

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

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Preliminary draft, do not circulate

Abstract

In this paper we present the results of a randomized controlled trial designed to test the impact of an entrepreneurship skills sharing intervention using role models on the empowerment 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; posters of the inspiring women were also displayed in the clinic for the duration of the study. 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 some evidence that increased personal incomes leads to an increase in control over personal resources in the treatment clinics relative to the control. This has knock on effects for 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 preliminary findings 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.

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

Acknowledgments: 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 Nazarious Mbona, Martina Hennessy, Joe Barry, Sarah Glavey and Sara O'Reilly of Trinity College Dublin, Fiona Kalinda of JCRC 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 and in particular to Kjetil Bjorvatn and Jakob Svensson. The authors wish to thank also participants at various seminars and conferences including the AEA/ASSA Meetings 2016, NHH and Trinity College Dublin. The authors are indebted to Tom Burke (Areaman Productions) who directed the videos and Aisling Calt for the video editing.

1. Introduction

Over the past years, an emerging literature focused on how development policies can better target human behavior. The recent World Development Report (World Bank, 2015) has indeed 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. This paper contributes to this literature, by investigating the impact of role models and bottom-up knowledge sharing on the livelihoods of vulnerable, excluded groups. The literature so far has shown 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. Bernard et al. (2014) 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 found to be improved among treated individuals. In particular, the authors provide evidence of the documentaries having an impact on savings and credit behavior and children's education.

This paper builds upon the findings by Bernard et al. (2014) in two ways. First, we focus on a specific group of individuals, who are usually discriminated (women) and who carry a substantial social stigma (HIV-positive patients). Second, we consider a longer time horizon in the assessment of the impact of the exposure to role models. In doing so, this paper can address two fundamental questions. Do role models and bottom-up knowledge sharing have an impact in the way in which discriminated individuals think and behave? Is this impact permanent or does it fade away over time?

Participants in the project were randomly selected among HIV-positive women attending health clinics in rural Uganda and randomization into treatment took place at clinic level. A random sample of patients in treated clinics was invited to the screening of four videos of inspiring women.¹ A three-minute video was shown for each round of intervention, 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

¹ 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.

different aspects of the challenges and goals of the four inspiring women. The first video and the last one are more inspirational, while the second one stresses the importance of children's education as the driving reason of the entrepreneurial activities. The third video highlights the more entrepreneurial and business strategic aspect.² Each video ended with a final message, similar across the four videos and which was meant to encourage viewers that anything was possible for them too. A set of posters featuring the inspiring women was affixed in each treated HIV clinic at the end of the screening. A group discussion took place during and after the video screening and it was led by one of the co-authors. The screening could take place several times per day, depending on the number of participants.

We provide evidence that role models have a positive effect on the probability of starting a business, income from crops and livestock and enterprise income. We find no effect on other household income, a result which is not unexpected given the message contained in the videos. The treatment has some effect on control over personal resources in the video clinics, although the effect is short-lived. More importantly, the videos are found to lead to better health among women and their children and a lower proportion of children absent from school. Finally, women in the treatment group save more. These latter two findings suggest that this simple, cost effective and easily scalable intervention could have long term effects on welfare outcomes. Our preliminary findings 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.

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 health clinics in rural Uganda. The data used in our analysis consist of a sample of patients of type III and

² It is widely agreed that female empowerment leads to improved outcomes for women and children (Duflo, 2003; Hamad et al., 2011; Qian, 2008; Thomas, 1990). An effective means of empowering women is to enhance their economic status by encouraging them to establish their own household enterprises providing them with their own source of income (Ashraf et al. 2010; Hamad et al., 2011). There are, however, constraints to enterprise development. These include: physical capital constraints (Banerjee and Duflo, 2008), human capital constraints (Berge et al., 2010; Giné and Mansuri, 2011) and information problems and access to output markets (Bakeine, 2009).

IV clinics, run by our partner institution, JCRC.³ A health centre III facility is located at sub-county and serves about 20,000 people. These usually have about 18 staff, led by a senior clinical officer with a general outpatient clinic, a functioning 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, 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.⁴ 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. The fieldwork team, led by two of the co-authors, set appointments for a three-day visit in each clinic. 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 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 132 patients were recruited in each clinic. Appointments with the fieldwork team for the subsequent intervention/interview rounds were made to coincide with the participants' routine medical appointments.

