

## **An assessment of the FXBVillage Program in Uganda and Rwanda**

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## **Abstract**

The François-Xavier Bagnoud (FXB) Village poverty-alleviation model (known as the FXBVillage model) is a three-year community-based program that aims to help ultra-poor households transition to economic security. In this 'hybrid' program, households are initially given full support in essential material and human resources. In the context of FXB training and support, households increasingly attain greater economic autonomy through involvement in income-generating activities. Herein, using data from the monitoring and evaluation component of the program, we compare the status of beneficiary households before and after the FXBVillage poverty reduction model using a baseline and year-three follow-up survey, administered to 1,540 households in Rwanda (n=912) and Uganda (n=628). In Uganda and Rwanda, FXBVillage households demonstrated marked improvements across domains related to food security, overall health and access to medical services, vaccination among children (<5 years), and several household characteristics (e.g. access to clean water, increase in assets and durable goods). However, a few indicators changed negligibly, not at all, or changed only in one country; these include the percent of households consuming food grown at home, latrine improvement, and difficulty in engaging in usual daily activities, among others. Indicators in Rwanda tended to demonstrate greater improvements, potentially related to overall advancement of health status in the country. Overall, the results support improvements in many *a priori* targeted indicators of the FXBVillage program, but not all, highlighting the importance of context in understanding potential achievements and limitations of poverty-reduction strategies. Future work is necessary to examine costs, benefits, and effectiveness of the FXBVillage program in each setting, to document whether long-term effects can be sustained over time, and to better understand why and how to intervene upon the domains that were not successful.

Key words: Poverty reduction; Rwanda; Uganda; health outcomes; evaluation; hybrid program; ultra-poor

## Introduction

The multi-dimensional conditions and consequences of poverty, it is widely agreed, are interactive and persistent. At the same time that poverty is implicated in the erosion of quality of life and inequitable morbidity and mortality in vulnerable communities (1-3), these contribute to the perpetuation of poverty and can do so over generations (4-7). Devising and implementing strategies that can break communities out of what has been conceptualized as a “poverty trap” and promote long-term economic security has therefore become a priority of global development initiatives. Popular programmatic interventions toward poverty reduction include microfinance strategies, cash transfers, and direct food aid (8-10). While there are clearly pervasive links between poverty and poor health (11, 12), multilateral and bilateral agencies, as well as NGOs, are often divided on the best approach (8, 10). Strong arguments exist, however, that poverty reduction cannot be a ‘one size fits all’ endeavor and should be informed, if not directed, by members of the affected communities. For this reason, there has been increasing interest in programs that are able to effectively link immediate relief and lasting economic security with community-based initiatives (13).

In this policy and programming climate, the purpose of this manuscript is to compare the status of beneficiary households and their members before and after the FXBVillage programs implemented between 2009 and 2012 in Rwanda and Uganda, using data from the monitoring and evaluation component of the program. Motivated by the concept of “removing unfreedoms” described by Sen (14), the FXBVillage program is a three-year, multi-dimensional poverty-alleviation model that simultaneously targets overlapping deprivations in health, education, and living standards linked to sustained poverty, poor quality of life, high morbidity and mortality, and lack of financial empowerment (Table 1). In this model, full material support is initially provided for numerous basic resources. Over time, material support is decreased while support for engagement in local microfinancing initiatives and income generation activities (IGAs) is increased. In this way the program transforms from one that offers ‘relief’ to one that promotes

economic security and locally-valued development at the household and community level (Table 1, S1 Table).

Herein, we evaluate the FXBVillage program by assessing pre/post changes in child and adult health status and access to care, household characteristics, food security, economic status, access to education, psychosocial status and well-being at baseline and at the culmination of a three-year program. We also conduct an exploratory comparative analysis in which the FXBVillage data are compared against national data collected by the Demographic and Health Surveys during the time of the FXB programs, using an asset-based wealth index.

## **Materials and Methods**

This report adheres to the guidelines for *Transparent Reporting of Evaluations with Nonrandomized Designs* (TREND) protocol as much as possible given the study design (15). Additional information about the FXBVillages program and this empirical analysis is available as supporting information online (see S1 Text for more details).

### *Setting and study population*

The FXBVillage program is an initiative of the non-governmental organization FXB-International, and has gone through a number of iterations in eight different countries since its initial implementation in Uganda in 1991 (16). A detailed summary of the program is provided in Table 1 and S1 Table online. In December 2008, FXB was selected into the New Partnership Initiative of the United States Government's President's Emergency Plan for AIDS Relief (PEPFAR). Twenty new villages were planned for Rwanda and Uganda under this new grant, which awarded not only funding but technical assistance in strengthening management capacity, including monitoring and evaluation, with assistance from in-country USAID representatives (17).

In Rwanda, the FXBVillages were located in 12 rural (remote from the city) communities in Muhanga, Nyamagabe, and Rubavu Districts (respectively 45, 183 and 144 kilometers from the capital city, Kigali). The majority of the population (over 86%) engaged in farming as the primary source of food and/or income. In Uganda, the villages were located in 4 rural (remote from the city) communities in the Kyenjojo district (220 kilometers from Kampala) and 4 poor urban communities in Kampala itself. In each community, approximately 80 households were selected into the program (n=1,597 at baseline; n=1,540 at Year 3 follow-up, 96.4%). Beneficiary households were selected on eligibility criteria including relative poverty level, motivation or willingness shown to achieve the program objectives, community reputation, no articulated desire or plan to migrate, and having orphan or vulnerable children in the household

(see S1 Text for more details). In addition, a random sample (n=510, 33.1%) was constructed by selecting every 3<sup>rd</sup> household from a randomly-ordered household list for each FXBVillage. This sub-sample participated in follow-up surveys in 2010 and 2011 (Years 1 and 2) to enable an interim examination of the program.

### *Household surveys and assessment*

A structured face-to-face interview was administered between program staff and heads of households. It included the following sections, to align with FXBVillage targets and activities: (1) household demographics, (2) nutrition, (3) general health, (4) HIV, (5) water, sanitation, and environment, (6) psychosocial perceptions and views, (7) children's health, education and support (separately < 5yrs and 5-17 years of age), (8) household finances/ economics, and (9) collective income-generating activities. Questions were derived and adapted from the Demographic and Health Surveys (DHS) questionnaires (18, 19) and the UNICEF MICS3 survey (20). Sections that derived items from other sources included nutrition (21), psychosocial (22, 23), household finances/ economics (1), and income generation (1).

### *Child health indicators*

Anthropometric data, specifically mid-upper arm circumference (MUAC) and weight, were collected by the program staff on children aged 0-60 months to assess malnutrition (24). Examination of the data found significant evidence of age heaping at single year intervals (25, 26), in the baseline survey for children under 5 years. Therefore we did not estimate child anthropometrics using age-specific growth standards and cut-offs (24). For this analysis we examine only the country-specific MUAC distributions for shifting to the right (indicating a shift away from malnutrition cut-offs) using a Wilcoxon rank sum-test. Though imperfect, and while MUAC increases with age and height (27-29), therapeutic feeding programs tend to use MUAC cut-offs without age-adjustment (28, 30), as adjustment often does not result in improved

mortality prediction (31, 32). In addition, all children >1 year of age were surveyed to indicate the status of their measles, bacille Calmette–Guérin (BCG), DTP (Diphtheria, Tetanus and Pertussis) [3 doses], and Polio [4 doses] vaccines using the WHO vaccination schedules (24).

### *Empirical strategy for evaluation*

Geographic (e.g., country) and temporal (same household over time) correlation must be accounted for in this statistical analysis (33, 34). Geographic correlation was accounted for by doing separate analyses for Rwanda and Uganda, and repeated measures in the same household over time were accounted for by using generalized estimating equations (GEE) with robust standard errors and an exchangeable correlation (corresponding to equal-correlation models) as our regression framework (35).

Baseline rates of several outcomes differed between countries and pooled analyses suggested that changes occurred at different rates over the duration of the FXB initiative. As a result we present results for Uganda and Rwanda separately. Additionally, because many outcomes were binary and relative measures can mask or exaggerate small changes based on the prevalence at baseline, we do not display regression coefficients but rather the percent and sample size (or median and interquartile range) over time.

For each outcome measure we assessed all completed responses and note the number of missing where relevant for interpretation (e.g., Table 2, last column). For each set of the domains (e.g., Table 2 examines 4 domains, for example the first two are nutrition [4 measures of change] and general health [8 measures of change]) we use the Holm-Bonferroni method (36) to adjust our level of statistical significance to deal with the potential issues of multiple comparisons (37, 38). This adjustment, which sets a higher threshold for statistical significance to reduce the likelihood of attributing observed changes to the FXBVillage program erroneously due to the number of outcomes examined, did not alter the interpretation of the unadjusted results, as in many cases the changes were large.

In the absence of a control group, we sought to examine how the FXBVillages compared to the overall economic status of a large sample of households in Uganda and Rwanda around a similar time period. To do so, we merged the FXBVillage data with the 2010-11 Demographic Health Survey (DHS) in Rwanda (n=2,009 urban and n=10,531 rural households) (19) and the 2011 DHS collected in Uganda (n=2,250 urban and n=9,090 rural households) (18). As part of the DHS program, which has conducted over 250 national surveys in low and middle income countries since the 1980s, a generalized “wealth index” has been created (39-41). Notably, the index score seeks to measure household wealth, not income or expenditures. It does so because the latter is susceptible to several potential reporting and measurement biases, whereas the household wealth score is based on observable assets (39-42). Stata version 13 was used for all statistical analyses (StataCorp, College Station, TX).

### ***Ethical Review***

This analysis used de-identified data and was reviewed and approved by the Institutional Review Board at the University of Pennsylvania and Harvard University.



## Results

### *Baseline Characteristics of the targeted sample (n=1,597)*

Nearly one-third of the selected heads of beneficiary households reported that they had no formal education (24% in Uganda and 31% in Rwanda). Approximately 38% reported at baseline that they were widowed (26% for Rwanda and 58% for Uganda). Nearly 6% were child-headed households in both countries. The presence of both a mother and a father figure was reported by 20% of households in Uganda and 49% in Rwanda. The majority of households in the rural communities said that agriculture was their primary occupation whereas households in the urban communities (in Kampala) were not involved with agriculture but had a range of other primary occupations, including selling food and charcoal. The mean household size was more than six people (range 1-21, median=6, IQR=5-7), with 83% of households in Uganda and 42% in Rwanda reporting at least one orphan and 1.7 beds on average, with only 29% (21% in Uganda and 34% in Rwanda) of households reporting that all household members could sleep in a bed on a consistent basis (see S2 Table).

