illness), attendance at the HIV clinic, ARV use and eating habits.

[Insert Figure 1 here]

3. Empirical strategy

We test the impact of the treatment, exposure to role models via videos, on a set of core outcomes including entrepreneurial activities, income and livelihoods, a set of secondary outcomes including health, education, savings and credit and, finally, a set of outcomes that help to explain the underlying mechanisms at work. Equation 1 presents the econometric specification used in our analysis.

$$O_{it} = \delta_1(Video_i * Evaluation_t) + \gamma Evaluation_t + \alpha_i + \mu_t + \varepsilon_{it} \quad (1)$$

where O_{it} is the particular outcome variable of interest for woman *i* in time period *t*. $Video_i$ is a dummy indicator for whether woman *i* is in a treatment clinic. $Evaluation_t$ is a dummy indicator for the time period – zero for the baseline and one for the mid-evaluation and end-line evaluation; α_i are participant fixed effects; μ_t are round fixed effects. Standard errors are clustered at the clinic level. Given the small number of clusters, we correct the clustered standard errors using wild bootstrapped standard errors as outlined in Cameron et al. (2008). This method is more reliable than other asymptotic tests with data clustered in as few as five groups. We also present the randomization inference p-values which correct for the cluster randomization and the small number of clusters.

Descriptive statistics

Our sample at baseline consists of 2,121 women. Table 1 presents a series of balancing tests to compare the control group with the treatment group, prior to the intervention. While our sample is reasonably balanced across the treatment and

control groups on most of the demographic characteristics and outcome variables there are some differences that warrant mention. Participants in the control group tend to be 1 year older than participants in the treatment group. In terms of outcome variables, we find a higher percentage of children are absent from school due to school fees in the treatment group. In terms of income and livelihoods, we find that women have slightly higher incomes in the control group and that this is due to higher levels of income from crops. Crucially, however, there is no statistically significant difference in the proportion of women that operate an enterprise (i.e. self-employed), the key outcome of interest. Given the potential impact of role models on empowerment and decision bargaining within the household, panel E presents the balancing tests in relation to how decisions are taken within the household. A higher percentage of participants in the control group maintain that decisions on individual income are taken by the respondent alone, while a lower percentage claims that decisions are taken jointly with the partner or somebody else in the households. Regarding household income, a higher percentage of respondents in the control group claim that decisions are more likely to be taken by the husband, rather than jointly, relative to the treatment group.

Overall, the two samples are very well balanced in terms of demographics and where there are statistically significant differences in outcomes, they work against the treatment having any impact.[12]

[12] P-values are based on standard t-tests. Multiple Hypothesis Testing (MHT) procedures are also used which leads to much higher p-values (List et al., 2016). The only statistically significant differences at baseline using MHT is that a higher percentage of children are reported to be absent from school in the treatment group compared with the control group, a small difference in total personal income with households in the control group having slightly higher incomes than those in the treatment group (significant at the 5 per cent level), a higher percentage of participants in the control group who report that decisions on individual income are taken by the respondent alone, and a lower percentage who claim that decisions are taken jointly with the partner or somebody else in the household. We use standard t-tests here as they are less conservative and give us a higher chance of rejecting the null of no differences across treatment arms.

[Insert Table 1 here]

Follow up surveys and attrition

As detailed in the previous section, participants in the project are HIV patients attending their scheduled routine medical appointments at their regular health clinics. Interviews and video screenings took place while patients waited for their medical appointment. Table 2 presents the attrition rates over the project time period. The attrition rate between the baseline and the mid-line was 38%, while the attrition rate between the baseline and the end-line was 44%. The majority of women that left the study did so between the baseline and the first intervention, while there was very little attrition between intervention/evaluation rounds.

Following recruitment to the project at baseline, participants were contacted by phone with information about their next medical appointment and the meeting with the research team. Women were not informed at baseline of the exact nature of the intervention in either treatment or control group. Given the population under consideration, attrition might arise for four reasons: missed medical appointments, either because the women are too weak to travel to the clinic or because they are busy on the day of the visit; transfer to another HIV clinic; refusal to participate in the project; or death. According to the information provided by the clinic staff to the research team, the first main reason that women left the project between baseline and mid-line was due to the assignment of patients to other HIV clinics. Re-assignment was due to bureaucratic reasons and was not in any way related to our project. The second main reason was death.

Attrition is potentially of concern for two reasons. First, if the characteristics of attriters are different to those who remain in the study and these characteristics are related to outcomes, and second, if the characteristics of attriters are different across the treatment and control groups. We explore the pattern of attrition by estimating

a regression of the probability of attriting on the key outcome variables of interest and the control variables at baseline, assignment to treatment and the interaction between them. The results are presented in Appendix B2. We find no difference in the probability of attrition between treatment and control group. In terms of baseline characteristics, we find that attrition is negatively correlated with the number of years since diagnosis with HIV, personal income and the probability of engaging in waged work. While each coefficient is only marginally statistically significant, it does suggest that attriters are slightly worse off than those who remain in the experiment. This should be borne in mind when considering the implications of our findings more broadly and suggests that even when targeting vulnerable groups, as is the case in this paper, the poorest are still the most difficult to reach.

Of importance for the internal validity of our experiment is the fact that there is no difference between the treatment and the control group in the baseline characteristics of attriters. Indeed, the extent of attrition is similar across both groups; the rate of attrition between baseline and end-line was 44.1 per cent for the control group and 44.6 per cent for the treatment group, while the proportion of never attritors (i.e. present at baseline, mid-line and end-line) in each group is 46.3 per cent and 45.7 per cent, respectively. Nevertheless, given that the overall rate of attrition is high, we ensure that our results are robust to accounting for the differential rate of attrition in the treatment and control groups using Lee's (2005) bounding approach.

[Insert Table 2 here]

4. Results

The first set of outcomes we consider captures the extent to which we observe behavioral change in relation to enterprise activities, income and livelihoods as a result of the intervention. The results for each of these outcome variables using the

specification in equation (1) are presented in Table 3. Standard errors are clustered at the clinic level and p-values for the t-test constructed using the wild bootstrapped standard errors are presented in brackets. We present the randomization inference p-values in braces which corrects for the cluster randomization and the small number of clusters. [13] We also present the difference in means between the treatment and control groups at end-line but rely on the findings from the difference-in-difference specification which addresses any concerns about balance across treatment and control groups at baseline. We also report the p-value of the Multiple Hypothesis Testing procedure outlined by List et al. (2016) for the tests of the differences in means presented in each table.

Our first outcome variable of interest is whether or not women are self-employed. This is defined as operating some kind of enterprise in any sector and covers agricultural enterprises such as selling crops or livestock. At baseline, approximately 27 per cent of women operate an enterprise. Many women (22.6 per cent) who operate an enterprise also work for a wage. We find that women in treatment clinics are more likely to operate an enterprise (column 1), in accordance with the message of the videos, which highlights the stories of women running their own business enterprises. The effect is sizable with women in the treatment clinics 13.8 percentage points more likely to operate an enterprise as a result of the intervention than women in the control group. This finding provides evidence that exposure to role models has a positive impact on the probability of operating a business. We do not find any impact on the probability that the women in treatment clinics work for a wage (column 2). This result is to be expected, given the message contained in the video, which featured self-employment examples.

[13] To perform randomization inference we randomly assign clinics to treatment and control groups within regions and estimate each specification. We repeat this exercise 1,000 times for each outcome and construct the p-value as the proportion of times that the absolute value of the randomization inference coefficient is greater than the absolute value of the actual coefficients from our sample (see Young (2017)).

