HIV status, role models and attainable goals: Experimental evidence on inspiring women in Uganda*

Patrick Lubega, Frances Nakakawa, Gaia Narciso, Carol Newman and Cissy Kityo

Abstract

How to inspire behavioral change among marginalized groups has become a focus of recent development programs. This paper presents the results of a randomized control trial designed to test the impact of role models on the livelihoods of women living with HIV in Uganda. Participants in our treatment group were exposed to the screening of videos of role models telling their personal stories of the challenges and rewards of setting up a business. The role models intervention has a positive effect on the probability of starting a business and on informal savings. The intervention also improves the health of women and children and reduces the probability that children are absent from school in the short run. Two potential channels are explored: an inspirational channel whereby the role models remove the stigma associated with living with HIV and a training channel.

Key Words: Role models, stigma, RCT, HIV.

JEL codes: D03, I15, I3

---

*Patrick Lubega is at Makerere University (e-mail: patlubega@yahoo.com). Frances Nakakawa is at Makerere University (e-mail: francesnm@yahoo.com). Gaia Narciso (corresponding author) is at Trinity College Dublin and TIME (Trinity Impact Evaluation Unit) (e-mail: narcisog@tcd.ie). Carol

Newman is at Trinity College Dublin and TIME (Trinity Impact Evaluation Unit) (e-mail: cnewman@tcd.ie). Cissy Kityo is at the Joint Clinical Research Centre, Uganda (e-mail: ckityo@jcrc.org.ug). This research is part of the NOURISH project which was funded by Irish Aid in partnership with the Higher Education Authority of Ireland under their Programme for Strategic Cooperation. We are grateful to a large number of people for their valuable comments and insights and partnership in the implementation of this study. These include Nazarius Mbona Tumwesigye, Archileo Kaaya and Gaston Tumuhimbise, Martina Hennessy, Fiona Lithander, Joe Barry, Ceppi Marry, Sarah Glavey and Sara O'Reilly, Fiona Kalinda and Christine Karungi and a large team of research assistants who took part in the fieldwork component of this project. Our thanks also to the NOURISH scientific advisory team, Kjetil Bjorvatn and Jakob Svensson, to Nava Ashraf, Andrea Guariso, Fadi Hassan, Martina Kirchberger, Tara Mitchell and seminar participants at Trinity College Dublin, NHH, Stockholm School of Economics (SITE), Advances with Field Experiment (University of Chicago) 2016, and CSAE (University of Oxford) 2017. The authors are indebted to Tom Burke (Broadstone Films) who directed the videos and Aisling Calt for the video editing. This paper was previously circulated under the title "Inspiring women: Experimental evidence on sharing entrepreneurial skills in rural Uganda". The RCT was registered on the AEA RCT Registry on July 2014 (AEARCTR-0000447).

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.[1] People living with HIV 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, the stigma associated with HIV prevents individuals from testing (Thornton, 2008, Turan et al. 2011), seeking treatment (Dlamini et al. 2009), disclosing their HIV status (Abdool Karim et al. 2008) and achieving their ambitions and goals in life for fear of rejection (NAFOPHANU, 2013). HIV-positive women in particular are often excluded from fully participating in society due to the significant social stigma (Canning, 2006). According to Earnshaw and Chaudoir (2009), one of the components of stigma associated with HIV consists of the negative beliefs that HIV-positive individuals have about themselves (*internalized stigma*).[2]

[1] A/RES/70/1 resolution '*Transforming our world: the 2030 Agenda for Sustainable Development*' adopted by the United Nations General Assembly on 25th September 2015 in New York.

[2] According to Earnshaw and Chaudoir (2009), stigma associated to HIV consists of three components: 1) enacted stigma, i.e. discrimination experienced by HIV-positive individuals; 2) anticipated stigma, i.e. the degree of discrimination that individuals living with HIV expect to face in the future; 3) internalized stigma. How to inspire behavioral change among marginalized groups has become a focus of recent development programs. The 2015 World Development Report (World

In this paper, we explore whether women living with HIV can overcome the internalized stigma and realize their capabilities, thus improving their economic outcomes. Using a randomized controlled trial, we examine whether HIV-positive role models can impact on the way in which HIV-positive women 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. Ultimately, the scope of the intervention is to lessen the extent of the internalized stigma and inspire HIV-positive women to attain achievable goals.

Participants in the project were randomly selected among HIV-positive women attending health clinics in Uganda. Randomization into treatment took place at clinic level. Over the course of a year, patients in treated clinics were invited to the screening of four videos 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 her HIV-status to the challenges and rewards from setting up her own business. Each video ends with a final message, which aims to communicate strongly to viewers that these achievements are possible for them too. A group

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.

discussion took place during and after the video screening, which was led by the fieldwork team.

We provide evidence that viewing the videos increases the probability of running a business by 12.5 percentage points one year after the start of the interventions. Exposure to the role models also leads to an initial increase in income from crops and livestock, and non-agricultural enterprises, and changes the composition of income-generating activities of women over the medium-term. Moreover, the videos are found to lead to better health among women and their children and to lower the proportion of children absent from school in the short-run. This is likely due to a combination of higher incomes in the short-term and a direct effect through some of the messages contained in the videos regarding health and compliance with ARV treatment. Finally, women in the treatment group save more, with the higher level of savings accounting for around half of the increase in incomes in the treatment group at mid-line. These findings suggest that this simple, cost-effective and easily scalable intervention could have long-term effects. Our results show that providing HIV-positive 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 overcome their internalized stigma related to HIV and 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 inspirational channel, we find that women are more ambitious and exercise more control over their personal resources suggesting that the role models are empowering for women in the short-term, In relation to the training channel, we provide evidence that the new businesses started by the women in treated clinics are similar to those of the role models, hence supporting the video's training role.