### *Longitudinal results*

#### *Household sample (n=1,540)*

Of the initial 1,597 households, 1,540 (96.4%) were available to complete follow-up at Year 3. Attrition was similar in each country (11/639=1.7% of initial Ugandan households, 46/958=4.8% of initial Rwandan households). As mentioned, to facilitate the interpretation of results within each country, figures and tabular results are presented separately for Uganda and Rwanda in the main paper with pooled results for key household indicators summarized in S3 Table. For ease in presentation, we primarily report pre/post data on these 1,540 households at baseline and Year 3; the available interim sample is smaller (n=510) and the results are quantitatively indistinguishable as the interim sample was a random sample (S4 Table).

### *Food security and production*

At baseline, 44% and 5% of households in Uganda and Rwanda, respectively, reported to have at least 3 meals on an average day, whereas at the end of the program period these estimates increased to 86% and 88% ( $p < 0.001$ ) (Table 2). The percent of households that reported having a day in the prior 3 months with no food dropped from 47% to 9% in Uganda and 74% to 2% in Rwanda ( $p < 0.001$ ). In Rwanda, the number of households that reported that the food consumed was grown at home increased from 29% to 83%; for Uganda, these rates (43% to 48%) were relatively similar between waves, but the increase was also statistically significant ( $p < 0.001$ ).

### *General health*

While about 85% of households in each country reported having access to health care services at baseline, 99% reported access at the end of wave 3 ( $p < 0.001$ ). In addition, the percentage reporting that access to care was free increased from 28% to 93% overall, with similarly large within-country increases (Table 2). Nearly all heads of households answering the survey reported having been tested for HIV by the end of Year 1. In addition, the percent of households reporting that they possessed and used mosquito nets increased to nearly 99%, with immediate uptake documented by Year 1 (S4 Table). While there was a large increase in overall knowledge of family planning methods (62% to 94%), 43.5% of the households did not respond to questions regarding use (Table 2).

### *Water and sanitation*

As part of the program every household received training about hygiene and sanitation in Year 1. At the baseline survey 50% and 67% of households in Uganda and Rwanda treated their drinking water, and at each subsequent wave nearly every household reported treating their water to make it safer to drink (Table 2, S4 Table). There were smaller changes in the

primary water source. Though water access differed between and within countries at baseline, significant increases in the use of protected water sources was achieved across both countries. The pooled percentage increased among households reportedly using a protected well (31% to 34%), a public tap/standpipe (25% to 31%), or a protected spring (9% to 16%). Declines were observed in households using an unprotected well (15% to 11%) or unprotected spring (7% to 0.7%). In Rwanda the percent of households using a flush toilet or ventilated improved pit latrine increased from 21% to 94% ( $p < 0.001$ ) by the end of the program, but in Uganda only a few households reported greater access to these types of facilities (15% to 19%;  $p = 0.069$ ).

#### *Psychosocial well-being among adults*

The percent of respondents who reported to *never* have (1) a good sense of what makes life meaningful, (2) a satisfying purpose in life, (3) a strategy to get out of difficult situations or (4) around problems, (5) get the things important to them, or (6) ability to solve problems when others are discouraged was nearly zero in both countries at the end of follow-up. Social, emotional and material support also appeared to improve (S5 Table), based on those who reported having a confidant, somewhere to stay if needed, or who could lend them money if they needed it. At the end of the program, household heads in Uganda and Rwanda still reported at least some difficulty with usual activities, such as self-care, work or recreation (61% and 17%, respectively).

#### *Child health and schooling*

The results reported in this section are at the child, not household level (Table 3). In both national groups, rates of testing for HIV among children increased, but the rate was less than 90% for all child ages. Among children 12-59 months of age, rates for most vaccines were near or above 80% in Rwanda at baseline and increased to about 90% with the exception of measles, which was 28.7% and only increased to 39% at wave 3 (Figure 1). The baseline rates

for all immunizations increased from roughly 50% to above 70% in Uganda (Figure 1). The percent of children with kwashiorkor decreased from 14% to 1%. The un-adjusted MUAC distribution exhibited a shift to the right in both countries in year 3, compared to the baseline values (rank sum p-values of 0.059 in Rwanda and 0.011 in Uganda) (Figure 2).

School attendance reported as “always” among those aged 5-17 years increased to over 90% (from 71%). An improvement was observed in the percent of respondents reporting that their children had adequate school supplies (4% to 71% in Uganda, and 7% to 97% in Rwanda) and a reduction was observed in the percent of respondents whose children could not attend school regularly due to financial constraints (57% to 6% in Uganda, and 30% to 0% in Rwanda) or illness (Table 4).

#### *Household economics and durable goods*

The percent of households that owned their home increased in Uganda (59% to 65%) and Rwanda (57% to 89%). This corresponded with increases in ownership of several personal and household assets, such as a cell phone, household furniture and mattress, small and large livestock, and, in Rwanda only, a large increase in the ownership of additional land (Table 4). This increase corresponded with an increase in the percentage of households participating in IGAs for agriculture (4% to 48% in Uganda and 18% to 68% in Rwanda) and working with livestock (2% to 61% in Uganda and 2% to 28% in Rwanda) over the same time period.

#### *Comparing changes among FXB households using DHS households*

In Rwanda, where we compared the FXB households to the rural households surveyed in the 2010-11 DHS, a clear shift to the right in the distribution of the wealth index from baseline to wave 3 is visible for the FXB villages (Figure 3, S6 Table). At baseline, FXB households were to the left of the DHS distribution, indicating they would be comparable to the poorest rural DHS

households sampled. The shift moves some of the households from being among the poorest towards the middle of the rural wealth distribution in Year 3.

In Uganda, the asset index was more complicated to estimate because of significant differences in a few indicators, making the comparisons difficult (S7 Table). Additionally, several indicators were much higher at baseline in the FXB households than the DHS sample. For instance, almost all FXB households were reported as having a metal roof, but almost none of the DHS households reported a metal roof. Additionally, almost every household in both surveys reported to cook with wood or charcoal, so limited information could be derived from some assets. Further, some FXB households were near Kampala, not rural, so a countrywide wealth index might be overly conservative and a rural-only index may be too liberal, and both are susceptible to misinterpretation. Thus, we compare the FXB households with the DHS data from Uganda using both all households and rural households, and using a modified wealth index without including roof material and cooking fuel. The bimodal distribution in both comparisons suggests that, over the course of the FXB initiative, about half of the Ugandan FXB households shifted their position away from poverty, while the other half did not (Figure 3).

## **Discussion**

The overall findings of this pre/post analysis of the FXBVillage program are encouraging. Relative to baseline, significant positive changes across several targeted domains were observed for each country group, including access to health care, school attendance and several household commodities. In particular, Rwanda demonstrated greater improvements in latrine facilities, vaccination coverage, and food security, compared with Uganda.

### *Household and community economic development*

Although very few poverty reduction programs mirror the combination used in the FXB model, microfinancing initiatives (43, 44) and cash transfers programs have been widely used; though success rates vary, these are generally seen as promising economic initiatives (45). For example, a microcredit program in Uganda also resulted in increased home ownership (an increase in nearly 10% for program clients vs. only 1.6% for non-clients) (46), similar to the FXBVillage program (Table 4). Other microfinancing and microloan programs in Bolivia and Zimbabwe also demonstrated improvements in spending power and retention of household assets among participant households (46, 47). However, evidence suggests that these effects may be less pronounced among the most impoverished. Explanations suggested in the literature include lack of time, knowledge, and stable housing, as well as fear of the cash economy (46, 48).

As the FXBVillage covers household costs during the first year, rather than providing cash directly, this approach can be characterized as a hybrid method intended to help very poor households into a position where they can benefit from microfinance schemes. There have been two similar approaches pursued: the Bangladesh Rural Advancement Committee's (BRAC's) "Challenging the frontiers of poverty reduction/ targeting ultra-poor, targeting social constraints (CFPR/TUP)" and the Millennium Villages Project (MVP), aim to combine aspects of initial

immediate assistance (or capital investment) while providing training intended to prepare households for transitioning to longer-term economic security. Working with the 'ultra-poor' in Bangladesh, BRAC provides up front 'capital' inputs as well as improved health services to increase capacity of households to transition to their standard microfinancing program. The rate of extreme poverty in the group enrolled in the intervention was 59% (down from 89%) compared with 73% in the non-intervention group (down from 86%) (49). Similarly, contributions of fertilizer, improved seeds, and agricultural trainings in the MVP led to improvements in crop yields and farmers' profits in Mali, Tanzania, Senegal, and Kenya (50, 51).

#### *Food security and nutritional status of children*

The data suggest an increase in food security among participating households, evidenced by a significant decrease in the percentage of households that went without food for at least one day, and a significant increase in the average number of meals consumed per day in the past three months (Table 2). The percentage of children <5 years that presented with MUAC below the critical cut-off as well as those with signs of kwashiorkor decreased over the course of the program overall, but not equally in both countries or in the same direction (Figure 3). These results align with previous findings of gains in food security using similar economic interventions (46, 47, 49, 52, 53). However, it is notable that not all households ultimately appeared to attain food security (Table 2). As improvements in food security and children's nutritional status are generally linked (54-58), this might partially explain the observed MUAC results, especially in Rwanda. The cultivation of household gardens is strongly encouraged in the FXB program. Expanded agricultural assistance may be needed for households that are slow or less successful adopters of this initiative to support attainment of sustainable food supplies and security for essential produce in all households. Examination of the data at each year of follow-up shows that rate of success in the food security and quantity increased monotonically over time, and not immediately, like other outcomes (S4 Table).

### *General health, water and sanitation*

Decreases in prevalence (and thus attendant hospitalizations) of children with diarrheal disease and respiratory distress were observed at the first year of follow-up and continued throughout the follow-up period. This aligned with concomitant increases in the percentage of households that treated their drinking water, used an improved latrine, and owned mosquito nets. Access to health care also appeared to improve, with substantial increases in up-to-date immunizations (especially in Rwanda, Figure 3), HIV testing, knowledge (but not necessarily use) of contraception, and health insurance coverage. This success might be a result of the synergy resulting from the multi-pronged approach used by the FXB Program. For example, an initiative in the Dominican Republic showed that the combination of health and economic initiatives demonstrated greater impact on similar child and adult health outcomes compared with either intervention alone [69].

### *Psychosocial well-being*

Most psychosocial outcomes appeared to improve, suggesting greater emotional and financial empowerment among respondents (S5 Table). While few studies have examined the association between poverty reduction programs and psychosocial outcomes, one study of women enrolled in a Self-Help Group (SHG) linked to small-scale savings and loan activities in Kerala, India demonstrated that those who joined the SHG early reported less emotional stress compared with non-members (59). In addition, those enrolled in a cash transfer program in Chile (*Chile Solidario*), were more optimistic about their future economic situation compared to those who did not participate (60). Inclusion of similar questions in future initiatives would open opportunities to investigate the subjective underpinnings of economic development and potential contributions to success (and failure) of programs.