Column 3 reports the impact of the treatment on the (log of) total personal income.[14] The videos were effective in increasing total personal income and the magnitude of the effect appears large. Exposure to the videos increased women's personal incomes by 158 per cent. The large magnitude can be explained by the low average personal incomes at baseline.[15] In column 4 of Table 3 we find that the treatment had no impact on other household income (excluding the personal income of the women), which is to be expected given that it is only women's personal economic activities that are the subject matter of the videos. We investigate the impact on enterprise activity and personal incomes further by separating the different components that make up total personal income. Column 5 shows that the treatment had no effect on income from waged employment. This is also to be expected given that the message contained in the videos targets enterprise activity and not waged employment. Next, we investigate the effect of the treatment on crop income, income from livestock and income from enterprises. Given that the stories presented in the videos mainly relate to agricultural business activities, and in particular regarding business strategies in livestock trade and setting up small enterprises, we would expect to see a greater impact of the treatment on income generated from these activities. This is indeed the case, as shown in Column 6, 7 and 8. Women in treated clinics have a higher crop income, a higher livestock income and a higher enterprise-related income.[16] While there is no statistically significant difference in overall average personal incomes between the treatment and control groups at end-line, the treatment group continue to earn higher incomes

[14] Income variables are trimmed for outliers by replacing all values in the top percentile of the income distribution as missing. A value of one is added to all zero values for income before logs are taken. All results are robust to the inclusion of outliers and to using levels instead of the log transformation. Results are available on request.

[15] Standardizing the effect yields a standardized coefficient of 0.568. The standardized coefficients are reported in Table B3 of Appendix B.

[16] We do not find any specific pattern in the type of new enterprise set up by participants in the treatment group. Results are available upon request.

from livestock and enterprises. This suggests that the effect on these sources of income sources is persistent and may be long-lasting. We investigate this further in Table 4 below.

In Table 4 we separate out the effect of the videos on income and its components at mid-line and end-line. We find that the videos provide an initial boost in total personal income as evident from the large effect at mid-line. This is partly due to a large fall in income between baseline and mid-line in the control group. This drop in income in the control group is evident across all clinics and all sources of income. It is, however, mainly driven by a fall in wage income.[17] Treatment clinics experience a similar fall in wage income between baseline and mid-line but incomes from other sources (crops, livestock and enterprises) increase. Overall incomes of women in control clinics recover between mid-line and end-line while income from both livestock and non-agricultural enterprises in the treatment group continue to increase between mid-line and end-line.

Our findings suggest that providing vulnerable women with role models that empower them to start their own enterprise activities may be very effective in improving objectively-measured welfare outcomes, namely income. While the effect is strongest in the short-run there is evidence, at least for the activities in focus, that personal incomes from these sources continue to grow in the medium term.

[Insert Table 3 here]

[Insert Table 4 here]

[17] The fall in wage income is evident for the whole sample and for the balanced panel of women that are present in both survey rounds.

As discussed in the introduction, two mechanisms might be at play. First, role models provide the information that participants may need to set up their own business, thereby providing a training function, and second, the role models provide inspiration, which empowers women to change their actions. To explore the first channel, we consider the extent to which the actual content of the videos and the timing of the screening of the different videos maps to changes in associated outcomes. The inspiring women give some practical advice on business strategies in relation to livestock trade and in particular with respect to poultry and pigs trade. Table 5 explores the changes in the portfolio of livestock. Women in the treated clinics are found to increase the number of poultry units and pig units. This is indeed in line with the message in the videos: the third and fourth videos give advice on why to keep chickens ("*because from eggs alone you can buy books*") and what the best strategies are for trading chickens ("*The chickens I never sell at once but keep selling some and replacing them*"). Similarly, for pigs, the inspiring woman in the third video gives some practical advice on the best strategies for selling pigs ("*For me, I sell piglets for 50,000. If you buy a female pig within a year, you can make a lot of money. Imagine a pig can produce 9-12 piglets and for 50,000 each piglet, how much is that?*"). No similar advice is given with respect to cow or goat trade. In line with the video content, we do not find any impact of the treatment on the number of cows or goats held by participants in treated clinics. Table B4 in the Appendix further explores the matching between video content and decisions in relation to livestock units. Chickens are mentioned in video 3 and video 4, while pig rearing is mentioned across the four videos. Indeed, when we explore the timing of the effect, we see that exposure to the treatment leads to a high number of poultry units in the end-line evaluation only, with no statistically significant difference at mid-line. Moreover, the treatment has a positive and statistically significant impact on the number of pigs at both the mid and end-evaluation.

[Insert Table 5 here]

The second video features the story of an inspiring woman who runs a retail shop. Among the four inspiring women, she is the only one running such a business activity. If the role model videos were effective in providing information and shaping the behavior of viewers, we would expect an impact of the treatment on the probability of opening a retail shop in the mid-line evaluation, which was conducted three months after the second video was screened. This is indeed the case, as shown in Table 6. Exposure to the video has a positive and statistically significant impact on the probability of opening up a retail shop at mid-line evaluation. The results are confirmed also when we restrict to the sample of participants who started a business. The coefficient for the impact of the treatment at end-line is statistically insignificant suggesting that there is no difference between the mid-line and end-line in terms of the extent of the impact. Although, it should be noted that the difference in simple means at end-line is statistically significant, even when multiple hypothesis testing is accounted for.

[Insert Table 6 here]

Taken together, these results show that the participants act upon the information included in the videos. To explore the second mechanism, the inspirational channel, in Table 7, we present the results of the impact of the role models on intra-household bargaining power. We measure bargaining power through a series of questions about the control of resources within households. We restrict our sample to women who, at baseline, co-habit with a partner. We find that the video campaign impacts positively on the probability of a women having sole control over her personal income and negatively on joint control with her partner or spouse. We find no impact on the control over household income. This suggests

that the role models campaign is also empowering for women, not only leading them to earn higher incomes, but also leading them to have more control over what that income is spent on. The lower panel of Table 7 shows, however, that we cannot reject the null hypothesis of no statistically significant difference between the treatment and control group at end-line suggesting that this effect may be short-lived. In order to better investigate this issue, Table 8 reports the impact, separating the effect of the video campaign at the mid-evaluation and the end-line evaluation. It appears that the effect on empowerment slightly decreases over time, and the main effect seems to take place at mid-line.

[Insert Table 7 here]

[Insert Table 8 here]

Other results

The stories of the role models were not scripted and the women provided other types of advice during the videos in particular in relation to health and education. One of the recurring messages in the videos is related to the HIV status of the role models. This was not intended when the talking points of the interviews were drafted by the research team, but it emerged organically in the casting ahead of the filming and during the interview. Indeed, all of the four inspiring women mentioned that they were diligent in taking the ARV drugs and in looking after their health. Similarly, the importance of education and issues and strategies related to paying school fees emerged in each of the interviews. Therefore, in Table 9 we explore the impact of the intervention on the health of the women and children and on children's education. We find that the videos led to better health among women, as the intervention decreases the probability of being sick over the period prior to the

interviews by almost 10 percentage points (column 1).[18] Even more interestingly, the percentage of children that are reported as being sick is also lower in the treatment group. This result might arise for two reasons: first, women's higher income might translate into more resources being devoted to children's health; second, if children are also HIV positive, then reinforcing the message that it is important to take the ARV drugs might have a positive effect on children's health as well.

Columns 3 to 5 investigate the impact of the role models on children's education. A smaller percentage of children are reported to be absent from school among the women in the treatment group (column 3). In particular, a lower proportion of children are absent from school because of the inability to pay school fees (column 4). We find no evidence of the treatment having an impact on the probability of not attending school due to sickness (column 5). Table 10 explores whether the effect of the role models on children's education is different at mid-line and end-line. Columns 1 to 3 provide evidence that, although the effect decreases over time, the role models have a statistically significant impact on children's health and their education.