Our paper contributes to the emerging literature that examines the use of media and entertainment for achieving development goals.[3] 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 school 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

[3] 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.

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.[4] 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 two 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 internalized stigma associated with

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

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 if role models are just marginally more successful, there can be significant effects.[5] Bernard et al.'s (2014) role models stress the importance of the support of elders, extension officers and advisors. For women living with HIV this can be problematic as they often do not have access to these services and supports, due to the external stigma related to HIV. Our role models identify hardships that they encountered which makes our subjects relate to them.

Finally, this paper also speaks to the recent literature that highlights the role of peer-learning and targeted teaching in achieving results in relation to entrepreneurial training and financial decisions in developing countries (Nguyen, 2008; Lafortune et. al., 2018; Bursztyn et. al., 2014). Indeed, the videos are not just motivational but also convey practical information. We find evidence that the information the inspiring women provide in the videos is taken on board by the

[5] 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.

participants in relation to their economic activities. This suggests that role models could be used not only as a tool for inspiring individuals but also as an 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, while section 5 discusses the robustness checks. Finally, Section 6 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).[6] A health centre III facility is located at

[6] 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,

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 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, 2010)

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.[7] 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

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.

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

group. The fieldwork team set appointments for a three-day visit in each clinic.[8] 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 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 132 patients were recruited in each clinic (Figure 1). Crucially, appointments with the fieldwork team for the subsequent intervention/interview rounds were made to coincide with

[8] 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 participants' routine medical appointments, so as to lower potential attrition and avoid unnecessary travelling for the purpose of administering the survey.[9]

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 her own business. A group discussion took place during and after the video screening. Participants were divided into groups, as they arrived for their visit at the health clinic.[10] For each group, the video was shown a first time, with interruptions of 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. The video was then shown one more time to the same group of participants, but without any interruption. A group discussion moderated by the fieldwork leader followed the second screening of the video.

[9] 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.

[10] Up to three groups per day were formed. Each group would consist of a maximum of 25 women.

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.[11] 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. 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.[12]

The videos were shot exclusively for the purpose of this project and they all featured the same structure: a) background information and HIV status disclosure;[13] b) description of how the business was started; c) discussion of the challenges

[11] The casting did not involve any of the women or clinics included in our sample.

[12] Filming took place in October 2014 by director Tom Burke of Broadstone Films, an Irish-based video production company. The videos can be accessed at the following links: https://vimeo.com/139188803; https://vimeo.com/126591023; https://vimeo.com/126597793; https://vimeo.com/126894420.

[13] 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.

faced; d) targets for the future; e) final inspirational message.[14] 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.[15] 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.

[14] 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 Section A of the Online Appendix.

[15] The order of the videos was decided by the authors on the basis of the interviews' content.

The first intervention round took place between October and December 2014 and each clinic was visited for two days (Figure 1). 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.[16] 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. Finally, the end-line evaluation was administered between September and December 2015.

[Insert Figure 1 here]

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

[16] 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.

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 visit, 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.

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.

$$O_{it} = \alpha + \delta Video_i + \gamma O_{i0} + \boldsymbol{\beta}\mathbf{X}_{i0} + \theta Region_i + \varepsilon_{it} \quad (1)$$

where O_{it} is the particular outcome variable of interest for woman *i* at either mid-line or end-line; $Video_i$ is a dummy indicator for whether woman *i* is in a treatment clinic; O_{i0} is the value of the outcome variable at baseline; $\mathbf{X}_{i0}$ is a vector of baseline characteristics; and $Region_i$ is an indicator for the region where the clinic is

located, which were the strata used for the randomization. Standard errors are clustered at the clinic level in the main specification. 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 account for the sample stratification and 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. Our sample is reasonably balanced across the treatment and control groups on most of the demographic characteristics with the exception that participants in the control group tend to be 1 year older than participants in the treatment group.

We achieve balance across many outcome variables but there are some statistically significant differences that warrant mention. It should be noted that in all cases, they work against us finding an effect. In terms of income and livelihoods, we find that women have 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. We find that women in the treatment

group are more likely to have children that are absent from school as a result of not being able to pay school fees. This suggests that women in the treatment group are on average slightly worse off than the control group.

The second is an indicator of empowerment for which we use a measure of intra-household bargaining power. Respondents are asked whether they alone are responsible for decisions relating to income in the household (their own personal income and other household income), or whether this is the joint responsibility of them and their spouse, or the responsibility of their spouse alone. We construct a binary indicator which takes a value of one if the respondent alone has control over any income within the household. We restrict our sample to women who, at baseline, co-habit with a partner. A higher percentage of participants in the control group are empowered at baseline on the basis of our measure. This works against us finding an effect of the intervention on this outcome.

P-values presented in Table 1 are based on standard t-tests. We also use Multiple Hypothesis Testing (MHT) procedures, which lead 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 and a higher percentage of participants in the control group report that they take decisions about individual income levels.