### *Education and children's rights*

Dramatic increases in school enrollment, attendance, and availability of adequate school supplies were observed during the first year of the FXBVillage program and sustained through follow-up (Table 3 and 4). As the program progressed, respondents were less likely to report that their children could not attend school because they lacked financial means or were ill (Table 4). The reported number of hours children worked outside the home also decreased (although this was already low at baseline). The emerging evidence on educational initiatives suggests that multipronged targeting is needed to increase and sustain schooling (61). It is notable that there was not an increase in secondary school attendance, perhaps reflecting limits of local school opportunities or limited labor force prospects to motivate higher levels of schooling.

### *Wealth Index Comparison*

This analysis, applying the wealth index approach to DHS and FXBVillage households, suggests that there was an observable change in the poverty status of the FXB households at the end of the program relative to their starting position, both in the FXBVillages and in a large sample of households in each country.

There are some methodological limitations that warrant consideration when evaluating this specific part of our analysis. First, considering the observed shift in FXB household wealth relative to the DHS data, it is possible that some of the lag to the left of the DHS distribution shown by the FXB households at baseline is an artifact of economic and social development that occurred in the country after the FXB baseline survey and before the DHS survey. However, it is unlikely that such changes in household economics would be large and/or would be seen within 1-1.5 years across the nation. Nonetheless, it is a limitation that a DHS with similar questions does not exist for either country at the time of baseline data collection for the present study. Secondly, the DHS households were used without their survey weights, so they

may not be nationally representative, and can only be considered as a cohort of households surveyed in both countries.

A third important limitation is the omission of several important assets that could impact the distribution of the wealth index. This limitation can be seen comparing Figure 3b and 3c where the shape of the wealth index changes substantially with the removal of urban households in Uganda. Similar changes could occur with additions of other commonly collected assets that the FXB survey did not capture, and we could not include them in our analysis (39-42). Acknowledging that this observed shift might be a result of missing assets between surveys, measurement error or imperfect sampling strategy, these results serve to complement the primary pre/post results, and also suggest that the changes in FXB beneficiary households were meaningful, even when considering the additional limitations discussed below.

#### *Additional Limitations*

There are limitations to drawing strong conclusions about program impact in this evaluation. First, the pre/post comparisons cannot disentangle the effects of the program from the influence of context. A drought can change agricultural productivity, a presidential campaign can inspire rapid injection of capital into a health system; these and other kinds of factors external to the articulated program can bias the observed outcomes. Advances in the overall health system in Rwanda as compared to Uganda, for example, could in part explain why greater improvements on a number of outcomes were observed in Rwanda compared with Uganda. In Rwanda the FXBVillage Program staff had the opportunity to work within the context of a supportive government, sharing the same goal of poverty reduction and advancing health outcomes (62). In this regard, the context may have allowed the program to perform better. These issues cannot be teased apart. Still, given that improvements were also observed in Uganda without the same level of government inputs understood to exist in Rwanda, the

evidence suggests that the FXB program may have had a positive effect on a number of health, education, and economic outcomes.

A randomized controlled trial design was not employed in this evaluation; because the FXBVillage program targets ultra-poor households in acute and critical circumstances, FXB leadership took an ethical position against the use of a control group that would not receive full program support to the program's best understanding of what constituted support, with all available resources, as soon as they were identified.

The potential for bias is also inherent in this study, because the findings were largely based on self-report by program participants. 'Social desirability' may artificially inflate the observed improvements (63). Use of items, such as bednets, may vary from what program implementers understand to be "best practices." Yet, concrete outcomes, such as increase in assets within the home, are less prone to bias (e.g. ownership of a radio, mobile phone, mattress, etc.) and were similarly positive. Contrastingly, some child health indicators, such as the MUAC and weight, may have been measured with error and in addition, could not be evaluated using age-specific changes due to heaping in the reporting of ages. Finally, there are other potential social (e.g., women's empowerment), health (e.g., infant mortality and other infectious or chronic diseases) and economic (e.g., time use, financial inclusion, or consumption and savings) indicators that were not collected that may have been informative.

### *Conclusions and Implications for ultra-poor poverty alleviation programs*

In summary, the evidence herein suggests that the FXBVillage had a positive impact on households in a number of villages in both Rwanda and Uganda across a broad range of indicators related to food and economic security, health and nutritional status, safe water and sanitation, psychosocial well-being, and educational resources and participation. The magnitude of the positive changes may in part be related to the context, whereby greater advances were observed in Rwanda as compared with Uganda. The findings from this study are consistent with

other poverty reduction programs that employed similar components including cash transfer (52, 56) microfinancing (47, 64, 65), and strategies that combine the two in some fashion (50, 51, 66). Although integrated health and economic programs have demonstrated effectiveness (49, 51, 64, 66), additional programmatic factors likely contributed to the substantial changes observed in the FXB households. First, the FXBVillage model has been informed by those living in the affected communities. The critical development literature notes a long tradition of model village interventions and the potential of such programs to overlook local values (67-69). FXB efforts to engage community members from the early stages of program development may have partially addressed this and enhanced the potential for active participation in the program (70). Secondly, FXB pays its program staff and enables them to provide the intended support while meeting their own household's needs. FXB hires two full-time program staff for each program — a nurse counselor and a social worker — and these are supported by a logistician and several advisors who support programs addressing child rights, HIV prevention and IGA development. In contrast, many other programs engage community volunteers to carry out programs and contend with associated challenges of supervision, retention and motivation (71, 72). Thirdly, the program is a “hybrid” of direct material assistance and support for microfinancing; its provision of “up-front” material resources and social supports gives households an alternative to survival strategies that do not promote economic growth and well-being of the community (73-75). As the initial investment of resources is reduced, training in locally-appropriate income generating activities is being offered.

This integrated transition has been referred to as an *'injection of capital as an investment'* and has been successful in other settings (76, 77). Integration requires work, however, and this is an important area for future evaluations to consider. A key aspect of the FXB program is the work of social relationships among staff and household members; the nature and quality of these relationships is likely important to the short and long-term effectiveness of the program. In addition, working within the context of a supportive

environment, such as a government with progressive social policies, may result in greater improvements.

In summary, the results of this initial assessment suggest that the presence of the FXBVillage Program associates with improvement on many indicators of poverty in the targeted Ugandan and Rwandan households measured in this study. Future work is necessary to examine the costs, benefits, and effectiveness of the FXBVillage program in each setting, to document whether long-term effects can be sustained over time, and to better understand why and how to intervene upon the domains that were not successful.

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## **Data availability statement**

All relevant data is provided in the manuscript and supporting information. The original data are available upon request to interested researchers from FXB-International (Sacha Jeanneret: [sjeanneret@fxb.org](mailto:sjeanneret@fxb.org)) pending appropriate ethical approval from their institution.

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**Table 1: Key elements and description of the FXBVillage Model**

<b>General</b>	
Duration of program	3 years
Per-person cost per year	~140 USD
Per-person cost per program	~420 USD
Number of participants per program	500-600 people
<b>Graduation timeline</b>	
Year 1 contribution (FXB contribution=100% Participant contribution=0%)	Participants receive direct consumption support for nutritional, educational, and other health and household needs (S1 Table). Focus is put on alleviating malnutrition and immediate financial needs, so that families can focus on income generating activities (IGAs), which begin in the first quarter of year 1. In-kind material support (approximately US\$135) helps program participants purchase the durable goods, such as livestock, necessary to start a business. Food supplements are provided for the first nine months. Nurses conducting home visits assess child malnutrition and illnesses in the household, facilitating referrals for care as needed. Participants are provided with necessary resources and educated about adequate kitchen ventilation, water treatment, sanitation, use of mosquito nets, nutrition and safe food preparation, HIV testing and prevention. Psychosocial support, provided by the nurse counselor, seeks to improve subjective well-being. HIV testing and prevention are also encouraged as a component of the nurse counselor's sessions. Life-skills coaching on management, financial literacy, working in groups and advocacy is a priority.
Year 2 contribution (FXB contribution=75% Participant contribution=25%)	Participants begin their IGA and to contribute 25% to their household's school and medical fees, with the guidance and support of FXB staff members. Ongoing home visits aim to support families in their transition out of poverty. Participants are also encouraged to maintain vegetable gardens, as the project ends direct nutritional support after the first nine months of the program. Additional focus is put on enhancing group saving and loan schemes and financial management, as well as on learning investment skills, building gender awareness and participation, introducing linkages to other civic and private service providers, promoting quality products, and developing marketing skills.
Year 3 contribution (FXB contribution=50% Participant contribution=50%)	Participants take on 50% responsibility for schooling and medical costs. FXB provides continued support for IGA projects. Ongoing home visits aim to support families in their transition out of poverty through programmatic activities outlined below as needed.

Details regarding each component are provided in S1 Table in the supporting information. Additional information can be found at <https://fxb.org/toolkit/>.

**Table 2: Household nutrition, health, water and sanitation characteristics (2-years sample, n=1,540)**

	Uganda			Rwanda			Total households with missing data
	Baseline	Wave 3	p-value for change*	Baseline	Wave 3	p-value for change*	
<b>Nutrition (in the past 3 months)</b>							
3 or more meals per day on average	279 (44)	537 (86)	< 0.001	42 (5)	805 (88)	< 0.001	2
Household had a day with no food	295 (47)	56 (9)	< 0.001	672 (74)	19 (2)	< 0.001	0
Quantity of food available for household deemed "plenty" or "just enough"	138 (22)	569 (91)	< 0.001	228 (25)	869 (95)	< 0.001	1
Food consumed by household has been mostly home grown	272 (43)	302 (48)	< 0.001	262 (29)	758 (83)	< 0.001	0
<b>General Health</b>							
Currently has access to healthcare services <sup>1</sup>	548 (87)	621 (99)	< 0.001	768 (84)	906 (99)	< 0.001	1
Travel time to nearest health care facility			< 0.001			< 0.001	14
<30min	187 (30)	422 (67)		257 (28)	483 (53)		
30-60min	98 (16)	164 (26)		423 (47)	333 (37)		
>1hr	333 (54)	42 (7)		229 (25)	95 (10)		
Access to free health care in past 6 months	286 (46)	594 (95)	< 0.001	139 (15)	845 (93)	< 0.001	8
Reported having health insurance in past 6 months	31 (5)	100 (16)	< 0.001	689 (76)	910 (100)	< 0.001	63
Zero episodes of diarrhea for a child <5yrs in household in the past month <sup>2</sup>	318 (51)	588 (94)	< 0.001	671 (74)	891 (98)	< 0.001	1
Reported zero overnight hospital stays due to an episodes of diarrhea of a child <5yrs living in household in the past month <sup>2</sup>	380 (61)	621 (99)	< 0.001	861 (94)	908 (100)	< 0.001	1
Zero episodes of severe cough or difficulty breathing for a child <5yrs in household in the past month	347 (55)	603 (96)	< 0.001	739 (81)	904 (99)	< 0.001	1
Reported zero overnight hospital stays due to severe cough or difficulty breathing of a child <5yrs living in household in the past month	394 (63)	622 (99)	< 0.001	863 (95)	909 (100)	< 0.001	1
<b>Health and HIV</b>							
Head of household has been tested for HIV	385 (61)	612 (97)	< 0.001	706 (77)	909 (100)	< 0.001	0
Reports to know of family planning (birth control) methods	368 (59)	570 (91)	< 0.001	591 (65)	881 (97)	< 0.001	0
Reports to have used methods of family planning <sup>3</sup>	255 (69)	347 (61)	0.109	389 (66)	656 (74)	< 0.001	52
<b>Water and sanitation</b>							
Received education and training about hygiene and sanitation	362 (58)	623 (99)	< 0.001	287 (31)	908 (100)	< 0.001	0
Takes >30min to acquire potable water and return	152 (25)	99 (16)	< 0.001	200 (22)	106 (12)	< 0.001	51
Household treats water to make it safer to drink	316 (50)	623 (99)	< 0.001	613 (67)	902 (99)	< 0.001	0
Uses flush or ventilated improved pit latrine as toilet facility	97 (15)	120 (19)	0.069	187 (21)	858 (94)	< 0.001	1
Cooking facilities have appropriate ventilation	313 (53)	598 (97)	< 0.001	279 (32)	856 (95)	< 0.001	50 <sup>4</sup>

Reports ownership of a bednet for use in household<sup>5</sup>

282 (45)

612 (98)

< 0.001

501 (55)

910 (100)

< 0.001

11

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The table reports the number (no.) and (%) for each indicator for each question in each wave. The percentages represent the prevalence of the response among those who had a recorded answer to the survey question. The frequency of missing data is indicated in the final row of this table, and was generally limited and non-deferential across waves.