[Insert Table 9 here]

[Insert Table 10 here]

[18] In the absence of official data on the health status of women, the health measures that we use is self-reported by the women in our sample. Women are asked the following question: 'In the past 30 days, have you suffered from any illness or injury that prevented you from going about your daily activities?'. They are also asked to report this information for all household members including children. This measure may capture both changes in health and changes in the general well-being and attitudes of the women. This should be borne in mind when interpreting these results.

Finally, Table 11 explores the impact of the videos on food expenditure, formal and informal savings, formal and informal credit. Given the message of one of the videos on the importance of savings to invest in the business enterprise, we would expect the treatment to have an impact on savings. Indeed, this is the main finding emerging from Table 11: women in the treatment group are found to have more informal savings (column 3), while no effect is found for formal savings or credit. We find that the treatment increases savings by 136 per cent, although this is from a very low level of savings at baseline.[19] The increase in savings accounts for around 30 per cent of the increase in income. This is indeed a remarkable result, which may lead to future investments in business activities.

[Insert Table 11 here]

Robustness to attrition

As discussed in section 2, one potential challenge to our identification strategy is the high rate of attrition between baseline and the first intervention round. While the descriptive statistics presented in section 2 suggest it is not a major cause of concern, particularly given that there do not appear to be systematic differences between the treatment and the control group in terms of the characteristics of attriters, we check the robustness of our results for differential attrition rates between the treatment and the control group using the bounding procedure outlined by Lee (2005) for the main income related outcomes. The procedure requires a monotonicity assumption in that assignment to treatment can only affect sample selection in one direction. Given that we have more attrition in the treatment group,

[19] The standardized effect is 0.273 (see Table B3 of Appendix B). Bernard et al. (2014) also find an effect of exposure to the role models documentaries on savings with savings almost 50 percent higher in the treatment group relative to the control group. They attribute this to increased aspirations among the treated group which lead to more forward-looking behavior.

in our case we must assume that there are some women that would have attrited if they had of been assigned to the treatment group, but no women that would have attrited because they were assigned to the control group.

To construct the upper (lower) bound, we trim the upper (lower) tail of the distribution of the outcome variable in the control group so that the sample sizes are equal in both groups. The proportion of observations to be trimmed is the difference in the attrition rates between the treatment and the control as a proportion of the retention rate of the control group. Given that we have different rates of attrition at mid-line and end-line we trim the distribution separately in each round. We also take account of attrition due to missing values separately for each outcome variable. Given that we have a high number of observations bunched at zero on the income variables, for the lower bound we randomly select observations at zero that are trimmed.

The results are presented in Table B4 of the Appendix which also illustrates the proportion of observations trimmed at mid-line and end-line in the control group for each variable. The results reveal quite tight bounds around our point estimates suggesting that they are not affected by attrition. It does however, remain the case, that attriters are slightly worse off than the overall sample which should be borne in mind in interpreting our results. Finally, to account for attrition between intervention rounds we also estimate all specifications for the balanced panel of data (976 women) who are present at baseline, mid-line and end-line. All of our findings hold.[20]

Robustness to experimenter demand effects

Experimenter demand effects are also a possibility for two reasons. First, it is possible that enumerators had more interaction with the women in the treatment

[20] Results are not presented here but are available on request.

clinics than in the control clinics. To mitigate this concern, enumerators spent the same amount of time in the control clinics during each intervention round. They surveyed each woman at each clinic visit and so had the same level of one-to-one interaction with the women as in the treatment group.

Second, our outcomes of interest are self-reported and so it is possible that the women report what they think the enumerators want to hear. If this is the case then such misreporting is more likely at the mid-line evaluation when women are surveyed directly after the intervention. The end-line evaluation took place three months after the last intervention and so misreporting is less likely. As such, we examine how outcomes changed between baseline and end-line and exclude the mid-line data. The results are presented in Table B6 of the appendix. While being self-employed and the overall level of personal income are not well determined, the coefficients are positive. Income from livestock and enterprise income are positively impacted by the treatment.[21] We also find an increase in the number of chickens and pigs as a result of the treatment, an increase in the control of women's control of resources in the household, a reduction in the absence of children from school due to the inability to pay school fees and an increase in informal saving.

Examining the extent to which the treatment impacts outcomes between mid-line and end-line also provides us with some reassurance on the extent to which we should be concerned about experimental demand effects. The results are presented in Table B7 of the Appendix. We find that income falls for the treatment group relative to the control group during this period, in particular crop income. If experimenter demand effects are driving the increase in reported income between baseline and mid-line then the fall observed between mid-line and end-line could be detecting a re-adjustment given that the end-line takes place three months after the last intervention. The fact that no other income related outcomes change (aside

[21] There is no net effect on income due to the drop in wage income in the treatment clinic relative to the control clinic between baseline and end-line as discussed above.

from a slight increase in the number of poultry units) provide some reassurance that this is the case and at a minimum the results presented in Table B6 are less likely to be driven by experimenter demand effects.

5. Conclusions

In this paper, we test the impact of a role model intervention on the enterprise activity, income and livelihoods of women living with HIV in rural Uganda. Participants in our treatment group were exposed to the screening of four 3-minute videos of inspiring women, i.e. women living in similar situations to the women in our study. In the videos, each of the inspiring women tells their story of the difficulties and rewards of setting up a business. The videos encompass personal stories (being HIV positive, the importance of education for their children) along with practical advice on setting up and running a business. The four videos were screened at HIV clinics over the space of one year. We find that the role models intervention has a positive effect on the probability of starting a business, personal income and income from enterprises and crops. We provide evidence of two channels at work: an information channel, whereby women learn from the content of the videos and change their behavior accordingly; and an inspirational channel which empowers women as shown through an increase in control over personal resources within the household. The intervention also improves the health of women and children and reduces the probability that children are absent from school. Moreover, we find a positive impact of the role models intervention on the informal savings of women. The latter two findings suggest that this simple, cost effective and easily scalable intervention could have long term effects on welfare outcomes. Our findings show that providing vulnerable women with role models that empower them to start their own enterprise activities may be very effective in improving quantifiable outcomes.

Overall, our results shed light on the extent to which role models can have a real impact on the livelihoods of disadvantaged groups (women) who carry a social stigma (being HIV-positive). They also allow us to understand better the underlying behavioral changes that lead to improved outcomes for women and their children.

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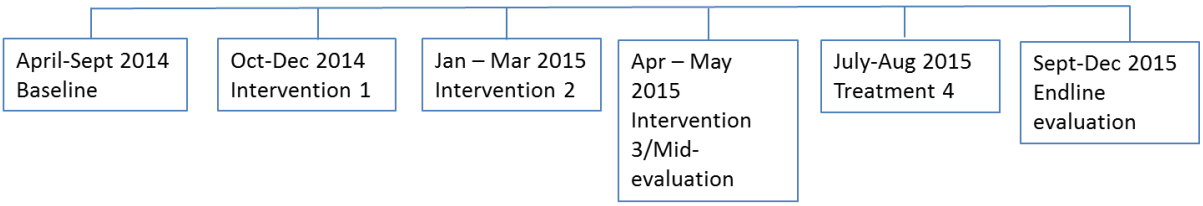
Figure