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 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 in groups, as they came along for their visit at the health clinic. For each

³ 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.

⁴ Of the four sub-regions, the Mid-Northern is the one with the highest poverty level, as shown in Table B1, with 43% of the population classified as poor.

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 agreed in advance, at the start of each round of the intervention, with specific instructions to follow in order to guide the group discussion. 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.

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.⁵ Six women were filmed and eventually four videos were picked to be screened. Filming took place in October 2014 by director Tom Burke of Areaman Productions, 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.⁶ 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 first video and the last one are more inspirational, while the second one stresses the importance of children's education as the driving reason of her entrepreneurial activities. The third video highlights a more entrepreneurial and business strategic aspect.⁷ The final message was similar across the four videos and it was meant to encourage viewers that anything 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*". A set of posters featuring the inspiring women was affixed in each treated HIV clinic at the end of the screening. The screening could take place several times per day, depending on the number of participants.

The first intervention round took place between October and December 2014 and each clinic was visited for two days. Reminders were sent to participants in both control and treatment groups to attend their clinic for their routine medical appointments. The first video (Sarah's story) was screened in the treatment clinics, followed by a short face-to-face interview. 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 of the first one, with a two-day

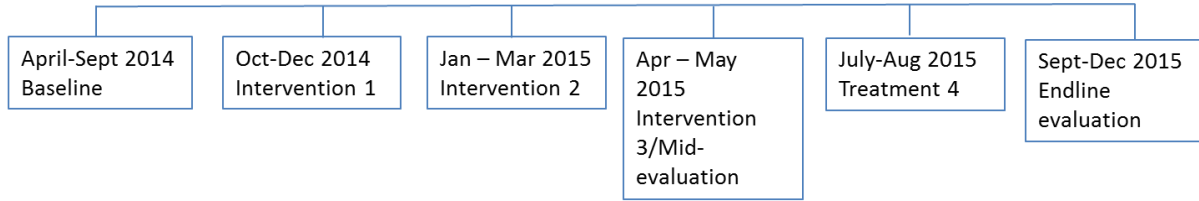
⁵ The casting did not involve any of the women in our sample of clinics.

⁶ 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.

⁷ The order of the videos was decided by the researchers on the basis of the inspiring women's interviews.

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, while the end-line evaluation was administered between September and December 2015. Participants in the control group were invited to attend the health clinics for their medical appointments and for the interviews, which took place at the same time as the treatment interventions.⁸

Figure 1: Timeline



3. Empirical strategy

We test the impact of the treatment, exposure to role models via videos, on a set of outcomes, ranging from income and livelihoods, to empowerment, health and education, savings and credit and, finally, entrepreneurial activity. Equation 1 presents the econometric specification used in our analysis.

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

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 video clinic. $Time_t$ 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 clinic level. Given the small number of clusters, we correct the clustered standard errors using Cameron et al. (2008), whose method is more reliable than other asymptotic tests with data clustered in as few as

⁸ 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 being that participants in the treated clinics were shown the videos while waiting.

five groups. The standard errors are derived as if the bootstrapped t-statistics was asymptotically normally distributed.

Descriptive statistics

Our sample at baseline consists of 2,121 women. We conduct a series of balancing tests to compare the control group with the treatment group, prior to the intervention. Table 1 provides information about the balancing tests. Participants in the control group tend to be 1 year older than participants in the treatment group and are more likely to have no education, although the difference is statistically significant at the 10% level only. We find no evidence of statistically significant differences at baseline in terms of household size, marital status, number of years since being diagnosed as HIV positive, and number of years on anti-retrovirals (ARVs), illness in the previous 30 days and body mass index (BMI). In terms of children's health, a higher percentage of children are reported to be sick in the treatment group and are reported to be absent from school. There is no statistically significant difference in school enrolment rates between the two groups, while 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 no difference in food expenditure, total personal income, total household income, wage income, livestock income between the two groups. Participants in the control group have a higher crop income and non-agricultural income. No statistically significant difference is found in the percentage of participants working for a wage or running an enterprise (i.e. being self-employed). 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 appear to be balanced and when statistically significant differences emerge, they appear to go against the treatment having any impact.