\*The p-value was estimated using a generalized estimating equation (GEE) that used robust standard errors to account for the clustering resulting from repeated measures of the same household over time.

<sup>1</sup> For example, access to vaccinations for children, care in the event of fever or diarrhea.

<sup>2</sup> Diarrhea is defined here as three or more loose or watery stools in one day.

<sup>3</sup> Only women who reported that they knew of family planning methods were asked to answer this question.

<sup>4</sup> 69 households (n= 47 at baseline and n=22 in year 3) used electricity (n=33 and n=5 at baseline and year 3) or liquid gas propane (n=14 and n=17 at baseline and year 3) and were not included because this question did not apply to them.

<sup>5</sup> Includes both un-treated and insecticide-treated bednets.

**Table 3: Health and education status of FXBVillage youths, ages 0-17 years**

	Uganda			Rwanda		
	Baseline	Wave 3	p-value for change*	Baseline	Wave 3	p-value for change*
<b>Children &lt; age 5 (0-59 months)</b>						
<i>Total children in all households (n)</i>	556	469		777	462	
Has been tested for HIV	117 (21)	229 (49)		135 (17)	378 (82)	
Able to produce immunization card to staff	227 (41)	336 (72)		543 (70)	409 (89)	
Immunization card up-to-date	179 (32)	313 (67)		484 (62)	413 (89)	
Child has symptoms of kwashiorkor	25 (4)	0 (0)		160 (21)	10 (2)	
<b>Children ages 5-17</b>						
<i>Total children in all households (n)</i>	2352	2674		2337	2425	
Official birth registration	639 (27)	791 (30)	0.20	1917 (82)	2366 (98)	< 0.001
Has been tested for HIV	516 (22)	2173 (81)	< 0.001	596 (26)	2212 (91)	< 0.001
Currently enrolled in school	1915 (81)	2354 (88)	< 0.001	1765 (76)	2097 (86)	< 0.001
School attendance reported as "Always"	1405 (64)	2314 (89)	< 0.001	1501 (79)	2123 (97)	< 0.001
Literacy level in local language			< 0.001			< 0.001
Highly literate	593 (25)	520 (19)		405 (17)	816 (34)	
Some reading and writing	1011 (43)	1470 (55)		941 (40)	1081 (45)	
Cannot read or write	585 (25)	467 (17)		437 (19)	264 (11)	
Unknown	163 (7)	217 (8)		554 (24)	264 (11)	
<b>Children ages 12-17</b>						
<i>Total children in all households (n)</i>	1230	1387		1057	1021	
Highest level of school attended			<0.001			0.94
Primary	752 (63)	760 (55)		767 (81)	787 (81)	
Secondary	278 (23)	409 (30)		141 (15)	169 (17)	
School attendance reported as "Always"	751 (63)	1184 (86)	<0.001	728 (77)	944 (97)	<0.001
Literacy level in local language			0.267			<0.001
Highly literate	332 (27)	361 (26)		234 (22)	409 (40)	
Some reading and writing	674 (55)	810 (58)		577 (55)	503 (49)	
Cannot read or write	142 (12)	91 (7)		76 (7)	27 (3)	
Unknown	82 (7)	125 (9)		170 (16)	82 (8)	

The table reports the number (no.) and (%) for each question in each wave. \*The p-value was estimated using a generalized estimating equation (GEE) that used robust standard errors to account for the clustering resulting from repeated measures of the same household over time.

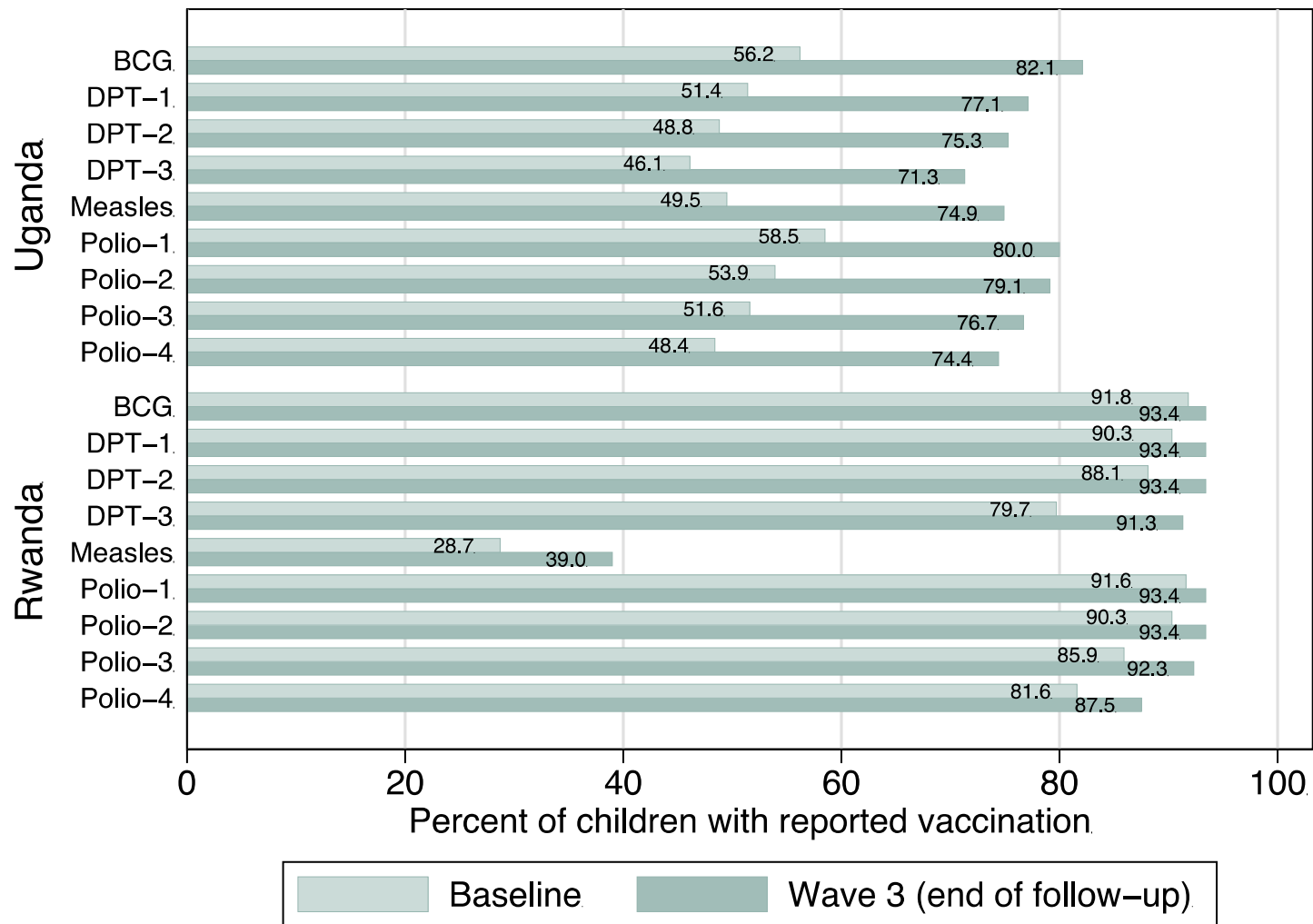
**Table 4: Household economics and durable goods, (2-years sample, n=1,540)**

	Uganda			Rwanda		
	Baseline	Wave 3	p-value for change*	Baseline	Wave 3	p-value for change*
Children have adequate school supplies <sup>1</sup>	24 (4)	444 (71)	< 0.001	65 (7)	883 (97)	< 0.001
Reason any child in household does not attend school						
Lack of financial means	357 (57)	38 (6)	< 0.001	277 (30)	1 (0)	< 0.001
Illness	50 (8)	21 (3)	< 0.001	47 (5)	3 (0)	< 0.001
Household assets						
Radio	362 (58)	486 (77)	< 0.001	368 (40)	746 (82)	< 0.001
Mobile phone	248 (39)	423 (67)	< 0.001	79 (9)	480 (53)	< 0.001
Bicycle	123 (20)	168 (27)	< 0.001	39 (4)	101 (11)	< 0.001
Furniture	353 (56)	442 (70)	< 0.001	231 (25)	600 (66)	< 0.001
Mattress	488 (78)	577 (92)	< 0.001	140 (15)	423 (46)	< 0.001
Refrigerator	33 (5)	30 (5)	0.681	6 (1)	7 (1)	0.782
Home	371 (59)	410 (65)	0.002	516 (57)	815 (89)	< 0.001
Additional Land	329 (52)	305 (49)	0.052	475 (52)	795 (87)	< 0.001
Small livestock	203 (32)	312 (50)	< 0.001	257 (28)	647 (71)	< 0.001
Large livestock	97 (15)	203 (32)	< 0.001	155 (17)	573 (63)	< 0.001
Workforce participation and training						
Household member works for outside enterprise	117 (19)	172 (27)	< 0.001	568 (62)	345 (38)	< 0.001
Household member works for themselves or the household	169 (27)	324 (52)	< 0.001	635 (70)	678 (74)	< 0.001
Microcredit training	197 (31)	606 (97)	< 0.001	40 (4)	844 (93)	< 0.001
Member of FXB income generation activity group –	1 (0)	473 (76)	< 0.001	256 (28)	897 (98)	< 0.001
Agriculture	4.0	48.1		17.8	68.2	
Livestock	2.1	60.5		2.0	27.7	
Commerce	0.8	6.8		0.3	2.0	

The table reports the number (no.) and (%) or median (IQR) for each question in each wave. \*The p-value was estimated using a generalized estimating equation (GEE) that used robust standard errors to account for the clustering resulting from repeated measures of the same household over time.