Figure 1: Timeline



Tables

Table 1: Summary statistics and balancing tests

A. Demographics	Mean Control	Mean Video	Difference	P-value
Age	38.899	37.564	1.335	0.009
Number of adults	1.333	1.258	0.074	0.200
Number of children	2.258	2.287	-0.029	0.734
Widow/single	0.582	0.556	0.026	0.314
Years diagnosed HIV	5.504	5.392	0.112	0.598
Years on ARV	2.991	2.726	0.265	0.149
No education	0.354	0.344	0.010	0.680
B. Health and Children Education	**Mean Control**	**Mean Video**	**Difference**	**P-value**
Illness	0.270	0.256	0.014	0.533
% children sick	0.100	0.120	-0.020	0.154
% children absent school	0.359	0.469	-0.110	0.000
Absence - school fees	0.313	0.390	-0.077	0.006
Absence – illness	0.220	0.223	-0.003	0.905
C. Income and Livelihoods	**Mean Control**	**Mean Video**	**Difference**	**P-value**
Food expenditure (log)	9.470	9.339	0.131	0.080
Total personal income (log)	10.127	9.636	0.491	0.001
Other HH income (log)	3.988	3.770	0.219	0.432
Wage – personal (log)	5.054	5.203	-0.149	0.577
Crop income – persona l(log)	4.155	3.634	0.521	0.040
Livestock income – personal (log)	1.045	1.166	-0.121	0.455
Non agricultural income – personal (log)	1.906	2.121	-0.215	0.323
Work for wage	0.471	0.498	-0.027	0.288
Self-employed	0.268	0.283	-0.015	0.508
D. Savings and credit	**Mean Control**	**MeanVideo**	**Difference**	**P-value**
Informal savings – amount (log)	0.770	0.941	-0.171	0.243
Formal savings – amount (log)	2.479	2.330	0.149	0.528
Informal credit – amount (log)	0.722	0.678	0.044	0.747
Formal credit – amount (log)	1.735	1.458	0.277	0.175

E. Decision on: *(Cohabitant participants only)*	**Mean Control**	**Mean Video**	**Difference**	**P-value**
Individual income – alone	0.919	0.858	0.061	0.000
Individual income – husband	0.017	0.025	-0.007	0.329
Individual income – joint	0.060	0.111	-0.051	0.000
Household income – alone	0.533	0.530	0.003	0.919
Household income – husband	0.148	0.140	0.008	0.693
Household income - joint	0.219	0.236	-0.017	0.472

Table 2: Sample and attrition

	Full Sample	**Control**	**Video**
Baseline	2,121	1,067	1,054
Intervention 1	1,201	644	557
Intervention 2	1,240	607	633
Intervention 3/Mid-line	1,324	669	655
Intervention 4	1,225	600	625
End-line	1,179	596	583
Balanced panel	976	494	482

Table 3: Income and livelihoods

	(1) Operates an Enterprise	(2) Works for a wage	(3) Personal Income	(4) Household Income	(5) Wage Income	(6) Crop Income	(7) Livestock Income	(8) Enterprise Income
Eval x video	0.138	-0.083	1.580	0.647	-0.622	1.585	0.901	1.035
s.e.	(0.068)*	(0.075)	(0.278)***	(0.653)	(0.532)	(0.574)**	(0.207)***	(0.328)***
P-value WB s.e.	[0.066]*	[0.332]	[0.000]***	[0.324]	[0.264]	[0.006]***	[0.002]***	[0.006]***
P-value RI	{0.015}**	{0.296}	{0.001}***	{0.265}	{0.049}**	{0.026}**	{0.000}***	{0.009}***
Evaluation	-0.006	0.004	-1.187	-0.261	-0.367	-0.153	-0.054	-0.141
s.e.	(0.035)	(0.045)	(0.258)***	(0.447)	(0.416)	(0.432)	(0.137)	(0.212)
Baseline mean control	0.268	0.470	10.127	3.988	5.054	4.155	1.045	1.906
End-line diff in means:								
videos – control	0.156	-0.083	0.052	0.401	-1.002	0.656	0.958	1.144
t-test (p-value)	0.000	0.004	0.578	0.203	0.001	0.022	0.000	0.000
MHT (p-value)	0.000	0.035	0.994	0.901	0.000	0.296	0.000	0.000
Observations	3,969	3,974	3,705	3,752	3,941	3,941	3,943	3,946
R-squared	0.030	0.015	0.088	0.003	0.018	0.027	0.022	0.039
Number of women	1,502	1,502	1,485	1,490	1,496	1,502	1,502	1,502

Robust standard errors (s.e.) clustered at the clinic level presented in parenthesis. P-values for t-test of parameter significance using wild bootstrapped (WB) standard errors presented in brackets (Cameron et al., 2008). Randomization inference (RI) p-values are presented in braces (Young, 2017). All specifications include women fixed effects and round dummies. MHT presents the p-value from the Multiple Hypothesis Test of the difference in means between treatment and control group at end-line accounting for multiple outcomes (List et al, 2016). .*** p<0.01, ** p<0.05, *p<0.1

Table 4: Income and livelihoods – supplementary

	(1) Personal Income	(2) Wage Income	(3) Crop Income	(4) Livestock Income	(5) Enterprise Income
Mid-line x videos (1)	2.586	-0.330	2.123	0.938	1.342
s.e.	(0.348)***	(0.686)	(0.606)***	(0.330)**	(0.379)***
P-value WB s.e.	[0.000]***	[0.655]	[0.006]***	[0.022]**	[0.002]***
P-value RI	{0.000}***	{0.357}	{0.005}***	{0.021}**	{0.010}**
End-line x videos (2)	0.407	-0.963	0.955	0.857	0.675
s.e.	(0.253)	(0.497)*	(0.638)	(0.216)***	(0.370)*
P-value WB s.e.	[0.162]	[0.066]*	[0.164]	[0.002]***	[0.090]*
P-value RI	{0.122}	{0.055}*	{0.186}	{0.004}***	{0.072}*
Mid-line	-1.659***	-0.510	-0.414	-0.072	-0.291
s.e.	(0.254)	(0.479)	(0.448)	(0.164)	(0.240)
End-line	0.618***	0.847**	0.525	0.345**	1.015***
s.e.	(0.115)	(0.349)	(0.401)	(0.137)	(0.202)
F-test of (1)=(2)	60.71***	1.18	5.78**	0.04	3.38*
Mid-line diff in means:					
videos – control	2.097	-0.167	1.603	1.097	1.346
t-test (p-value)	0.000	0.559	0.000	0.000	0.000
MHT (p-value)	0.000	0.914	0.000	0.000	0.000
End-line diff in means:					
videos – control	0.052	-1.002	0.656	0.958	1.144
t-test (p-value)	0.578	0.001	0.022	0.000	0.000
MHT (p-value)	0.994	0.000	0.296	0.000	0.000
Observations	3,705	3,941	3,941	3,943	3,946
R-squared	0.128	0.019	0.031	0.022	0.041
Number of women	1,485	1,496	1,502	1,502	1,502

Robust standard errors (s.e.) clustered at the clinic level presented in parenthesis. P-values for t-test of parameter significance using wild bootstrapped (WB) standard errors presented in brackets (Cameron et al., 2008). Randomization inference (RI) p-values are presented in braces (Young, 2017). All specifications include women fixed effects and round dummies. MHT presents the p-value from the Multiple Hypothesis Test of the difference in means between treatment and control group at mid-line and end-line accounting for multiple outcomes (List et al, 2016). Sample in column (2) restricted to women who start a business between rounds. *** p<0.01, ** p<0.05, *p<0.1

Table 5: Livestock

	(1) Poultry units	(2) Cows Units	(3) Goat units	(4) Pig units
Eval x video	0.636	-0.127	0.154	0.260
s.e.	(0.351)*	(0.394)	(0.168)	(0.069)***
P-value WB s.e.	[0.082]*	[0.729]	[0.436]	[0.006]***
P-value RI	{0.093}*	{0.806}	{0.448}	{0.001}***
Evaluation	0.351	-0.039	-0.092	-0.003
s.e.	(0.241)	(0.093)	(0.071)	(0.024)
Baseline mean control	1.96	0.30	0.82	0.20
End-line diff in means:				
videos – control	1.617	0.327	0.550	0.382
t-test (p-value)	0.001	0.000	0.000	0.000
MHT (p-value)	0.013	0.000	0.000	0.000
Observations	3,980	3,980	3,980	3,980
R-squared	0.005	0.000	0.002	0.024
Number of women	1,502	1,502	1,502	1,502