Table 1: Summary statistics and balancing tests

A. Demographics	Mean Control	Mean Video	Difference	Stat. Sign.
Age	37.82119	36.48415	1.337042	***
HH size – Nr adults	1.278146	1.273775	.0043705	
HH size - Nr Children	2.194891	2.243996	-.049105	
Widow/Single	.5562914	.543708	.0125834	
Years diagnosed HIV	5.13093	4.967054	.1638755	
Years on ARV	2.710728	2.480695	.230033	
No education	.3632923	.3246878	.0386045	*
B. Health and Children Education	Mean Control	Mean Video	Difference	Stat. Sign.
BMI	22.18516	22.34107	-.1559112	
Illness	.2670455	.2536302	.0134153	
% children sick	.0941536	.1175661	-.0234125	**
% children in school	.9126383	.8937248	.0189135	
% children absent school	.3639885	.468557	-.1045686	***
Absence - school fees	.309987	.385696	-.075709	***
Absence - illness	.2031455	.2170439	-.0138985	
C. Income and Livelihoods	Mean Control	Mean Video	Difference	Stat. Sign.
Food expenditure	20566.52	21464.58	-898.0589	
Total personal income	63389.32	60755.83	2633.495	
Other HH income	76907.39	65105.82	11801.57	
Wage – personal	19612.17	22185.39	-2573.227	
Crop income – personal	15386.95	11519.95	3866.997	**
Livestock income - personal	3998.803	3113.899	884.9045	
Non agricultural income - personal	15221.37	11978.92	3242.452	*
Work for wage	.4450758	.4710983	-.0260225	
Self-employed	.2642045	.2854388	-.0212342	
D. Savings and credit	Mean Control	Mean Video	Difference	Stat. Sign.
Informal savings - amount	4105.038	4087.864	17.17395	
Formal savings - amount	21157.6	20384.69	772.9105	
Informal credit - amount	3888.889	3661.859	227.0302	
Formal credit - amount	17176.38	17943.88	-767.5025	
E. Cohabitant participants only	Mean Control	Mean Video	Difference	Stat. Sign.
Decision on:				
Individual income – alone	.811236	.7164502	.0947857	***
Individual income – husband	.0494382	.0541126	-.0046744	
Individual income – joint	.1370787	.2272727	-.0901941	***
Household income – alone	.2034314	.2014218	.0020096	
Household income – husband	.3382353	.2748815	.0633538	**
Household income - joint	.4240196	.5047393	-.0807197	**

Follow up surveys and attrition

As detailed in the previous section, participants in the project are HIV patients attending their health clinics. Participation in the project and, for the treatment group, in the intervention, was made to coincide with their routine medical appointments. Interviews and video screening took place while patients waited for their medical appointment, or soon after. All participants were contacted by phone with information about their next medical appointment and the meeting with the research team. 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 for missing the interview appointment is due to the assignment of patients to other HIV clinics. The second main reason is death. The attrition rate between the baseline and the mid-line is 38%, while the attrition rate between the baseline and the end-line is 44%. Table 2 presents the attrition rates over the project time period. The pattern of attrition is similar across the control and treatment groups. The majority of women that left the study did so between the baseline and the first intervention, while there is very little attrition between intervention/evaluation rounds.

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

4. Results

The first set of outcomes we consider captures the extent to which we observe behavioral change in relation to income and livelihoods as a result of the interventions. The results for each of these outcome variables using the specification in equation (1) are presented in Table 4. 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 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. The table also reports the p-value of the Multiple Hypothesis Testing, as detailed by List et al. (2016).

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 highlighted the stories of women running their own business enterprises. This finding provides evidence that exposure to role models had 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. Column 3 reports the impact of the treatment on the (log of) total personal income. It appears that the videos were effective in increasing total personal income in the short run, although the effect disappears in the long-run, as measured by the end-line evaluation. We investigate this issue further by separating the different components that make up total personal income. Columns 4 and 5 present the effect of the treatment on household income and income from waged employment. We do not find any evidence of an impact of role models on these variables. The fact that household income and income from wages are not affected suggests that this is due to the message contained in the videos. Next, we investigate the effect of the treatment on crop income, income from livestock and income from enterprises. The stories presented in the videos mainly related to agricultural business activities, and advice was given by the inspiring women regarding business strategies in livestock trade and setting up small enterprises. Therefore we would expect to see a greater impact of the treatment on this form of income compared with other income-generating activities. This is indeed the case, as shown in Column 5, 6 and 7 respectively. Women in treated clinics have a higher crop income, a higher livestock income and a higher enterprise related income.⁹ 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.