<sup>1</sup> This includes uniform, shoes, notebook, pencils, etc.



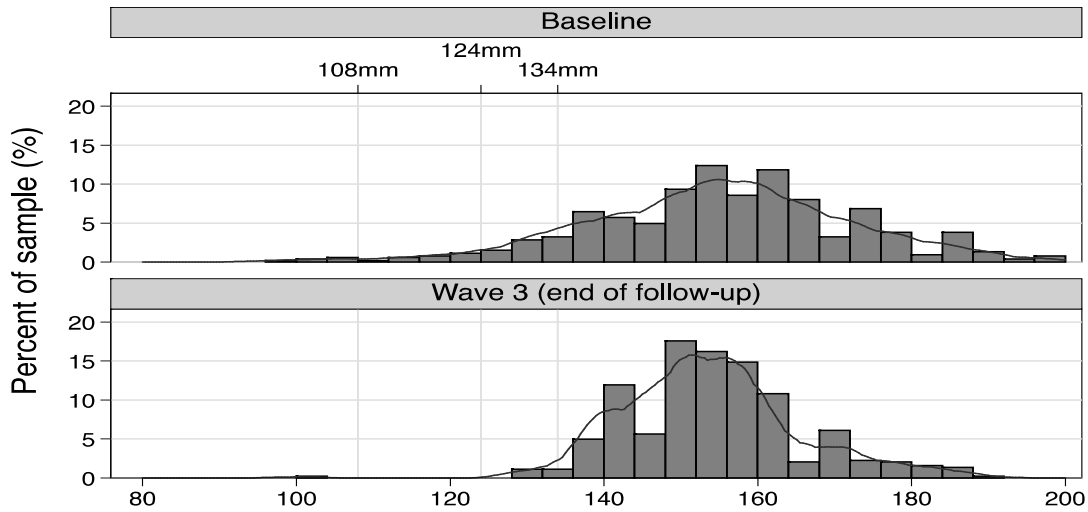


**Figure 1: Rates of vaccine coverage for children 12-59 months of age, by country**

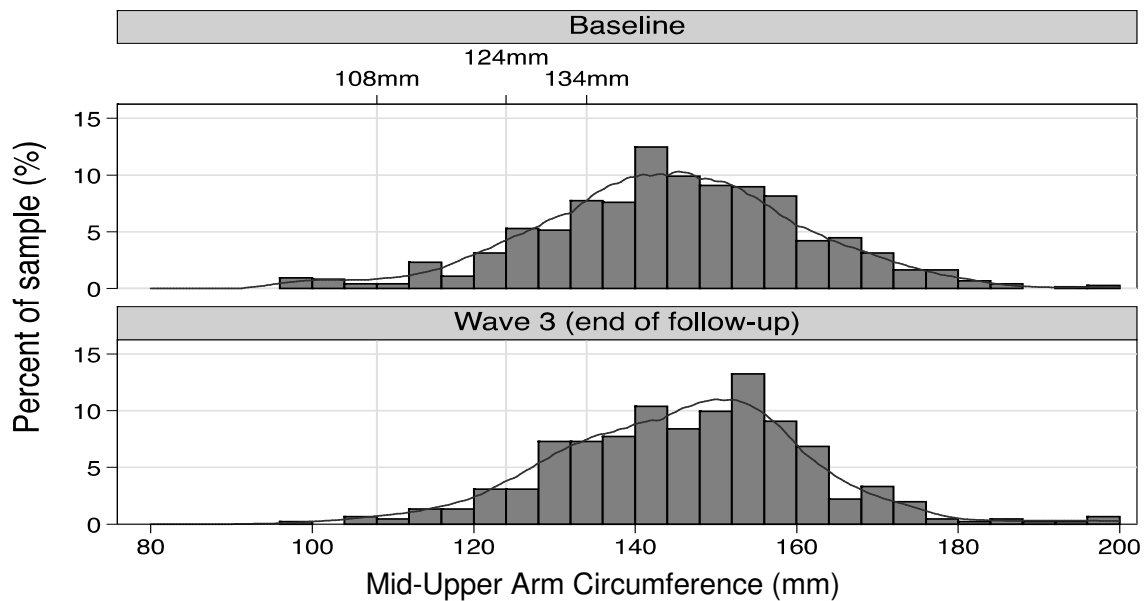
Notes: All children > 1 year of age were surveyed to acquire the status of their measles, bacille Calmette–Guérin (BCG), DTP (Diphtheria, Tetanus and Pertussis) [3 doses] and Polio [4 doses] vaccines using the WHO vaccination schedules.

**Figure 2: Distribution of mid-upper arm circumference in children 0-59 months, by country**

**A) Uganda**



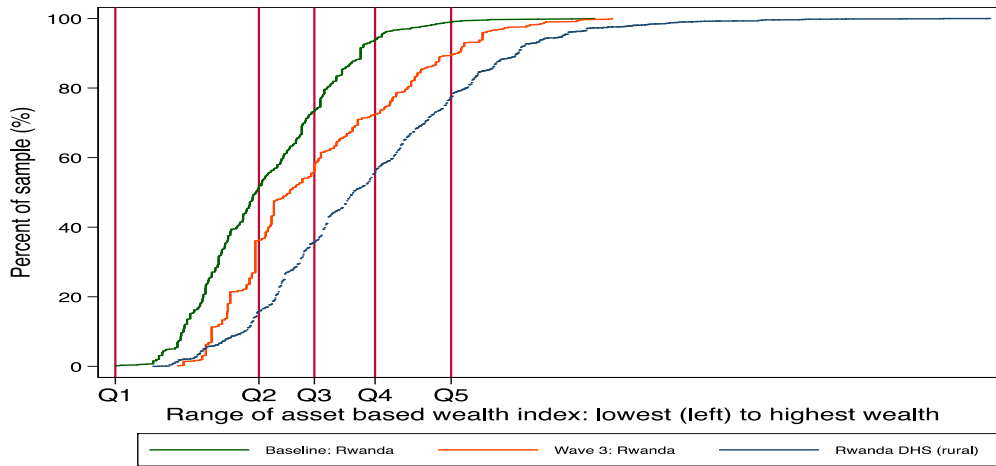
**B) Rwanda**



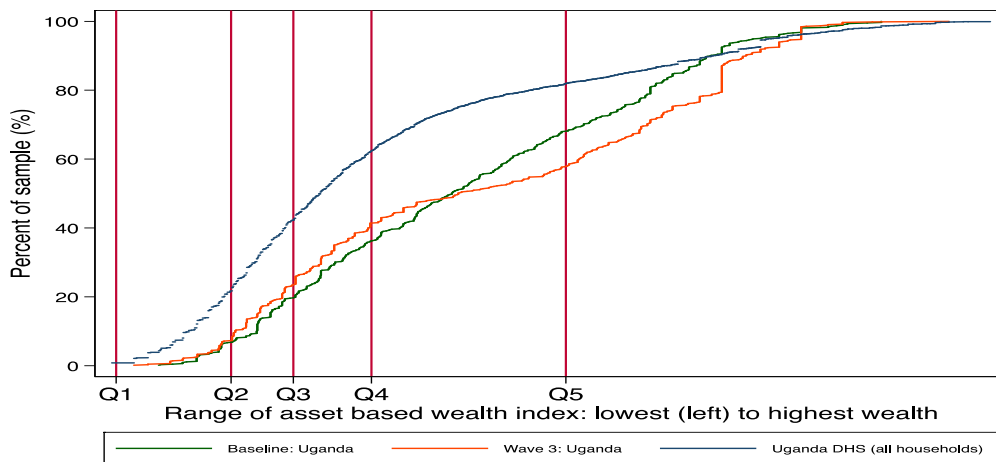
*Notes:* A two-sample Wilcoxon rank-sum (Mann-Whitney) test was used to compare the distributions at baseline and wave 3 in each country. This test was not paired, as child linkage overtime was not possible, as the sample was based on age brackets at the time of the survey. The p-values for this test were 0.059 in Rwanda and 0.0106 in Uganda. Each distribution is overlaid with a kernel density smoother to better depict their shape. As noted in the methods, there is no age-adjustment for this comparison.

<110mm = Severely malnourished,  
 <124mm = Moderately malnourished, and  
 <134mm = At risk of malnourishment.

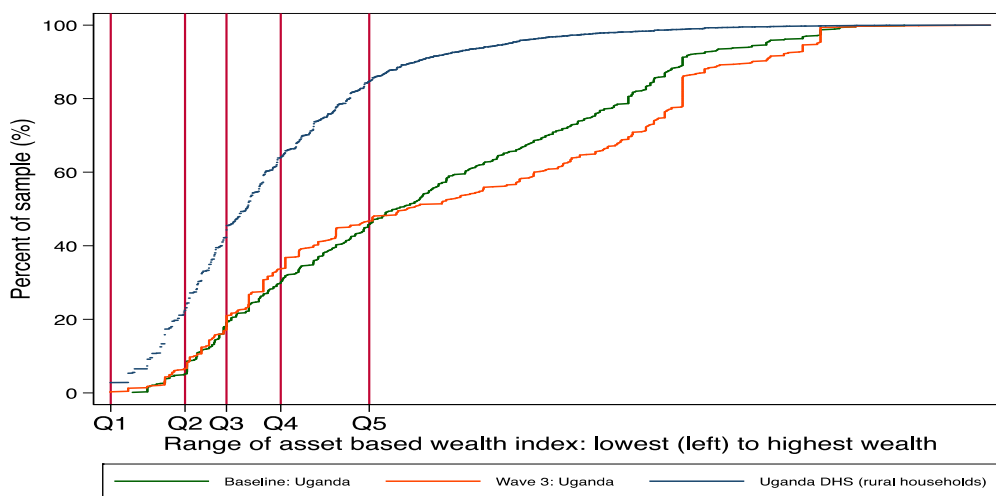
**Figure 3: Cumulative density functions of an asset-based wealth index in a pooled sample of FXBVillage and Demographic Health Survey (DHS) households**  
**A) Rwanda**