[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 majority of women who left the study did so between the baseline and the first intervention, while there was very little attrition between intervention/evaluation rounds. The attrition rate between the baseline and the mid-line was 38%, while the attrition rate between the mid-line and the end-line was 16%.

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.

Nevertheless, attrition could still be 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 Table B2 of the Online Appendix. 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, incomes from crops and enterprises and the probability of operating an enterprise. 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 are almost no differences between the treatment and the control group in the baseline

characteristics of attriters.[17] 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 attriters (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

4.1 Estimation results

The first set of outcomes we consider captures the extent to which we observe behavioral change in relation to enterprise activities and income as a result of the intervention. Table 3 presents the results for the impact of the treatment on the probability of operating an enterprise and incomes generated from enterprises, estimated using the specification in equation (1). We present the results separately

[17] This is demonstrated by the interactions between the treatment indicator and the baseline characteristics in Table B2 in the Online Appendix. Two exceptions are that that in the treatment group women that drop out of the sample have a higher proportion of children absent from school (marginally statistically significant) and save more.

for mid-line and end-line. 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.[18]

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. We find that women in treatment clinics are more likely to operate an enterprise (columns 1 and 2) at both mid-line and end-line, in accordance with the message of the videos, which highlights the stories of women running their own business enterprises.[19] The effect is sizable with women in the treatment clinics 13.9 percentage points at mid-line, and 12.5 percentage point at end-line, more likely to operate an enterprise as a result of the intervention than women in the control group. This finding provides evidence

[18] 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).

[19] We do not find any specific pattern in the type of new enterprise set up by participants in the treatment group in terms of industry.

that exposure to role models has a positive impact on the probability of operating a business.

In columns 3 to 10 of Table 3 we report the impact of the videos treatment on the personal income earned by the woman (excluding income generated by others in the household) and income from different enterprise activities, namely crops, livestock and non-agricultural enterprises.[20] 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 the treatment to impact on income generated from these activities. The videos were effective in increasing total income and incomes from all three enterprise activities at mid-line.[21] The magnitude of the effects is large. Relative to the mean level of income in the control group at baseline, total personal incomes of women in the treatment clinics are 68 per cent higher than women in the control group at mid-line, while crop income, livestock income and non-agricultural

[20] Income variables are trimmed for outliers in the top 1 percentile of the income distribution.

[21] We also examine the impact of the intervention on other household income and income from waged employment. We find no statistically significant difference between the treatment and the control group on either measure. This is to be expected given that: 1) it is only women's personal economic activities that are the subject matter of the videos and so we would not expect the income levels of other household members to be affected; and 2) the message contained in the videos targets enterprise activity and not waged employment.

incomes are 79, 82 and 92 per cent higher, respectively. Standardizing the effect yields a standardized coefficient of 0.664 for total personal income, 0.435 for crop income, 0.216 for livestock income and 0.289 for non-agricultural enterprise income. The standardized coefficients are reported in Table B3 of the Online Appendix. At end-line, we find no statistically significant difference between the incomes of women in the treatment group and those in the control group. This is due to a convergence in the income levels of women in the control group with those in the treatment group and not a decline in the income levels of the treatment group. It is interesting to note that the composition of income is different at end-line between the treatment and control groups. Table 4 shows that women in the treatment clinics earn a greater proportion of their income from enterprise activities at mid-line and end-line. They also spend more time working in enterprise activities than the control group. The control group, in contrast, earn a greater proportion of their income from waged employment.

In sum, while our results show a large and significant effect of the role models videos on operating an enterprise at mid-line and end-line, the effect on incomes generated from these activities is only evident at mid-line. What we can conclude from our analysis, is that the videos treatment certainly initiated new enterprise activities, changed the composition of income generating activities that the women are engaged in, and generated higher levels of incomes from these activities, at least in the short-term. This suggests that providing vulnerable women with role models

that empower them to start their own enterprise activities can lead to behavioral change. The effectiveness of such an intervention in improving objectively-measured welfare outcomes, namely income, in the longer term is questionable. While analyzing the effect on long-term outcomes is beyond the scope of this study, in what follows we explore the underlying mechanisms at work which help to shed some light on potential reasons why the effects on income are only evident in the short-term.

[Insert Table 3 here]

[Insert Table 4 here]

4.2 Mechanisms

As discussed in the introduction, two mechanisms might be at play. First, role models provide inspiration which empowers women and helps them in overcoming the stigma associated with living with HIV; second, the videos perform a training function, providing participants with information that they may need to set up their own business.

To explore the first mechanism, the inspirational channel, in Table 5, we present the results of the impact of the role models on two indicators. The first is an indicator of ambition which we measure by asking respondents whether or not they agree or disagree with the statement '*If I try hard, I can improve my situation in life*'. We construct a binary variable that takes on a value of one of respondents 'strongly agree' with this statement. The second is an indicator of empowerment

which takes on a value of one when respondents report that they alone are responsible for decisions relating to income in the household (their own personal income and other household income). For the latter measure we restrict our sample to women who, at baseline, co-habit with a partner.