⁹ 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.

Table 3: Income and livelihoods

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Operates an Enterprise	Works for a wage	Personal Income	Household Income	Wage Income	Crop Income	Livestock Income	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]***
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	0.155	-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). 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 endline accounting for multiple outcomes (List et al, 2016). .*** p<0.01, ** p<0.05, *p<0.1

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 B2 in the Appendix 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 4 presents 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 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 campaigns are 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 4 shows that we cannot reject the null hypothesis of a statistically significant difference between the treatment and control group at end-line. In order to better investigate this issue, Table 5 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 was slightly decreases over time, and the main effect seems to take place at mid-line.

Table 4: Intra-household economic empowerment

	(1)	(2)	(3)	(4)	(5)	(6)
	Personal inc alone	Personal inc husband	Personal inc joint	Household inc alone	Household inc husband	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]
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	0.016	-0.004	-0.010	0.016	0.058	-0.001
t-test (p-value)	0.481	0.344	0.653	0.406	0.132	0.984
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). 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 endline 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 5: Intra-household economic empowerment - supplementary

	(1)	(2)	(3)	(4)	(5)	(6)
	Personal inc alone	Personal inc husband	Personal inc joint	Household inc alone	Household inc husband	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)
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)
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
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. All specifications include women fixed effects. Sample restricted to women who co-habit at baseline and remain co-habiting for the duration of the study. *** p<0.01, ** p<0.05, *p<0.1

Does the video campaign have knock on effects for health and education? Table 6 explores the impact of the intervention on health and children's education. One of the recurring messages in the videos is related to the HIV status of the role models.¹⁰ 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 the four inspiring women mentioned that they were diligent in taking the antiretroviral drugs and looking after their health. We find that the videos led to better health among women, as a lower percentage of them report of being sick over the period prior to the interviews (column 1). Even more interestingly, the percentage of children reported to be sick is also lower in the treatment group.

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 7 explores whether the effect of the role models on children's education is short-lived. 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.

¹⁰ The four inspiring women in the videos were given the option to reveal their HIV status, ahead of the filming. They were informed that the videos would be screened in health clinics and what the target audience would have been. All four of them decided to reveal their HIV status.

Table 6: Health and education

	(1)	(2)	(3)	(4)	(5)
	Sick	% Child Sick	% Child Absent School	Child Absent - School Fees	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]
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
Endline 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). 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 endline 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 7: Health and education - supplementary

	(1)	(2)	(3)	(4)	(5)
	Sick	% Child Sick	% Child Absent School	Child Absent - School Fees	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)
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)
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**
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. All specifications include women fixed effects and round dummies. Sample in columns (2) to (5) restricted to women with children. *** p<0.01, ** p<0.05, *p<0.1

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 (column 3), while no effect is found for formal savings or credit.

Table 8: 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]
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
Endline 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). 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 endline accounting for multiple outcomes (List et al, 2016). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Conclusions

In this paper we test the impact of a role models intervention on income, livelihoods, education, empowerment and health for 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 some evidence that increased personal incomes leads to an increase in control over personal resources in the video clinics relative to the control, although this effect fades away in the long-run. This has knock on effects for 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 preliminary 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. The large scale and geographical scope of the sample makes our results highly relevant to policy makers in Uganda and elsewhere in sub-Saharan Africa.

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Appendix A¹¹

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.*

¹¹ 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 was 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 labourers, 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: 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)
Evaluation	0.351	-0.039	-0.092	-0.003
s.e.	(0.241)	(0.093)	(0.071)	(0.024)
Mean control at baseline	1.96	0.30	0.82	0.20
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. All specifications include women fixed effects and round dummies. *** p<0.01, ** p<0.05, *p<0.1