**B) Uganda, using all DHS households**



**C) Uganda, using all rural DHS households**



## Supplementary tables and methods

An assessment of the FXBVillage Program in Uganda and Rwanda

**S1 Table: Details about the FXBVillages program components**

Component	Details
Nutritional support	This consists of in-kind food support lasting 9 to 12 months in year 1
Health component	Health work includes provision of basic hygiene training and education (e.g. latrines, water supply, hygiene materials and use, family planning), focus on HIV/AIDS prevention, payment of health-related costs up to 100% in the first year, 75% in the second and 50% in the third
Education	The program identifies and potentially re-enrolls all school-aged children, pays school-related costs (including fees, uniforms and other materials) up to 100% in the first year, 75% in the second and 50% in the third, and provides close follow-up of children's school performance, and early childhood development.
Income generating activities (IGA)	IGA ideally provide beneficiaries with the opportunity to become self-sufficient and to raise and protect the orphans and vulnerable children in their care. Each family benefits from the availability of an in-kind grant worth 120 USD - 160 USD. <b>Key to the FXBVillage program is that participants do not need to pay back (or reimburse) this money to FXB in contrast to microcredit initiatives.</b> The IGA undertaken depends on the context (e.g. urban versus rural; other IGAs in the area). The IGA are distributed in two or three installments during the first year of the program and are meant to enable families to provide for their own needs.
Savings	Once enrolled, families must open a bank account to start savings. Participants are encouraged to save part of their income in order to cope with potential economic shocks. Savings are also done through beneficiary groups in which all heads of households are enrolled. Those groups consist of 8 to 12 people and main activities are savings and lending, collective IGA, and psychosocial support.
Housing	When needed, FXB provides material to rehabilitate or reconstruct houses. Latrine improvement is an integral part of the FXBVillage program.
Psychosocial support	Poverty, HIV, orphan status, poverty-related stigma, and associated issues are all life problems that affect the psychosocial status of people. In the FXBVillage program, psychosocial support sessions are held individually and collectively to encourage participants to seek help when they need it.
Technical skills training	Trainings are given on topics such as financial literacy, management, microcredit, diversification, bank account management, savings and investment, agricultural practice, kitchen garden management, cooperative creation, and Village Savings and Lending Groups.
Life skills coaching	Throughout the FXBVillage program, trainings are provided on a wide range of domains ranging from balanced diet, health practices, hygiene, HIV/AIDS, child rights, early childhood development, water treatment, family planning methods
Home visits	These are conducted weekly over the first 2 years, biweekly or monthly during the last year of implementation, in order to follow participants' progress in terms of economic and social well-being.

**S2 Table: Selected characteristics of targeted sample (n=1,597) at baseline**

	Uganda	Rwanda	All
<b>Educational attainment of primary caregiver*</b>			
No education	150 (23.5%)	301 (31.4%)	451 (28.2%)
Some primary school (not completed)	258 (40.4%)	345 (36.0%)	603 (37.8%)
Finished primary school	100 (15.6%)	233 (24.3%)	333 (20.9%)
Some secondary school (not completed)	88 (13.8%)	35 (3.7%)	123 (7.7%)
Finished secondary school	23 (3.6%)	4 (0.4%)	27 (1.7%)
<b>Marital status of primary caregiver*</b>			
Married	107 (16.7%)	434 (45.3%)	541 (33.9%)
Co-habiting	43 (6.7%)	95 (9.9%)	138 (8.6%)
Single	43 (6.7%)	86 (9.0%)	129 (8.1%)
Separated	56 (8.8%)	21 (2.2%)	77 (4.8%)
Divorced	10 (1.6%)	55 (5.7%)	65 (4.1%)
Widowed	372 (58.2%)	252 (26.3%)	624 (39.1%)
<b>Household description</b>			
Mother and father living in household	125 (19.6%)	471 (49.2%)	596 (37.3%)
Single mother	122 (19.1%)	52 (5.4%)	174 (10.9%)
Single father	9 (1.4%)	3 (0.3%)	12 (0.8%)
Grandparent-headed household	21 (3.3%)	2 (0.2%)	23 (1.4%)
Widow/widower-headed household	325 (50.9%)	284 (29.6%)	609 (38.1%)
Child-headed household	36 (5.6%)	59 (6.2%)	95 (5.9%)
<b>Primary caregiver occupation</b>			
None	109 (17.6%)	27 (2.8%)	136 (8.5%)
Food vendor	131 (20.5%)	30 (3.1%)	161 (10.1%)
Agriculture	233 (36.5%)	806 (84.1%)	1,039 (65.1%)
Number of household members – median (IQR)	6 (5-8)	6 (5-7)	6 (5-7)
Number of orphans – mean (SD)	2.83 (2.2)	1.04 (1.5)	1.76 (2.0)
Number of beds – mean (SD)	2.47 (1.7)	1.25 (1.1)	1.73 (1.5)
All members of household regularly sleep on beds	134 (21.0%)	326 (34.0%)	460 (28.8%)

\*These subsections only include the largest categories and as such may not add to exactly 100%.

**S3 Table: Summary of pooled (Uganda and Rwanda) changes among all domains, (2-years sample, n=1,540)**

	Baseline	Wave 3	p-value for change*
<b>Nutrition (in the past 3 months)</b>			
3 or more meals per day on average – no. (%)	321 (21)	1342 (87)	< 0.001
Household had a day with no food – no. (%)	967 (63)	75 (5)	< 0.001
Quantity of food available for household deemed "plenty" or "just enough" – no. (%)	366 (24)	1438 (93)	< 0.001
Food consumed by household has been mostly home grown – no. (%)	534 (35)	1060 (69)	< 0.001
<b>General Health</b>			
Currently has access to healthcare services <sup>1</sup> – no. (%)	1316 (86)	1527 (99)	< 0.001
Travel time to nearest health care facility – no. (%)			< 0.001
<30min	444 (29)	905 (59)	
30-60min	521 (34)	497 (32)	
>1hr	562 (37)	137 (9)	
Access to free health care in past 6 months – no. (%)	425 (28)	1439 (93)	< 0.001
Reported having health insurance in past 6 months – no. (%)	720 (49)	1010 (66)	< 0.001
No episodes of diarrhea for a child <5yrs in household in the past month <sup>2</sup> – no. (%)	989 (64)	1479 (96)	< 0.001
Reported no overnight hospital stays due to an episodes of diarrhea of a child <5yrs living in household in the past month <sup>2</sup> – no. (%)	1241 (81)	1529 (99)	< 0.001
No episodes of severe cough or difficulty breathing for a child <5yrs in household in the past month – no. (%)	1086 (71)	1507 (98)	< 0.001
Reported no overnight hospital stays due to severe cough or difficulty breathing of a child <5yrs living in household in the past month – no. (%)	1257 (82)	1531 (99)	< 0.001
<b>Health and HIV</b>			
Head of household has been tested for HIV – no. (%)	1091 (71)	1521 (99)	< 0.001
Reports to know of family planning (birth control) methods – no. (%)	959 (62)	1451 (94)	< 0.001
Reports to have used methods of family planning <sup>3</sup> – no. (%)	644 (67)	1003 (69)	0.003
<b>Water and sanitation</b>			
Received education and training about hygiene and sanitation – no. (%)	649 (42)	1531 (99)	< 0.001

Takes >30min to acquire potable water and return – no. (%)	352 (23)	205 (13)	< 0.001
Household treats water to make it safer to drink – no. (%)	929 (60)	1525 (99)	< 0.001
Uses flush or ventilated improved pit latrine as toilet facility – no. (%)	284 (18)	978 (64)	< 0.001
Cooking facilities have appropriate ventilation – no. (%)	592 (41)	1454 (96)	< 0.001
Reports ownership of a bednet for use in household <sup>a</sup> – no. (%)	783 (51)	1522 (99)	< 0.001

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### Psychosocial and subjective well-being of head of household

#### General thoughts and feelings about life – no. (%)

Reports to "never" feel that they have a good sense of what makes life meaningful	147 (10)	2 (0)	< 0.001
Reports to "never" feel that they have discovered a satisfying purpose in life	199 (13)	3 (0)	< 0.001
Reports to "never" think of many strategies to get out of difficult situations	316 (21)	3 (0)	< 0.001
Reports to "never" feel that there are not many ways around a problem	279 (18)	6 (0)	< 0.001
Reports to "never" think of ways to get the things in life that are important to them	105 (7)	4 (0)	< 0.001
Reports to "never" have difficulty finding a way to solve problems even when those around them get discouraged.	167 (11)	14 (1)	< 0.001

#### Questions about day-to-day life – no. (%)

Reports to "never" have difficulty with usual activities, such as self-care, work or recreation.	511 (33)	1005 (65)	< 0.001
Reports to "never" have a day in the past month where they have not felt healthy	217 (14)	67 (4)	< 0.001
Reports that they have a confidant (someone who they can talk about personal feelings and life events).	925 (60)	1516 (98)	< 0.001
Reports that they have a someone who can lend or give them money if they need it	426 (28)	1438 (93)	< 0.001
Respondent has someone they could stay with if they needed somewhere to go	647 (42)	1436 (93)	< 0.001
Reports they are currently receiving regular counseling or advice	653 (42)	1523 (99)	< 0.001

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### Children in the FXB household, ages 0-17 years

#### Children < age 5 (0-59 months)

<i>Total children in all households (n)</i>	<i>1333</i>	<i>931</i>	
Has been tested for HIV – no. (%)	252 (19)	607 (65)	< 0.001
Able to produce immunization card to staff – no. (%)	770 (58)	745 (80)	< 0.001
Immunization card up-to-date – no. (%)	663 (50)	726 (78)	< 0.001
Child has symptoms of kwashiorkor – no. (%)	185 (14)	10 (1)	< 0.001

#### Children ages 5-17

<i>Total children in all households (n)</i>	<i>4689</i>	<i>5099</i>	
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Official birth registration – no. (%)	2556 (55)	3157 (62)	< 0.001
Has been tested for HIV – no. (%)	1112 (24)	4385 (86)	< 0.001
Currently enrolled in school – no. (%)	3680 (78)	4451 (87)	< 0.001
School attendance reported as "Always" – no. (%)	2906 (71)	4437 (93)	< 0.001
Literacy level in local language – no. (%)			< 0.001
Highly literate	998 (21)	1336 (26)	
Some reading and writing	1952 (42)	2551 (50)	
Cannot read or write	1022 (22)	731 (14)	
Unknown	717 (15)	481 (9)	

### Children ages 12-17

<i>Total children in all households (n)</i>	<i>2287</i>	<i>2408</i>	
Highest level of school attended – no. (%)			0.019
Primary	1519 (71)	1547 (66)	
Secondary	419 (20)	578 (25)	
School attendance reported as "Always" – no. (%)	1479 (69)	2128 (91)	<0.001
Literacy level in local language – no. (%)			<0.001
Highly literate	566 (25)	770 (32)	
Some reading and writing	1251 (55)	1313 (55)	
Cannot read or write	218 (10)	118 (5)	
Unknown	252 (11)	207 (9)	

The table reports the number (no.) and (%) for each question in each wave. \*The p-value was estimated using a generalized estimating equation (GEE) that used robust standard errors to account for the clustering resulting from repeated measures of the same household over time.