Robust standard errors (s.e.) clustered at the clinic level presented in parenthesis. P-values for t-test of parameter significance using wild bootstrapped (WB) standard errors presented in brackets (Cameron et al., 2008). Randomization inference (RI) p-values are presented in braces (Young, 2017). All specifications include women fixed effects and round dummies. MHT presents the p-value from the Multiple Hypothesis Test of the difference in means between treatment and control group at end-line accounting for multiple outcomes (List et al, 2016). *** p<0.01, ** p<0.05, *p<0.1

Table 6: Retail business

	(1) Retail	(2) Retail (conditional on starting business)
Mid-line x videos (1)	0.113	0.170
s.e.	(0.031)***	(0.079)**
P-value WB s.e.	[0.000]***	[0.076]*
P-value RI	{0.002}***	{0.090}*
End-line x videos (2)	0.045	0.107
s.e.	(0.045)	(0.110)
P-value WB s.e.	[0.356]	[0.412]
P-value RI	{0.306}	{0.309}
Mid-line	-0.041	0.257
s.e.	(0.017)**	(0.063)***
End-line	0.051	0.225
s.e.	(0.032)	(0.089)**
F-test of (1)=(2)	3.44	0.20
Baseline mean control	0.105	0.014
Mid-line diff in means:		
videos – control	0.123	0.163
t-test (p-value)	0.000	0.019
MHT (p-value)	0.000	0.019
End-line diff in means:		
videos – control	0.065	0.108
t-test (p-value)	0.001	0.138
MHT (p-value)	0.012	0.138
Observations	3,980	597
R-squared	0.024	0.247
Number of women	1,502	215

Robust standard errors (s.e.) clustered at the clinic level presented in parenthesis. P-values for t-test of parameter significance using wild bootstrapped (WB) standard errors presented in brackets (Cameron et al., 2008). Randomization inference (RI) p-values are presented in braces (Young, 2017). All specifications include women fixed effects and round dummies. Sample in column (2) restricted to women who start a business between rounds. MHT presents the p-value from the Multiple Hypothesis Test of the difference in means between treatment and control group at mid-line and end-line accounting for multiple outcomes (List et al, 2016). *** p<0.01, ** p<0.05, *p<0.1

Table 7: Intra-household economic empowerment

	(1) Personal inc alone	(2) Personal inc husband	(3) Personal inc joint	(4) Household inc alone	(5) Household inc husband	(6) Household inc joint
Eval x videos	0.102	-0.021	-0.072	-0.044	0.087	-0.063
s.e.	(0.033)***	(0.012)*	(0.030)**	(0.055)	(0.052)	(0.045)
P-value WB s.e.	[0.012]**	[0.136]	[0.056]*	[0.491]	[0.144]	[0.174]
P-value RI	{0.013}**	{0.082}*	{0.006}***	{0.281}	{0.060}*	{0.117}
Evaluation	-0.085	0.009	0.065	-0.149	0.079	-0.003
s.e.	(0.025)***	(0.012)	(0.016)***	(0.045)***	(0.038)*	(0.030)
Baseline mean control	0.918	0.017	0.060	0.533	0.148	0.219
End-line diff in means:						
video – control	0.022	0.000	-0.022	-0.019	0.051	0.034
t-test (p-value)	0.525	0.993	0.519	0.104	0.249	0.447
MHT (p-value)	0.774	0.988	0.766	0.391	0.619	0.826
Observations	3,381	3,381	3,381	2,481	2,481	2,481
R-squared	0.014	0.012	0.013	0.167	0.028	0.011
Number of women	1,500	1,500	1,500	1,386	1,386	1,386

Robust standard errors (s.e.) clustered at the clinic level presented in parenthesis. P-values for t-test of parameter significance using wild bootstrapped (WB) standard errors presented in brackets (Cameron et al., 2008). Randomization inference (RI) p-values are presented in braces (Young, 2017). All specifications include women fixed effects and round dummies. Sample restricted to women who co-habit at baseline and remain co-habiting for the duration of the study. MHT presents the p-value from the Multiple Hypothesis Test of the difference in means between treatment and control group at end-line accounting for multiple outcomes and the restriction to the sub-group of cohabiting women (List et al, 2016). *** p<0.01, ** p<0.05, *p<0.

Table 8: Intra-household economic empowerment - supplementary

	(1) Personal inc alone	(2) Personal inc husband	(3) Personal inc joint	(4) Household inc alone	(5) Household inc husband	(6) Household inc joint
Mid-line x videos (1)	0.121	-0.030	-0.078	-0.074	0.113	-0.104
s.e.	(0.038)***	(0.015)*	(0.036)**	(0.060)	(0.071)	(0.068)
P-value WB s.e.	[0.006]***	[0.108]	[0.070]*	[0.288]	[0.134]	[0.178]
P-value RI	{0.002}***	{0.060}*	{0.002}***	{0.136}	{0.079}*	{0.118}
End-line x videos (2)	0.082	-0.011	-0.065	-0.011	0.057	-0.015
s.e.	(0.038)**	(0.012)	(0.032)*	(0.057)	(0.068)	(0.049)
P-value WB s.e.	[0.036]**	[0.394]	[0.052]*	[0.861]	[0.442]	[0.779]
P-value RI	{0.037}**	{0.424}	{0.054}*	{0.789}	{0.410}	{0.755}
Mid-line	-0.095	0.014	0.068	-0.137	0.068	0.014
s.e.	(0.026)***	(0.014)	(0.016)***	(0.046)***	(0.036)*	(0.027)
End-line	-0.064	-0.016	0.075	-0.282	0.042	0.060
s.e.	(0.023)**	(0.009)	(0.020)***	(0.044)***	(0.049)	(0.038)
F-test of (1)=(2)	1.12	1.64	0.15	2.69	0.37	1.27
Mid-line diff in means:						
videos – control	0.094	-0.043	-0.033	-0.082	0.096	-0.025
t-test (p-value)	0.010	0.008	0.333	0.004	0.028	0.559
MHT (p-value)	0.032	0.034	0.510	0.012	0.066	0.546
End-line diff in means:						
videos – control	0.022	0.000	-0.022	-0.019	0.051	0.034
t-test (p-value)	0.525	0.993	0.519	0.104	0.249	0.447
MHT (p-value)	0.774	0.988	0.766	0.391	0.619	0.826
Observations	3,381	3,381	3,381	2,481	2,481	2,481
R-squared	0.015	0.014	0.013	0.169	0.029	0.013
Number of women	1,500	1,500	1,500	1,386	1,386	1,386

Robust standard errors (s.e.) clustered at the clinic level presented in parenthesis. P-values for t-test of parameter significance using wild bootstrapped (WB) standard errors presented in brackets (Cameron et al., 2008). Randomization inference (RI) p-values are presented in braces (Young, 2017). All specifications include women fixed effects and round dummies. Sample restricted to women who co-habit at baseline and remain co-habiting for the duration of the study. MHT presents the p-value from the Multiple Hypothesis Test of the difference in means between treatment and control group at mid-line and end-line accounting for multiple outcomes and the restriction to the sub-group of cohabiting women (List et al, 2016). *** p<0.01, ** p<0.05, *p<0.