[Insert Table 5 here]

We do not have a measure of ambition at baseline but rely on a measure collected during the first round of video screening and data collection. At this time ambition levels were already significantly higher in the treatment group compared to the control group. Even when we control for this difference in column (2) we find that the video campaign impacts positively on ambition levels at mid-line with women in the treatment clinics 11.7 per cent more likely to be ambitious on the basis of our measure. We also find a positive effect at end-line, which is lower in magnitude and less precisely estimated on the basis of the wild bootstrap and randomization inference p-values. We find that the video campaign also impacts positively on the empowerment of women at mid-line. While the effect on empowerment also remains positive at end-line, the difference between the treatment and the control group is less precisely estimated. This suggests that, at least in the short-term, a possible mechanism through which the role models' videos lead to women starting new enterprises, and generating incomes from these enterprises, is through helping them overcome the stigma associated with living with HIV leading them to be more ambitious and empowered. One possible explanation is that the videos may provide

an initial boost in ambition and empowerment that inspires women to start new enterprises. While their reported levels of ambition and empowerment are no different than those of the control group by end-line, the enterprises that they initiated remain.

To explore the second mechanism, 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 6 explores the changes in the portfolio of livestock. Women in the treated clinics are found to increase the number of pig units at mid-line and end-line and the number of poultry units at end-line. This is indeed in line with the message in the videos: the third and fourth videos, which were screened after the mid-line but before the end-line, 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*"). Pig rearing is mentioned across all four videos; for example, 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?*"). Women in treated clinics also produce

more goat units than those in control clinics at both mid-line and end-line. Goats are mentioned in the first video and most of the videos feature images of goats.

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 columns (9) and (10) of 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 coefficient for the impact of the treatment at end-line is positive but is not well determined. These results suggest that the participants act upon the information included in the videos and so they may perform a training function which impacts on the types of enterprises that they operate.

Considering the two mechanisms together, our results suggest that the inspirational channel is initially important, with the videos reducing internalized stigma, boosting ambition and empowering women. This contributes to women's decisions to start new enterprise activities. The types of enterprises that they start are influenced by the content of the videos suggesting that they also perform a training function. While the inspirational channel appears to dissipate over time,

the effect of the training channel appears to persist with treated women continuing to rear more livestock and operate enterprises at end-line.

[Insert Table 6 here]

4.3 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 their HIV status. 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. In Table 7 we explore the impact of the intervention on the health of the women and children and on children's education. At mid-line, 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 more than 15 percentage points.[22] Even more interestingly, the percentage of children that are

[22] 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.

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. At end-line, women in videos clinic also report fewer days of sickness but the effect is not well determined. The effect on the percentage of children that are sick, however, persists. This provides suggestive evidence for the latter channel given that at end-line, we find no statistically significant difference in the income levels of women in the video clinics.

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. In particular, a lower proportion of children are absent from school because of the inability to pay school fees.[23] These effects, however, are not present at end-line, which is not surprising given that the ability to pay school fees depends on income levels which by end-line have equalized with the control group.

[Insert Table 7 here]

[23] We find no evidence of the treatment having an impact on the probability of not attending school due to sickness (result not shown but available on request).

Finally, Table 8 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 8: women in the treatment group are found to have more informal savings at mid-line and end-line (columns 5 and 6), while no effect is found for formal savings or credit. We find that the informal savings are 20,170 shillings (approximately 5.4 USD) higher at mid-line and 17,559 shillings (approximately 4.7 USD) higher at end-line in the treatment group compared to the control group. The standardized effect at mid-line is 0.304 and at end-line is 0.265 (see Table B3 in the Online Appendix). At mid-line this accounts for around half of the increase in total personal incomes. The fact that savings are also higher at end-line, when total income levels between the treatment and control groups have equalized, is suggestive of more forward-looking behavior as a result of the videos intervention which could lead to future investments in business activities.[24]

[Insert Table 8 here]

[24] 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.

5. Robustness checks

5.1 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, in our case we must assume that there are some women in the control group that would have attrited if they had been assigned to the treatment group, but there are 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 the observations at zero that are trimmed.

The results are presented in Table B4 in the Online Appendix which also illustrates the proportion of observations trimmed at mid-line and end-line in the control group for each income variable. The results reveal quite tight lower bounds around our point estimates but in some cases wide upper bounds. This implies that if the highest income households were trimmed from the control group, our estimates would be even more pronounced in magnitude at mid-line, and would be much larger at end-line. This suggests that our results could be considered a lower bound to the potential impact of the videos intervention on incomes.

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. The results are presented in Section C of the Online Appendix (Tables C1-C6).

5.2 Robustness to experimenter demand effects

Experimenter demand effects are also a possibility for two reasons. First, it might be possible that enumerators had more interaction with the women in the treatment 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 than at the end-line evaluation, which took place three months after the last intervention. Indeed, the impact on outcomes is less pronounced at end-line compared with the mid-line in all cases. While we cannot rule out that the large magnitude of the effects at mid-line are not in part due to experimenter demand effects there are reasons to believe that they are not driving the results. First, it is unlikely that misreporting would be observed across the full range of outcomes of interest, in particular the secondary outcomes that are not directly related to the videos. Second, as a check on the likelihood that there are experimenter demand effects of this kind we use information on other types of behavior, not related to our outcomes of interest, that women in the treated clinics might misreport if they were trying to please the enumerators. We asked women at baseline and mid-line whether they wash their hands before preparing meals, before eating, before feeding children and after using the toilet. If there are experimenter demand effects we might expect to see more women in the treated clinics reporting that they wash their hands at these times. This, however, is not the case as the results

in Table B5 of the Online Appendix show. This suggests that experimenter demand effects are not of too much concern in our analysis.