**S4 Table: Household nutrition, health, water and sanitation characteristics among 510 households surveyed at each wave**

	Uganda					Rwanda					Households with missing data (sum of all waves)
	Baseline	Wave 1	Wave 2	Wave 3	p-value for linear trend*	Baseline	Wave 1	Wave 2	Wave 3	p-value for linear trend*	
<b>Nutrition (in the past 3 months)</b>											
3 or more meals per day on average – no. (%)	106 (48)	181 (82)	174 (79)	192 (87)	< 0.001	12 (4)	124 (43)	225 (78)	259 (89)	< 0.001	0
Household had a day with no food – no. (%)	96 (44)	23 (10)	12 (5)	15 (7)	< 0.001	206 (71)	45 (16)	6 (2)	6 (2)	< 0.001	0
Quantity of food available for household deemed "plenty" or "just enough" – no. (%)	49 (22)	154 (70)	171 (78)	202 (92)	< 0.001	79 (27)	250 (86)	286 (99)	276 (95)	< 0.001	0
Food consumed by household has been mostly home grown – no. (%)	101 (46)	113 (51)	112 (51)	111 (50)	0.044	76 (26)	176 (61)	217 (75)	239 (82)	< 0.001	0
<b>General Health</b>											
Currently has access to healthcare services <sup>1</sup> – no. (%)	193 (88)	216 (98)	215 (98)	218 (99)	< 0.001	253 (87)	285 (98)	288 (99)	288 (99)	< 0.001	0
Travel time to nearest health care facility – no. (%)					< 0.001					< 0.001	10
<30min	74 (34)	135 (62)	140 (64)	137 (62)		77 (27)	115 (40)	141 (49)	150 (52)		
30-60min	28 (13)	20 (9)	26 (12)	60 (27)		152 (52)	134 (46)	120 (41)	108 (37)		
>1hr	115 (53)	62 (29)	52 (24)	23 (10)		61 (21)	40 (14)	29 (10)	31 (11)		
Access to free health care in past 6 months – no. (%)	101 (46)	205 (96)	210 (97)	206 (94)	< 0.001	45 (16)	227 (79)	155 (53)	269 (93)	< 0.001	11
Reported having health insurance in past 6 months – no. (%)	17 (8)	48 (24)	37 (17)	37 (17)	0.043	220 (77)	276 (96)	265 (91)	288 (99)	< 0.001	47
Zero episodes of diarrhea for a child <5yrs in household in the past month <sup>2</sup> – no. (%)	115 (52)	179 (81)	211 (96)	205 (94)	< 0.001	219 (76)	263 (91)	287 (99)	282 (97)	< 0.001	1
Reported zero overnight hospital stays due to an episodes of diarrhea of a child <5yrs living in household in the past month <sup>2</sup> – no. (%)	135 (61)	190 (86)	218 (99)	216 (99)	< 0.001	277 (96)	284 (98)	289 (100)	288 (99)	0.002	1
Zero episodes of severe cough or difficulty breathing for a child <5yrs in household in the past month – no. (%)	123 (56)	178 (81)	215 (98)	212 (97)	< 0.001	237 (82)	264 (91)	284 (98)	286 (99)	< 0.001	1
Reported no overnight hospital stays due to severe cough or difficulty breathing of a child <5yrs living in household in the past month – no. (%)	138 (63)	193 (88)	216 (98)	218 (100)	< 0.001	274 (94)	285 (98)	289 (100)	288 (99)	< 0.001	1
<b>Health and HIV</b>											
Head of household has been tested for HIV – no. (%)	145 (66)	189 (86)	202 (92)	215 (98)	< 0.001	223 (77)	288 (99)	287 (99)	289 (100)	< 0.001	0
Reports to know of family planning (birth control) methods – no. (%)	127 (58)	172 (78)	171 (78)	193 (88)	< 0.001	197 (68)	277 (96)	285 (98)	284 (98)	< 0.001	0
Reports to have used methods of family planning <sup>3</sup> – no. (%)	78 (61)	99 (58)	91 (53)	117 (61)	0.065	126 (64)	192 (69)	208 (73)	215 (76)	< 0.001	37
<b>Water and sanitation</b>											
Received education and training about hygiene and sanitation – no. (%)	123 (56)	218 (99)	217 (99)	219 (100)	< 0.001	88 (30)	269 (93)	285 (98)	290 (100)	< 0.001	0
Takes >30min to acquire potable water and return – no. (%)	52 (25)	49 (23)	47 (22)	37 (17)	0.02	61 (21)	37 (13)	20 (7)	36 (12)	< 0.001	34
Household treats water to make it safer to drink – no. (%)	103 (47)	218 (99)	216 (98)	217 (99)	< 0.001	198 (68)	283 (98)	288 (99)	288 (99)	< 0.001	0
Uses flush or ventilated improved pit latrine as toilet facility – no. (%)	26 (12)	41 (19)	39 (18)	35 (16)	0.219	63 (22)	284 (98)	262 (90)	273 (94)	< 0.001	0
Cooking facilities have appropriate ventilation – no. (%)	96 (48)	179 (84)	202 (93)	209 (96)	< 0.001	77 (28)	231 (81)	270 (95)	273 (96)	< 0.001	62
Reports ownership of a bednet for use in household <sup>4</sup> – no. (%)	98 (45)	215 (98)	217 (99)	214 (98)	< 0.001	155 (53)	289 (100)	287 (100)	290 (100)	< 0.001	10

The table reports the number (no.) and percentage (%) for each outcome of interest across the four waves in the random sub-sample. The percentages represent the prevalence of the response among those who had a recorded answer to the survey question. The frequency of missing data is indicated in the final row of this table, and was generally limited and non-deferential across waves.

\*The p-value was estimated using a generalized estimating equation (GEE) that used robust standard errors to account for the clustering resulting from repeated measures on the same household over time. We a priori choose to examine for evidence of a linear trend, as quadratic or cubic trends would be difficult to isolate with only 4 time periods.

<sup>1</sup> For example, access to vaccinations for children, care in the event of fever or diarrhea.

<sup>2</sup> Diarrhea is defined here as having three or more loose or watery stools in one day.

<sup>3</sup> Only women who reported that they knew of family planning methods were asked to respond to this question.

<sup>4</sup> Includes both un-treated and insecticide-treated bednets.

**S5 Table: Psychosocial and subjective well being of head of household (2-years sample, n=1,540 households)**

	Uganda			Rwanda		
	Baseline	Wave 3	p-value for change*	Baseline	Wave 3	p-value for change*
<b>General thoughts and feelings about life – no. (%)</b>						
Reports to "never" feel that they have a good sense of what makes life meaningful	58 (9)	1 (0)	< 0.001	89 (10)	1 (0)	< 0.001
Reports to "never" feel that they have discovered a satisfying purpose in life	53 (8)	3 (0)	< 0.001	146 (16)	0 (0)	< 0.001
Reports to "never" think of many strategies to get out of difficult situations	78 (12)	3 (0)	< 0.001	238 (26)	0 (0)	< 0.001
Reports to "never" feel that there are not many ways around a problem	66 (11)	6 (1)	< 0.001	213 (23)	0 (0)	< 0.001
Reports to "never" think of ways to get the things in life that are important to them	51 (8)	4 (1)	< 0.001	54 (6)	0 (0)	< 0.001
Reports to "never" have difficulty finding a way to solve problems even when those around them get discouraged	58 (9)	10 (2)	< 0.001	109 (12)	4 (0)	< 0.001
<b>Questions about day-to-day life – no. (%)</b>						
Reports to "never" have difficulty with usual activities, such as self-care, work or recreation	132 (21)	246 (39)	< 0.001	379 (42)	759 (83)	< 0.001
Reports to "never" have a day in the past month where they have not felt healthy and full of energy	120 (19)	31 (5)	< 0.001	97 (11)	36 (4)	< 0.001
Reports that they have a confidant (someone who they can talk about personal feelings and life events)	429 (68)	614 (98)	< 0.001	496 (54)	902 (99)	< 0.001
Reports that they have a someone who can lend or give them money if they need it	184 (29)	547 (87)	< 0.001	242 (27)	891 (98)	< 0.001
Reports they could stay with if they needed somewhere to go	181 (29)	535 (85)	< 0.001	466 (51)	901 (99)	< 0.001
Reports they are currently receiving regular counseling or advice	227 (36)	613 (98)	< 0.001	426 (47)	910 (100)	< 0.001

The table reports the number (no.) and (%) that responded to the reported response for each question in each wave. \*The p-value was estimated using a generalized estimating equation (GEE) that used robust standard errors to account for the clustering resulting from repeated measures of the same household over time.

**S6 Table: Assets measures in both the FXBVillages and 2010-11 DHS in Rwanda**

	Rwanda FXB-baseline	Rwanda FXB-wave 3	% Change	Rwanda (all) 2010-11 DHS	FXB baseline difference	FXB wave 3 difference	Decrease in difference
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Calculation	(1)	(2)	(2)-(1)	(4)	(4)-(1)	(4)-(2)	(6)-(5)
Asset/household characteristic							
Shared sanitation facility	14%	5%	-9%	22%	-8%	-17%	-9%
Household has flush toilet	1%	1%	0%	2%	-1%	-1%	0%
Ventilated improved pit latrine (VIP)	20%	93%	74%	2%	18%	92%	74%
Pit latrine with slab	1%	1%	-1%	71%	-70%	-71%	-1%
Pit latrine without slab	62%	5%	-57%	23%	39%	-17%	-57%
Household water source <30min away	22%	12%	-10%	34%	-12%	-22%	-10%
Household water source <15min away	61%	54%	-8%	72%	-11%	-19%	-8%
Water source: Piped water source in house	0%	1%	0%	5%	-5%	-5%	0%
Water source: public tap/standpipe	24%	33%	8%	26%	-2%	7%	8%
Water source: protected well	43%	44%	1%	2%	40%	41%	1%
Water source: protected spring	5%	19%	14%	38%	-33%	-19%	14%
Cook with electricity	2%	0%	-2%	0%	2%	0%	-2%
Cook with charcoal	1%	3%	1%	11%	-10%	-9%	1%
Cook with wood	85%	96%	11%	75%	9%	21%	11%
Owns livestock (large or small)	37%	83%	46%	57%	-20%	26%	46%
Owns cell phone	9%	53%	44%	41%	-33%	11%	44%
Owns bike	4%	11%	7%	15%	-11%	-4%	7%
Owns refrigerator	1%	1%	0%	2%	-1%	-1%	0%
Owns radio	40%	82%	41%	63%	-23%	19%	41%
Metal roof	8%	28%	20%	51%	-44%	-23%	20%
Ceramic tile roof	54%	69%	16%	42%	12%	27%	16%

All results are summarized as percentages or absolute difference between two percentages. DHS=Demographic Health Survey