Table 9: Health and education

	(1) Sick	(2) % Child Sick	(3) % Child Absent School	(4) Child Absent - School Fees	(5) Child Absent - Sick
Eval x videos	-0.096	-0.076	-0.164	-0.201	-0.031
s.e.	(0.029)***	(0.025)***	(0.043)***	(0.039)***	(0.037)
P-value WB s.e.	[0.004]***	[0.016]**	[0.004]***	[0.002]***	[0.455]
P-value RI	{0.008}***	{0.014}**	{0.001}***	{0.003}***	{0.487}
Evaluation	0.102	0.023	0.039	0.029	-0.040
s.e.	(0.022)***	(0.017)	(0.031)	(0.017)	(0.025)
Baseline mean control	0.270	0.100	0.359	0.298	0.216
End-line diff in means:					
video – control	-0.048	-0.031	-0.012	-0.045	0.010
t-test (p-value)	0.063	0.032	0.693	0.129	0.697
MHT (p-value)	0.541	0.128	0.901	0.286	0.704
Observations	3,967	3,367	2,943	2,981	2,965
R-squared	0.010	0.012	0.029	0.029	0.008
Number of women	1,502	1,375	1,275	1,285	1,285

Robust standard errors (s.e.) clustered at the clinic level presented in parenthesis. P-values for t-test of parameter significance using wild bootstrapped (WB) standard errors presented in brackets (Cameron et al., 2008). Randomization inference (RI) p-values are presented in braces (Young, 2017). All specifications include women fixed effects and round dummies. Sample in columns (2) to (5) restricted to women with children. Sample in columns (2) to (5) restricted to women with children. MHT presents the p-value from the Multiple Hypothesis Test of the difference in means between treatment and control group at end-line accounting for multiple outcomes and the restriction to the sub-group of households with children in columns (2) to (5) (List et al, 2016). *** p<0.01, ** p<0.05, *p<0.1

Table 10: Health and education - supplementary

	(1) Sick	(2) % Child Sick	(3) % Child Absent School	(4) Child Absent - School Fees	(5) Child Absent - Sick
Mid-line x videos	-0.148	-0.090***	-0.200***	-0.252***	-0.067
s.e.	(0.026)***	(0.023)	(0.052)	(0.039)	(0.040)
P-value WB s.e.	[0.002]***	[0.002]***	[0.006]***	[0.002]***	[0.186]
P-value RI	{0.000}***	{0.011}**	{0.000}***	{0.000}***	{0.191}
End-line x videos	-0.035	-0.060*	-0.123**	-0.144**	0.010
s.e.	(0.047)	(0.031)	(0.046)	(0.051)	(0.042)
P-value WB s.e.	[0.473]	[0.082]*	[0.026]**	[0.002]***	[0.811]
P-value RI	{0.520}	{0.083}*	{0.012}**	{0.026}**	{0.835}
Mid-line	0.128***	0.029*	0.056	0.053***	-0.023
s.e.	(0.016)	(0.016)	(0.036)	(0.013)	(0.027)
End-line	0.039	0.019	0.119***	0.002	-0.052*
s.e.	(0.035)	(0.023)	(0.020)	(0.037)	(0.027)
F-test of (1)=(2)	5.88**	2.05	2.37	6.42**	5.07**
Mid-line diff in means:					
videos – control	-0.153	-0.067	-0.101	-0.174	-0.059
t-test (p-value)	0.000	0.000	0.000	0.000	0.010
MHT (p-value)	0.000	0.000	0.000	0.000	0.008
Observations	3,967	3,367	2,943	2,981	2,965
R-squared	0.013	0.013	0.031	0.033	0.010
Number of women	1,502	1,375	1,275	1,285	1,285

Robust standard errors (s.e.) clustered at the clinic level presented in parenthesis. P-values for t-test of parameter significance using wild bootstrapped (WB) standard errors presented in brackets (Cameron et al., 2008). Randomization inference (RI) p-values are presented in braces (Young, 2017). All specifications include women fixed effects and round dummies. Sample in columns (2) to (5) restricted to women with children. MHT presents the p-value from the Multiple Hypothesis Test of the difference in means between treatment and control group at mid-line accounting for multiple outcomes and the restriction to the sub-group of households with children in columns (2) to (5) (List et al, 2016). *** p<0.01, ** p<0.05, *p<0.1

Table 11: Food expenditure, savings and credit

	(1) Food expenditure	(2) Formal saving	(3) Informal savings	(4) Formal credit	(5) Informal credit
Eval x videos	0.103	-0.099	1.359	0.022	0.208
s.e.	(0.133)	(0.465)	(0.583)**	(0.426)	(0.355)
P-value WB s.e.	[0.487]	[0.861]	[0.042]**	[0.941]	[0.523]
P-value RI	{0.509}	{0.837}	{0.028}**	{0.964}	{0.502}
Evaluation	-0.263	-1.432	2.648	-1.288	0.842
s.e.	(0.136)*	(0.232)***	(0.539)***	(0.224)***	(0.199)***
Baseline mean control	9.470	2.479	0.770	1.734	0.722
End-line diff in means:					
video – control	-0.209	0.281	1.132	-0.103	-0.161
t-test (p-value)	0.061	0.165	0.000	0.428	0.491
MHT (p-value)	0.596	0.890	0.007	0.990	0.989
Observations	3,942	3,948	3,943	3,944	3,941
R-squared	0.005	0.052	0.235	0.067	0.028
Number of women	1,500	1,501	1,502	1,501	1,500

Robust standard errors (s.e.) clustered at the clinic level presented in parenthesis. P-values for t-test of parameter significance using wild bootstrapped (WB) standard errors presented in brackets (Cameron et al., 2008). Randomization inference (RI) p-values are presented in braces (Young, 2017). All specifications include women fixed effects and round dummies. MHT presents the p-value from the Multiple Hypothesis Test of the difference in means between treatment and control group at end-line accounting for multiple outcomes (List et al, 2016). *** p<0.01, ** p<0.05, *p<0.1

Appendix A[22]

Video 1: Sarah's story

My name is Sarah Nalwoga. I run my own business. This I have done, and you can do it too. No one cannot do it. With determination, you can do anything that you desire, and enjoy the benefits.

I have been in business for close to two years. Two years at the end of this year. I used to listen to women on the radio who have made it in business. In spite of all sorts of difficulties and conditions identical to my own. About my background: I was staying in Bweyogerere and my husband died from this disease. When he died, I became sick with the disease. I remained with my children. When they started me on treatment, I improved greatly. I realised I could no longer afford Bweyogerere, paying school fees or even buy food and other household items. My businesses are growing passion fruits, a piggery growing oranges and even some crop farming where I grow coco yams on some borrowed land. For fellow women things have changed and everyone must work. Every time you think of looking for hand-outs, you will wait in vain.

For me, when I heard of growing passion fruits on the radio I bought passion fruits I made juice, and took all of the seeds to the seed bed. From the nursery bed I would get my seedlings ready for planting. Yes, I was not familiar with the bed or passion fruit support structure. But I got assistance from someone who had grown passion fruits and I came up with an appropriate structure for my passion fruits. Of course there are difficulties: I have to ensure that I spray the passion fruits and spray the oranges. My pig has to feed well, and get treated whenever sick. I think if I expand my production I can penetrate large markets like Owino, Nakasero. These demand larger quantities like sacks, or 50kgs. Then it is possible to enter Kampala market. Now I am still small, large markets require more quantity of a given product. *When you choose to do something that you like, with your heart and with love nothing can fail you.*

[22] The videos are available here: video 1; video 2; video 3; video 4.

Video 2: Alice's story

My name is Kyakyo Alice. I run my own businesses. I have done this and you too can do it. I am 42 years old and my husband left me with 5 children. When my husband died I went to Virika for HIV testing where I as found positive. I was sent to Buhinga hospital where I started on HIV drugs. I have consistently used them. I am a business woman, I sell clothes in different markets, I do labour for cash, I grow and sell crops. I keep animals like goats, pigs and cows I can sell these animals for school fees. I also have a retail shop.

The start is always hard. When my husband died, he left me with ailing health. He left me with no money, and I had to find means of survival. I started to prepare pancakes to ensure support for my children. They did not have well off relatives, I had to support them all alone through some baking and labour for cash and now I have taken all my children to school. I have bought land for my children, I have bought goats, cows and pigs for them. I have even built for my children. I decided to work hard to educate my children even when I was not educated myself.