6. 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, the proportion of income generated from enterprise activities and the types of enterprise activities that women engage in. We provide evidence of two channels at work: an inspirational channel which empowers women and encourages them to be more ambitious, at least in the short run, leading them to take the initiative and start new businesses; and an information channel, whereby women learn from the content of the videos and change their behavior accordingly. The intervention also improves the health of women and children and reduces the

probability that children are absent from school in the short run. Moreover, we find a positive impact of the role models intervention on the informal savings of women.

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.

References

Abdool Karim, Q. Meyer-Weitz, A., Mboyi, L., Carrara, H. Mahlase, G., Frohlich J. A. and Abdool Karim, S., 2008. "The influence of AIDS stigma and discrimination and social cohesion on HIV testing and willingness to disclose HIV in rural KwaZulu-Natal, South Africa," *Global Public Health*, 3(4), pages 351-365,

Bandiera, O., Burgess, R., Das, N., Gulesci, S., Rasul, I. and Sulaiman, M., 2017. "Markets and poverty in village economies." *Quarterly Journal of Economics*, 132(2), pages 811-870.

Banerjee, A.V. and Duflo, E., 2008. "What is middle class about the middle classes around the world?." *The Journal of Economic Perspectives*, 22(2), pages 3-41A.

Banerjee, A., E. La Ferrara and V. Orozco (2017), "The Entertaining Way to Behavioral Change", mimeo, Bocconi University.

Beaman, L., R. Chattopadhyay, E. Duflo, R. Pande and P. Topalova, 2009. "Powerful Women: Does Exposure Reduce Bias?" *The Quarterly Journal of Economics*, 124(4), pages 1497-1540.

Beaman, L., E. Duflo, R. Pande, and P. Topalova, 2012. "Female Leadership Raises Aspirations and Educational Attainment for Girls: A Policy Experiment in India." *Science Express* 12 January, 1–10.

Bernard, T., S. Dercon, K. Orkin, and A. S. Taffesse. 2014. "The Future in Mind: Aspirations and Forward-Looking Behaviour in Rural Ethiopia." Working Paper, Centre for the Study of African Economies, University of Oxford.

Bjorvatn, K., A. Cappelen, L. Sekei Helgesson E. Sørensenand Bertil Tungodden, 2015. "Teaching through television: Experimental evidence on entrepreneurship education in Tanzania," Discussion Paper Series in Economics 3/2015, Department of Economics, Norwegian School of Economics.

Bursztyn, L., F. Ederer, B. Ferman, and N. Yuchtman, 2014. "Understanding mechanisms underlying peer effects: Evidence from a field experiment on financial decisions," *Econometrica*, 82 (4), 1273–1301.

Cameron, C., Gelbach, J., and Miller, D. 2008. "Bootstrap-based improvements for inference with clustered errors." *Review of Economics and Statistics* 90(3), 414–427.

Canning, David, 2006. "The Economics of HIV/AIDS in Low-Income Countries: The Case for Prevention", *Journal of Economic Perspectives*, Volume 20, Issue 3, Pages 121-142

Cheung, Maria, (2012), Edutainment Radio, Women's Status and Primary School Participation: Evidence from Cambodia, No 2012:5, Research Papers in Economics, Stockholm University, Department of Economics.

DellaVigna, S. and E. La Ferrara, 2015. "Economic and Social Impacts of the Media," NBER Working Papers 21360, National Bureau of Economic Research,

de Mel, S., D. McKenzie and C. Woodruff. 2014. "Business training and female enterprise start-up, growth and dynamics: Experimental evidence from Sri Lanka." *Journal of Development Economics*, 106, pages 199-210.

Dlamini, P. S., Wantland, D., Makoae, L. N., Chirwa, M., Kohi, T. W., Greeff, M., Holzemer, W. L., 2009. "HIV Stigma and Missed Medications in HIV-Positive People in Five African Countries." *AIDS Patient Care and STDs*, 23(5), 377–387.

Duflo, E., 2003. "Grandmothers and granddaughters: old-age pensions and intrahousehold allocation in South Africa." *The World Bank Economic Review*, 17(1), pages 1-25.

Earnshaw, V. A., and Chaudoir, S. R.,2009. "From Conceptualizing to Measuring HIV Stigma: A Review of HIV Stigma Mechanism Measures." *AIDS and Behavior*, 13(6), pages 1160–1177.

Guyon, N., and E. Huillery. 2014. "The Aspiration-Poverty Trap: Why Do Students from Low Social Background Limit Their Ambition? Evidence from France." Working Paper, Department of Economics, Sciences Po, Paris.

Hoff, K., and P. Pandey, 2006. "Discrimination, Social Identity, and Durable Inequalities." *American Economic Review* 96 (2): 206–11.

Hoff, K., and P. Pandey, 2014. “Making Up People: The Effect of Identity on Performance in a Modernizing Society.” *Journal of Development Economics* 106: 118–31.

Kearney, Melissa S., and Phillip B. Levine. 2015. “Media Influences on Social Outcomes: The Impact of MTV's 16 and Pregnant on Teen Childbearing.” *American Economic Review*, 105(12): 3597-3632.