Transportation is one major hindrance to marketing in the area, for instance when I have bananas or beans to sell I have to carry them to the market to get cash. When I started working, life changed for the better. My children are in school, my children can eat, and are not lacking. They have clothes, they are not like orphans, I thank God for this.

I encourage women to take the initiative to work and not just sit and watch. Even if they are widowed like me, they will be able to care for their families and their children.

Video 3: Jovia's story

My name is Jovia Businge, I am 54 years old. What I have done, you too can do it, even better than me. My story started with women's groups, we were taught and encouraged to work hard because being widowed did not mean you were going to die soon after. We were told to be strong and look after our children and not to leave them alone because they would suffer and die. When we moved to this place, my husband died. I tried to do what I could and now I have managed to educate all my children. When my husband died I did not know he was HIV positive, I lived on and our last born is now in senior two. I look after cows, keep pigs, cultivate crops, grow beer bananas and brew local brew to get money. With the money that I got, I started a retail shop at Kicucu and now when I get some money from somewhere else, I add stock into the shop and my children are able to go to school and we also enjoy life. Buyers come to my home for pigs and cows because they know me. I do not have other sources of money. I get it from my projects to survive. I also grow some avocado fruits, I sell sacks at 40,000, 50,000. I

also have eucalyptus trees by the seasonal river. For me, I sell piglets for 50,000. If you buy a female pig within a year, you can make a lot of money. Imagine a pig can produce 9-12 piglets and for 50,000 each piglet, how much is that? With that money, could you fail to take your children to school, buy school uniforms?

Fellow women, I call upon you to work hard. I also started from Zero. I worked hard and cultivated. I buy and rear pigs, I look after chickens because from eggs alone you can buy books for your children. So, fellow women, join women's groups!

Video 4: Mugenyi's story

My name is Yayeri Mugenyi, I am 55 years old. I have managed to start and run a farm, pay school fees for my children. I am telling the rest of you, keep working! You will realize that you too can make it. Do not retreat.

Even when I was still sick I kept telling myself that if God helped me and I became better I had to start up something to make sure that I can take care of my family. Whoever came to see me and gave me money to buy milk, I would keep it and look for someone to dig for me. I would plant sweet potatoes and look after my plantation from which I would get food for my family. I take my yellow bananas to the market every Saturday and my customers for matoke, chicken and trees find me at home. For the trees, I go looking for them. Sometimes I split and collect firewood. I always sell the mature pigs and remain with the piglets. The chickens I never sell at once but keep selling some and replacing them. I am a widow. We never had a house. And myself, I never had the strength to get involved in tilling or to plant anything. I was HIV positive and a patient who could die at anytime. With God's plan I started improving greatly. Regaining my strength bit by bit and I started looking out for something I could do in order to look after my family. The start is always hard, but you just have to be patient as it's never easy. Let's say if you get a chance and you get fifty thousand it's not for buying meat and clothes or meat only. For us, we deal so much in farming, you get laborers, pay them off. They plant for you some sweet potatoes and when they mature you can take them to the market and sell them. You could get a hundred thousand. After investing the fifty thousand, this would give you something else to do. And that's how I started, working with my children. My advice to the people listening to me is that being HIV positive is not the end of the world. If you find yourself positive you can still live long into the future. My humble request to you is to take care of yourself, don't spread HIV to other people, remain with one strain of HIV and get medication. Doctors are available to help you.

Appendix B

Table B1: Poverty Incidence by region, 2015

	Percentage	Number (millions)
National Average	19.70	6.7
Central	4.7	0.4
Western	8.7	0.6
Eastern	24.5	2.5
Northern	43.7	3.1
Urban	9.1	0.7
Rural	27.2	6

Table B2: Pattern of attrition and baseline characteristics

	(1)	(2)	(3)	(4)
Treatment	0.048	0.040	0.040	0.269
	(0.090)	(0.089)	(0.083)	(0.190)
Age		-0.003	-0.003*	-0.002
		(0.002)	(0.002)	(0.003)
Number of adults		-0.010	-0.015	-0.018
		(0.013)	(0.013)	(0.019)
Number of children		-0.011	-0.009	-0.013
		(0.008)	(0.008)	(0.013)
Widowed/single		-0.002	0.014	0.037**
		(0.015)	(0.019)	(0.018)
Years diagnosed HIV		-0.011**	-0.010**	-0.006
		(0.004)	(0.004)	(0.006)
Years on ARV		-0.003	-0.004	-0.004
		(0.006)	(0.006)	(0.010)
No education		0.017	0.020	0.039
		(0.028)	(0.025)	(0.029)
Illness			0.001	0.029
			(0.027)	(0.029)
Personal income			-0.012*	-0.008
			(0.006)	(0.007)
Household income			0.001	0.000
			(0.002)	(0.004)
Waged work			-0.079*	-0.114*
			(0.038)	(0.062)
Self employed			-0.061	-0.070
			(0.039)	(0.057)
T x Age				-0.003
				(0.003)
T x Number of adults				0.004
				(0.028)
T x Number of children				0.008
				(0.015)
T x Widowed/single				-0.057
				(0.032)
T x Years diagnosed HIV				0.000
				(0.013)
T x Years on ARV				-0.008
				(0.008)
T x No education				-0.041
				(0.047)
T x Illness				-0.057
				(0.050)
T x Personal income				-0.008
				(0.011)
T x Household income				0.001
				(0.004)
T x Waged work				0.078

				(0.070)
T x Self employed				0.026
				(0.076)
Constant	0.391***	0.608***	0.769***	0.663***
	(0.072)	(0.076)	(0.107)	(0.103)
Observations	1,822	1,822	1,822	1,822
R-squared	0.002	0.023	0.037	0.045

Robust standard errors (s.e.) clustered at the clinic level presented in parenthesis. *** p<0.01, ** p<0.05, *p<0.1

Table B3: Standardized effects for continuous outcome variables

	Table 3 (3) Personal Income	Table 3 (4) Household Income	Table 3 (5) Wage Income	Table 3 (6) Crop Income	Table 3 (7) Livestock Income	Table 3 (7) Enterprise Income
Eval x videos	0.568***	0.123	-0.119	0.321**	0.261***	0.225***
s.e.	(0.100)	(0.124)	(0.102)	(0.116)	(0.060)	(0.071)
	Table 4 (1) Personal Income	Table 4 (2) Wage Income	Table 4 (3) Crop Income	Table 4 (4) Livestock Income	Table 4 (5) Enterprise Income	
Mid-line x videos	0.930***	-0.063	0.430***	0.272**	0.292***	
s.e.	(0.125)	(0.132)	(0.123)	(0.096)	(0.082)	
End-line x videos	0.146	-0.185*	0.193	0.248***	0.147*	
s.e.	(0.091)	(0.096)	(0.129)	(0.063)	(0.080)	
	Table 5 (1) Poultry units	Table 5 (2) Cow units	Table 5 (3) Goa units	Table 5 (4) Pig units		
Eval x videos	0.077*	-0.025	0.061	0.266***		
s.e.	(0.043)	(0.078)	(0.067)	(0.071)		
	Table 9 (2) % Child Sick	Table 9 (3) % Child Abs School				
Eval x videos	-0.330***	-0.372***				
s.e.	(0.107)	(0.097)				
	Table 10 (2) % Child Sick	Table 10 (3) % Child Abs School				
Mid-line x videos	-0.389***	-0.452***				
s.e.	(0.101)	(0.118)				
End-line x videos	-0.261*	-0.279**				
s.e.	(0.132)	(0.104)				
	Table 11 (1) Food expenditure	Table 11 (2) Formal saving	Table 11 (3) Informal savings	Table 11 (4) Formal credit	Table 11 (5) Informal credit	
Eval x videos	0.058	-0.026	0.273**	0.007	0.059	
s.e.	(0.075)	(0.120)	(0.117)	(0.143)	(0.100)	

Robust standard errors (s.e.) clustered at the clinic level presented in parenthesis. Continuous variables are standardized prior to estimating each specification. All specifications are otherwise identical to the specifications in the corresponding tables in the text. *** p<0.01, ** p<0.05, *p<0.1

Table B4: Livestock

	(1) Poultry units	(2) Cow units	(3) Goat units	(4) Pig units
Mid-line x videos	0.311	-0.195	0.080	0.253**
s.e.	(0.415)	(0.533)	(0.203)	(0.087)
End-line x videos	1.017**	-0.046	0.242	0.267***
s.e.	(0.469)	(0.233)	(0.144)	(0.061)
Mid-line	0.511*	-0.005	-0.055	-0.000
s.e.	(0.280)	(0.071)	(0.078)	(0.021)
End-line	0.126	-0.071	-0.006	0.021
s.e.	(0.352)	(0.046)	(0.059)	(0.032)
Observations	3,980	3,980	3,980	3,980
R-squared	0.005	0.000	0.002	0.024
Number of pid	1,502	1,502	1,502	1,502

Robust standard errors (s.e.) clustered at the clinic level presented in parenthesis. All specifications include women fixed effects and round dummies. *** p<0.01, ** p<0.05, *p<0.1

Table B5: Lee (2005) bounds for continuous income variables

	(1) Lower	(2) Actual	(3) Upper
Personal Income	1.083***	1.580***	1.682***
	(0.250)	(0.278)	(0.287)
Observations	3,638	3,705	3,638
% trimmed mid-line	10.40		
% trimmed end-line	3.88		
Household Income	0.563	0.647	0.789
	(0.655)	(0.653)	(0.648)
Observations	3,722	3,752	3,722
% trimmed mid-line	4.70		
% trimmed end-line	1.11		
Wage Income	-0.659	-0.622	-0.521
	(0.529)	(0.532)	(0.524)
Observations	3,916	3,941	3,916
% trimmed mid-line	3.78		
% trimmed end-line	2.38		
Crop Income	1.516**	1.585**	1.686**
	(0.580)	(0.574)	(0.573)
Observations	3,915	3,941	3,915
% trimmed mid-line	3.93		
% trimmed end-line	1.87		
Livestock Income	0.882***	0.901***	1.001***
	(0.205)	(0.207)	(0.204)
Observations	3,925	3,943	3,925
% trimmed mid-line	2.74		
% trimmed end-line	1.53		
Enterprise Income	1.003***	1.035***	1.104***
	(0.326)	(0.328)	(0.332)
Observations	3,924	3,946	3,924
% trimmed mid-line	3.34		
% trimmed end-line	1.53		

Robust standard errors (s.e.) clustered at the clinic level presented in parenthesis. All specifications include women fixed effects and round dummies. *** p<0.01, ** p<0.05, *p<0.1

Table B6: Treatment effects excluding mid-line evaluation

Panel A: Comparable to Table 3

	(1) Self employed	(2) Waged work	(3) Personal income	(4) Household income	(5) Wage income	(6) Crop income	(7) Livestock income	(8) Enterprise income
Treatment	0.125	-0.093	0.391	0.515	-0.967*	0.952	0.892***	0.703*
	(0.075)	(0.092)	(0.228)	(0.803)	(0.511)	(0.658)	(0.237)	(0.394)
Obs	2,663	2,663	2,491	2,527	2,642	2,643	2,643	2,648
Women	1,501	1,501	1,467	1,468	1,492	1,501	1,501	1,500

Panel B: Comparable to Table 5

	(1) Poultry	(2) Cow	(3) Goat	(4) Pig
Treatment	0.884*	0.144	0.241**	0.240***
	(0.468)	(0.122)	(0.112)	(0.058)
Obs	2,669	2,669	2,669	2,669
Women	1,502	1,502	1,502	1,502

Panel C: Comparable to Table 7

	(1) Personal income alone	(2) Personal income husband	(3) Personal income joint	(4) Household income alone	(5) Household income husband	(6) Household income joint
Treatment	0.078*	-0.012	-0.062*	0.001	0.059	-0.021
	(0.039)	(0.014)	(0.031)	(0.063)	(0.067)	(0.053)
Obs	2,422	2,422	2,422	1,821	1,821	1,821
Women	1,493	1,493	1,493	1,325	1,325	1,325

Panel D: Comparable to Table 9

	(1) Sick	(2) % Child Sick	(3) % Child Absent School	(4) Child Absent – School fees	(5) Child Absent - Sick
Treatment	-0.049	-0.066*	-0.128**	-0.162***	0.019
	(0.054)	(0.035)	(0.055)	(0.052)	(0.042)
Obs	2,443	2,077	1,816	1,844	1,830
Women	1,499	1,318	1,187	1,200	1,196

Panel E: Comparable to Table 11

	(1) Food expenditure	(2) Formal savings	(3) Informal savings	(4) Formal credit	(5) Informal credit
Treatment	-0.041	0.282	0.843*	0.031	-0.348
	(0.130)	(0.589)	(0.426)	(0.555)	(0.472)
Obs	2,428	2,431	2,427	2,431	2,429
Women	1,496	1,496	1,498	1,496	1,495

Robust standard errors (s.e.) clustered at the clinic level presented in parenthesis. All specifications include women fixed effects and round dummies. *** p<0.01, ** p<0.05, *p<0.1

Table B7: Treatment effects mid-line to end-line

Panel A: Equivalent to Table 3

	(1) Self employed	(2) Waged work	(3) Personal income	(4) Household income	(5) Wage income	(6) Crop income	(7) Livestock income	(8) Enterprise income
Treatment	0.001	-0.024	-2.301***	0.214	-0.645	-1.174**	-0.100	-0.738
	(0.036)	(0.036)	(0.258)	(0.407)	(0.611)	(0.536)	(0.457)	(0.452)
Obs	2,472	2,474	2,294	2,334	2,454	2,454	2,456	2,454
Women	1,500	1,501	1,421	1,448	1,489	1,492	1,491	1,493

Panel B: Equivalent to Table 5

	(1) Poultry	(2) Cow	(3) Goat	(4) Pig
Treatment	1.121*	-0.104	0.132	0.044
	(0.577)	(0.148)	(0.087)	(0.060)
Obs	2,478	2,478	2,478	2,478
Women	1,502	1,502	1,502	1,502

Panel C: Equivalent to Table 7

	(1) Personal income alone	(2) Personal income husband	(3) Personal income joint	(4) Household income alone	(5) Household income husband	(6) Household income joint
Treatment	-0.034	0.018	0.009	0.057	-0.051	0.077
	(0.037)	(0.014)	(0.036)	(0.049)	(0.117)	(0.093)
Obs	1,901	1,901	1,901	1,236	1,236	1,236
Women	1,249	1,249	1,249	897	897	897

Equivalent to Table 9

	(1) Sick	(2) % Child Sick	(3) % Child Absent School	(4) Child Absent – School fees	(5) Child Absent - Sick
Treatment	0.145**	0.020	0.060	0.087	0.087*
	(0.050)	(0.022)	(0.059)	(0.053)	(0.045)
Obs	1,985	1,704	1,509	1,523	1,524
Women	1,274	1,110	997	1,008	1,007

Equivalent to Table 11

	(1) Food expenditure	(2) Formal savings	(3) Informal savings	(4) Formal credit	(5) Informal credit
Treatment	-0.032	1.425***	-0.965	0.529**	-0.722
	(0.238)	(0.379)	(0.654)	(0.239)	(0.491)
Obs	1,969	1,970	1,974	1,975	1,972
Women	1,265	1,265	1,270	1,270	1,266

Robust standard errors (s.e.) clustered at the clinic level presented in parenthesis. All specifications include women fixed effects and round dummies. *** p<0.01, ** p<0.05, *p<0.1