Jensen, R., and E. Oster. 2009. “The Power of TV: Cable Television and Women’s Status in India.” *Quarterly Journal of Economics* 124 (3): 1057–94.

La Ferrara, E. 2016. “Mass Media And Social Change: Can We Use Television To Fight Poverty?,” *Journal of the European Economic Association*, vol. 14(4), pages 791-827, 08.

La Ferrara, E., A. Chong, and S. Duryea, 2012. “Soap Operas and Fertility: Evidence from Brazil.” *American Economic Journal: Applied Economics* 4 (4): 1–31.

Lafortune, J., J. Ruitort, and J. Tessada, *forthcoming*. “Role models or individual consulting: The impact of personalizing micro-entrepreneurship training,” *American Economic Journal: Applied Economics*.

Lee, D., 2009. “Training, Wages, and Sample Selection: Estimating Sharp Bounds on Treatment Effects,” *Review of Economic Studies* 76: 1071–1102.

List, J.A., Shaikh, A.M. and Yang, X. 2016. “Multiple Hypothesis Testing in Experimental Economics.” NBER Working Paper No. 21875.

Ministry of Health, 2010. “The Second National Health Policy,” Kampala, Uganda.

NAFOPHANU, 2013. The PLHIV Stigma Index, Country Assessment, Uganda

Nguyen, T., 2008. “Information, role models and perceived returns to education: Experimental evidence from Madagascar,” Mimeo.

Ravallion, M., D. van de Walle, P. Dutta, R. Murgai, 2015. “Empowering poor people through public information? Lessons from a movie in rural India.” *Journal of Public Economics*, 132(C), pages 13-22.

Thornton, R., 2008 “The Demand for, and Impact of, Learning HIV Status Thornton, Rebecca.” *American Economic Review*, 98(5): 1829–1863.

Turan JM, Bukusi EA, Onono M, Holzemer WL, Miller S, Cohen CR, 2011. “HIV/AIDS stigma and refusal of HIV testing among pregnant women in rural Kenya: results from the MAMAS study.” *AIDS Behavior*;15(6) pages111-120.

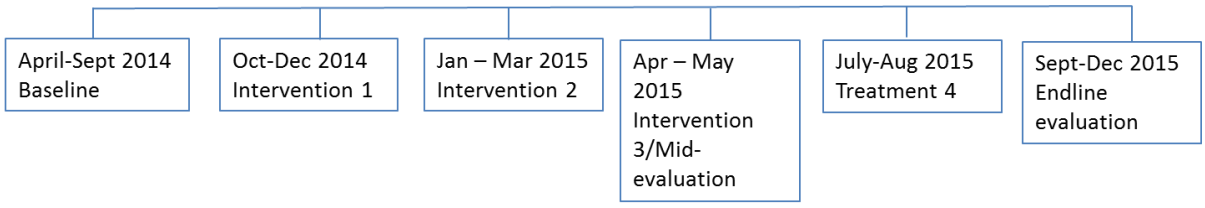
World Bank, 2015. *World Development Report: Mind, Society and Behavior*, Washington, DC.

United Nations General Assembly 2015. A/RES/70/1 “Transforming our world: the 2030 Agenda for Sustainable Development”. New York.

Young, A., 2017. “Channeling Fisher: Randomization tests and the statistical insignificance of seemingly significant experimental results.” Mimeo.

Figure

Figure 1: Timeline



Tables

Table 1: Summary statistics and balancing tests

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
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
Income and livelihoods	**Mean Control**	**Mean Video**	**Difference**	**P-value**
Total personal income	60,087	51,968	8,119	0.011
Crop income	15.926	11.914	4,012	0.019
Livestock income	3,577	2,967	610	0.372
Non agricultural income	14,765	11,096	3,668	0.078
Self-employed	0.268	0.283	-0.015	0.508
Health and children's 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
Consumption, savings and credit	**Mean Control**	**Mean Video**	**Difference**	**P-value**
Food expenditure	20,553	19,591	961	0.318
Informal savings – amount	2,671	3,635	-964	0.171
Formal savings – amount	21,583	20,317	1,266	0.724
Informal credit – amount	3,672	3,634	38	0.970
Formal credit – amount	17,047	17,914	867	0.794
Ambition and empowerment	**Mean Control**	**Mean Video**	**Difference**	**P-value**
Decisions on individual income	0.822	0.750	0.071	0.014

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: Enterprise activities and income

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Operates an enterprise		Total Personal Income		Crop Income		Livestock Income		Enterprise Income	
Mid-line										
Video	0.143*	0.139***	36,314***	40,972***	11,612***	12,659***	2,779**	2,936***	11,492**	13,531***
s.e.	(0.076)	(0.041)	(8,250)	(5,722)	(2,149)	(1,906)	(1,056)	(836)	(5,136)	(3,087)
P-value WB s.e.	[0.102]	[0.004]	[0.000]	[0.000]	[0.000]	[0.000]	[0.018]	[0.032]	[0.048]	[0.000]
P-value RI	{0.053}	{0.021}	{0.000}	{0.000}	{0.002}	{0.002}	{0.009}	{0.005}	{0.003}	{0.005}
Baseline outcome		Yes		Yes		Yes		Yes		Yes
Baseline covariates		Yes		Yes		Yes		Yes		Yes
Region dummies		Yes		Yes		Yes		Yes		Yes
Observations	1,306	1,288	1,214	1,137	1,298	1,270	1,300	1,271	1,298	1,275
R-squared	0.023	0.223	0.094	0.140	0.026	0.110	0.025	0.077	0.022	0.127
End-line										
Video	0.156**	0.125***	-198	2,940	1,755	2,919	1,320	1,334*	2,616	3,517
s.e.	(0.072)	(0.041)	(9,249)	(5,047)	(2,953)	(2,160)	(856)	(650)	(7,516)	(3,567)
P-value WB s.e.	[0.054]	[0.052]	[0.979]	[0.595]	[0.593]	[0.284]	[0.276]	[0.100]	[0.731]	[0.440]
P-value RI	{0.052}	{0.030}	{0.978}	{0.615}	{0.584}	{0.286}	{0.172}	{0.119}	{0.722}	{0.411}
Baseline outcome		Yes		Yes		Yes		Yes		Yes
Baseline covariates		Yes		Yes		Yes		Yes		Yes
Region dummies		Yes		Yes		Yes		Yes		Yes
Observations	1,166	1,150	1,080	1,014	1,156	1,130	1,156	1,130	1,156	1,137
R-squared	0.026	0.242	0.000	0.050	0.005	0.084	0.016	0.051	0.013	0.156
Baseline mean control	0.268		60,087		15,926		3,577		14,765	

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). *** p<0.01, ** p<0.05, *p<0.1

Table 4: Composition of income

	(1)	(2)	(3)	(4)
	Proportion of income from enterprises		Time use on enterprise activities	
Mid-line				
Video	0.141***	0.163***	0.825*	0.884***
s.e.	(0.040)	(0.026)	(0.431)	(0.241)
P-value WB s.e.	[0.000]	[0.000]	[0.094]	[0.008]
P-value RI	{0.002}	{0.000}	{0.057}	{0.014}
Baseline outcome		Yes		Yes
Baseline covariates		Yes		Yes
Region dummies		Yes		Yes
Observations	1,086	970	1,311	1,296
R-squared	0.027	0.151	0.025	0.227
End-line				
Video	0.121**	0.127***	0.510	0.477**
s.e.	(0.053)	(0.032)	(0.364)	(0.176)
P-value WB s.e.	[0.034]	[0.006]	[0.178]	[0.060]
P-value RI	{0.042}	{0.012}	{0.177}	{0.044}
Baseline outcome		Yes		Yes
Baseline covariates		Yes		Yes
Region dummies		Yes		Yes
Observations	1,064	949	1,167	1,155
R-squared	0.023	0.174	0.010	0.216
Baseline mean control	0.461		1.179	

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). *** p<0.01, ** p<0.05, *p<0.1

Table 5: Ambition and empowerment

	(1)	(2)	(3)	(4)
	Ambition		Income decisions	
Mid-line				
Video	0.154***	0.117***	0.123**	0.134***
s.e.	(0.047)	(0.032)	(0.050)	(0.026)
P-value WB s.e.	[0.008]	[0.008]	[0.052]	[0.004]
P-value RI	{0.000}	{0.021}	{0.005}	{0.002}
Baseline outcome		Yes		Yes
Baseline covariates		Yes		Yes
Region dummies		Yes		Yes
Observations	1,305	932	637	634
R-squared	0.018	0.039	0.017	0.063
End-line				
Video	0.112**	0.084*	0.030	0.026
s.e.	(0.044)	(0.040)	(0.036)	(0.036)
P-value WB s.e.	[0.066]	[0.110]	[0.609]	[0.505]
P-value RI	{0.048}	{0.169}	{0.4875}	{0.539}
Baseline outcome		Yes		Yes
Baseline covariates		Yes		Yes
Region dummies		Yes		Yes
Observations	1,154	847	583	581
R-squared	0.002	0.026	0.001	0.012
Baseline mean control	0.20		0.82	

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). *** p<0.01, ** p<0.05, *p<0.1

Table 6: Livestock enterprises

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Poultry units		Cow units		Goat units		Pig units		Retail	
Mid-line										
Video	0.814	0.596	0.433	0.399	0.464	0.395**	0.396**	0.357***	0.123**	0.122***
s.e.	(0.802)	(0.356)	(0.394)	(0.282)	(0.289)	(0.170)	(0.172)	(0.098)	(0.047)	(0.038)
P-value WB s.e.	[0.366]	[0.156]	[0.422]	[0.282]	[0.126]	[0.070]	[0.034]	[0.010]	[0.016]	[0.018]
P-value RI	{0.137}	{0.137}	{0.076}	{0.207}	{0.048}	{0.095}	{0.021}	{0.009}	{0.000}	{0.001}
Baseline outcome		Yes		Yes		Yes		Yes		Yes
Baseline covariates		Yes		Yes		Yes		Yes		Yes
Region dummies		Yes		Yes		Yes		Yes		Yes
Observations	1,311	1,296	1,311	1,296	1,311	1,296	1,311	1,296	1,311	1,296
R-squared	0.003	0.182	0.008	0.051	0.015	0.119	0.038	0.192	0.035	0.065
End-line										
Video	1.617*	1.286***	0.327	0.195	0.550*	0.453***	0.382**	0.318***	0.065	0.051
s.e.	(0.765)	(0.270)	(0.264)	(0.116)	(0.267)	(0.112)	(0.142)	(0.072)	(0.058)	(0.033)
P-value WB s.e.	[0.038]	[0.000]	[0.340]	[0.228]	[0.084]	[0.014]	[0.020]	[0.004]	[0.378]	[0.204]
P-value RI	{0.004}	{0.002}	{0.039}	{0.075}	{0.008}	{0.006}	{0.008}	{0.004}	{0.212}	{0.265}
Baseline outcome		Yes		Yes		Yes		Yes		Yes
Baseline covariates		Yes		Yes		Yes		Yes		Yes
Region dummies		Yes		Yes		Yes		Yes		Yes
Observations	1,167	1,155	1,167	1,155	1,167	1,155	1,167	1,155	1,167	1,155
R-squared	0.013	0.200	0.019	0.319	0.019	0.159	0.032	0.201	0.007	0.096
Baseline mean control	1.96		0.30		0.82		0.20		0.10	

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). *** p<0.01, ** p<0.05, *p<0.1

Table 7: Health and education

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Sick		% Child Sick		% Child Absent School		% Absent - School Fees	
Mid-line								
Video	-0.153***	-0.151***	-0.067***	-0.064***	-0.102**	-0.114***	-0.174***	-0.164***
s.e.	(0.039)	(0.023)	(0.010)	(0.011)	(0.040)	(0.038)	(0.044)	(0.036)
P-value WB s.e.	[0.006]	[0.002]	[0.002]	[0.002]	[0.042]	[0.030]	[0.002]	[0.004]
P-value RI	{0.005}	{0.003}	{0.000}	{0.002}	{0.036}	{0.041}	{0.000}	{0.001}
Baseline outcome		Yes		Yes		Yes		Yes
Baseline covariates		Yes		Yes		Yes		Yes
Region dummies		Yes		Yes		Yes		Yes
Observations	1,306	1,286	1,113	1,014	976	838	985	859
R-squared	0.027	0.072	0.023	0.027	0.014	0.040	0.038	0.062
End-line								
Video	-0.049	-0.052	-0.031*	-0.036***	-0.012	-0.029	-0.046	-0.041
s.e.	(0.048)	(0.031)	(0.017)	(0.012)	(0.042)	(0.041)	(0.040)	(0.034)
P-value WB s.e.	[0.324]	[0.182]	[0.100]	[0.008]	[0.779]	[0.635]	[0.304]	[0.308]
P-value RI	{0.188}	{0.205}	{0.092}	{0.043}	{0.768}	{0.592}	{0.265}	{0.312}
Baseline outcome		Yes		Yes		Yes		Yes
Baseline covariates		Yes		Yes		Yes		Yes
Region dummies		Yes		Yes		Yes		Yes
Observations	1,165	1,149	996	910	872	747	883	774
R-squared	0.003	0.044	0.005	0.024	0.000	0.058	0.003	0.055
Baseline mean control	0.27		0.10		0.36		0.30	

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). *** p<0.01, ** p<0.05, *p<0.1

Table 8: Food expenditure, savings and credit

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Food expenditure		Formal saving		Informal saving		Formal credit		Informal credit	
Mid-line										
Video	-2,746	-2,100	-3,566	-1,552	20,685***	20,170***	-3,632	-3,434	3,827	4,947
s.e.	(3,644)	(2,524)	(5,886)	(5,457)	(5,179)	(4,877)	(2,444)	(1,975)	(4,798)	(4,022)
P-value WB s.e.	[0.465]	[0.523]	[0.681]	[0.831]	[0.006]	[0.000]	[0.180]	[0.118]	[0.473]	[0.286]
P-value RI	{0.444}	{0.464}	{0.663}	{0.879}	{0.008}	{0.010}	{0.163}	{0.182}	{0.461}	{0.301}
Baseline outcome		Yes		Yes		Yes		Yes		Yes
Baseline covariates		Yes		Yes		Yes		Yes		Yes
Region dummies		Yes		Yes		Yes		Yes		Yes
Observations	1,104	1,089	1,103	1,086	1,102	1,081	1,102	1,084	1,100	1,084
R-squared	0.000	0.031	0.017	0.035	0.031	0.100	0.010	0.039	0.003	0.034
End-line										
Video	-3,108	-2,424	3,024	3,054	19,669*	17,559**	-2,495	-3,781**	-1,631	-572
s.e.	(4,114)	(1,912)	(4,308)	(3,297)	(9,949)	(7,822)	(1,931)	(1,765)	(6,385)	(3,466)
P-value WB s.e.	[0.489]	[0.316]	[0.537]	[0.511]	[0.058]	[0.098]	[0.226]	[0.086]	[0.775]	[0.865]
P-value RI	{0.388}	{0.345}	{0.565}	{0.556}	{0.045}	{0.051}	{0.234}	{0.072}	{0.737}	{0.876}
Baseline outcome		Yes		Yes		Yes		Yes		Yes
Baseline covariates		Yes		Yes		Yes		Yes		Yes
Region dummies		Yes		Yes		Yes		Yes		Yes
Observations	986	971	985	974	987	967	989	971	988	974
R-squared	0.005	0.052	0.002	0.032	0.008	0.043	0.001	0.025	0.001	0.078
Baseline mean control	20,553		21,583		2,671		17,047		3,672	

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). *** p<0.01, ** p<0.05, *p<0.