**S7 Table: Assets measures in both the FXBVillages and 2010-11 DHS in Uganda**

	Uganda FXB-baseline	Uganda FXB-wave 3	% Change	Uganda (all) 2011 DHS	FXB baseline difference	FXB wave 3 difference	Decrease in difference
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Calculation	(1)	(2)	(2)-(1)	(4)	(4)-(1)	(4)-(2)	(6)-(5)
Asset/household characteristic							
Shared sanitation facility	42%	42%	0%	41%	1%	1%	0%
Household has flush toilet	6%	3%	-3%	3%	3%	0%	3%
Ventilated improved pit latrine (VIP)	10%	17%	7%	4%	6%	13%	-7%
Pit latrine with slab	39%	32%	-7%	29%	10%	3%	7%
Pit latrine without slab	39%	47%	8%	53%	-15%	-6%	-8%
Household water source <30min away	24%	16%	-8%	38%	-14%	-23%	8%
Household water source <15min away	52%	46%	-6%	70%	-19%	-24%	6%
Water source: Piped water source in house	3%	2%	-1%	5%	-3%	-3%	1%
Water source: public tap/standpipe	26%	30%	4%	16%	10%	14%	-4%
Water source: protected well	14%	21%	6%	34%	-19%	-13%	-6%
Water source: protected spring	16%	11%	-5%	18%	-2%	-7%	5%
Cook with electricity	2%	0%	-2%	1%	1%	-1%	2%
Cook with charcoal	41%	44%	4%	20%	21%	24%	-4%
Cook with wood	55%	54%	-2%	76%	-21%	-23%	2%
Owns livestock (large or small)	35%	52%	17%	64%	-30%	-13%	-17%
Owns cell phone	39%	67%	28%	55%	-16%	12%	-28%
Owns bike	20%	27%	7%	38%	-18%	-11%	-7%
Owns refrigerator	5%	5%	0%	5%	1%	0%	0%
Owns radio	58%	77%	20%	64%	-6%	13%	-20%
Metal roof	89%	78%	-11%	0%	89%	78%	11%
Ceramic tile roof	0%	0%	0%	1%	-1%	-1%	0%

All results are summarized as percentages or absolute difference between two percentages. DHS=Demographic Health Survey

## **Text S1-Extended materials and methods**

Harhay et al, An assessment of the FXBVillage Program in Uganda and Rwanda

This document seeks to provide additional information on the FXBVillage program and the methods used in the pre/post analyses reported in the manuscript.

### **Extended Materials and Methods**

#### *Selection of FXBVillages*

The FXBVillages program has operated in Burundi, China, Colombia, India, Rwanda and Uganda. With some local adaptation, the pre-selection process for an FXBVillages program starts when local administrators and governors throughout the country request assistance from FXB for their most vulnerable families. FXB then meets with NGOs and other stakeholders and local associations to assess the needs of the different locations. This discussion allows FXB to get a clear sense of interventions already being implemented in these locations, to avoid conflicting efforts. Once FXB has chosen the regions in which to implement its programs, it meets with local officials to begin the process of selecting beneficiaries.

The selection process begins with the local government generating a list of the most vulnerable families within a given community. In the areas where FXB is active, the local government and other authorities are aware of the program, including its objectives and rules for inclusion or exclusion. The list provided includes about 200 potential beneficiaries.

Once FXB receives this list, field workers (social workers, nurses, and sometimes a unit manager selected for experience and interpersonal skills and trained by FXB staff members) visit each household individually to evaluate the level of vulnerability and degree of qualification for the program. FXB staff explains the program's objectives and requirements (which include e.g. time commitment to training and group activities, openness with staff, opening of a bank account) as well as the various components of the program: FXB is a Swiss NGO that works for destitute households with children affected by HIV or at risk of becoming infected; its goal is to prevent the spread of HIV and to fight poverty and towards this end, the program provisions each household with an income generating activity, aiming for better nutrition, healthcare, education, and treatment access, as well as enrollment in a health insurance program (if available) and frequent counseling for the entire family. This is explained both orally and with a written letter distributed on each visit.

To evaluate the level of vulnerability and qualification of each family, field workers utilize a simple but comprehensive questionnaire designed to measure several domains related to the state of the household. In Uganda the questionnaire is in the form of an OVC Vulnerability Index Tool, provided by the government. (See the selection tool for Uganda below; in Rwanda a government-issued tool does not exist but FXB has generated one similar.) This form documents basic information about the head of household, such as name, age, gender, marital status, and location of his or her home. It also includes the head of household's educational level and health status. The aspects of health status that are of particular interest to FXB include any mental disabilities, HIV status, and treatment with anti-retrovirals (ARVs) or bactrim. Lack of enrollment in a health insurance program is also a measure of vulnerability. The form also documents the socio-economic status of the household, describing the type of home, the means of generating income, previous training in this income generating activity, family difficulties, possible solutions to the current problems (as suggested by the beneficiary), and the opinion of the community on the family's integrity. The form also includes information on each person living in the home, including name, age, educational status and level, occupation, relation within the family, health status, vaccination status, and HIV status.

Once this form has been completed for each potential beneficiary on the original list, the field team reviews the candidates and selects based on a variety of criteria. The most important requirement for inclusion is degree of vulnerability, which can be measured by such factors as the number of school-aged children, a poor health status for the head of household (such as being HIV positive), and family problems that make generating sufficient income more difficult or impossible.

Candidates may also be excluded if they do not display sufficient commitment to the objectives of the FXB program or do not seem to be adequately motivated to work towards increased self-sufficiency. Beneficiaries must show future potential to work: many are too sick or too weak to work when the program begins, but with consistent nutritional and health support, they are able to regain strength and motivation.

FXB notifies families selected into the program and begins the initial stage of the FXB Village Program. Before choosing an income generating activity, FXB conducts extensive training on income generating activity (IGA) management to ensure future success. The staff then helps beneficiaries to choose IGAs that will be lucrative within the community. Other initial steps of the program include providing school fees (when required) and educational material for children, and beginning regular counseling with an FXB social worker and nurse counselor. Those that will not be included in the new program are notified by the local authorities, who explain the reasons for exclusion. Unfortunately, the budget of FXB forces the program to be limited to 80 families per program, but the remaining members on the list of 200 who were not selected are often reconsidered for future programs.

#### *GEE model specification*

Since a number of the binary indicators we examined had baseline prevalence greater than 10%, we used a generalized linear model with a binomial response and a log link function (log-binomial). To compare costs we also used a log link, but with a gamma distribution to account for the distribution.

#### *Empirical construction of a wealth index*

The asset-based wealth index seeks to capture household wealth, not income or expenditures, and does so because the latter is susceptible to several potential reporting and measurement biases, whereas the household wealth score is based on observable assets [1-4]. Common assets in the DHS surveys has been previously detailed [1]. The steps of constructing a wealth index begin with the determination of indicator variables (with general and country specific considerations [1, 3]), dichotomization of these indicator variables [5], and then the calculation of indicator weights and the index value [3-5]. The asset or wealth indices are constructed using principal components or factor analysis. In the case of principal component analysis, the asset index,  $A_i$ , for individual  $i$  is defined as follows:  $A_i = \sum_k [f_k ((a_{ik} - \bar{a}_k)/s_k)]$ , where  $a_{ik}$  is the value of asset  $k$  for household  $i$ ,  $\bar{a}_k$  is the sample mean,  $s_k$  is the sample standard deviation, and  $f_k$  are the weights associate with the first principal component [5]. This index can be computed easily with sample syntax available in references [4, 5] using the methods outlined by the DHS program [1, 2].



## Selection tool used in Uganda

### Uganda OVC Vulnerability Index Tool

The Uganda OVC Vulnerability Index (VI) is intended for the selection of vulnerable households into OVC programs. The tool helps to determine a household's level of vulnerability (slight, moderate, and critical) based on individual and household level questions you will ask across all core program areas.

#### SELECTION CRITERIA

**INSTRUCTIONS:** Please use the following indicators to pre-select households where the VI tool will be administered. Pre-selection of vulnerable households requires the participation of community members and community workers. This ensures that the selection process is conducted in an efficient and transparent manner if critically and moderately vulnerable are to be identified.

HOUSEHOLD HEALTH STATUS			
		Yes	No
1.	Does the household have <b>ANY</b> member who has been very sick for at least three months during the past 12 months? <i>(By very sick, I mean that the household head or any adult member was too sick to work or do normal activities around the house for at least three of the past 12 months)</i>		
2.	Does the household have <b>ANY</b> severely disabled person? <i>(Applies to both children and adult household members)</i>		
CHILD EDUCATION STATUS			
3.	Does the household have children not currently enrolled in school? <i>(Children between the ages of 3-17 years)</i>		
HOUSEHOLD ORPHANHOOD STATUS			
4.	Does the household have or care for any orphans?		

**DECISION:** If you selected "Yes" for at least ONE of the pre-selection criteria questions above, please proceed to administer the remainder of the tool at this household.

DISTRICT:		Household number:	
SUBCOUNTY:		No. of people in household:	____(0-5 yrs) ____ (6-17 yrs) ____ (18-65 yrs) ____ (65+ yrs)
PARISH:		Household head's age	____ Years
VILLAGE:		Household head's sex	1. Male      2. Female
INTERVIEWER:		Household head's educ. level	1. None   2. Primary   3. Secondary   4. Tertiary
INTERVIEWER DATE	/ / /	Household head's marital status	1. Single   2. Married/cohabiting   3. Widowed 4. Separated/Divorced

**INDEX CHILD SELECTION:** Please write down all the children in the household by capturing the information below. For each of the vulnerability categories, enter Yes or No accordingly, at the end indicate which child has been identified as index. The index child is one with many vulnerability categories. If a boy and a girl get similar scores, choose a girl as an index child **[Read the user guide for more about child index identification]**

Name of Child	Sex	Age	Out of school	Disabled	Chronically ill	Orphan	Index (Y/N)
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							

## HOUSEHOLD INFORMATION

**INSTRUCTIONS:** Please administer this section to heads of households, spouses, or to OVC in case of child-headed households. Ask each question and circle the appropriate response option. After circling the response, please write in the corresponding score to in the far right-hand column (labeled "SCORE").

At the end of each CPA, please add up the scores for all questions and write them down under the "CPA TOTAL" row. Finally, add up all CPA scores, and enter them under "HOUSEHOLD TOTAL SCORE".

										SCORE		
<b>CPA 1: ECONOMIC STRENGTHENING</b>												
<b>1.</b>	<b>Who is the MAIN household income earner?</b>											
<b>Option</b>	Children (6 – 17 years)		Grand or Elderly Parents			Relatives		Mother	Father			
<b>Score</b>	4		3			2		1	0			
<b>2.</b>	<b>What is the MAIN SOURCE of household income? (emphasis is main source only)</b>											
<b>Option</b>	None	Remittances	Causal Labourer	Informal Employment	Peasantry /hiring out labour	Petty Business/Cash transfer	Formal Business	Commercial Farming	Formal Employment / Wage			
<b>Score</b>	4	3	2	2	2	1	0	0	0			
<b>3.</b>	<b>What is the current monthly household income? (Uganda Shillings)</b>											
<b>Option</b>	Less than 50,000		50,000 – 100,000		100,000 – 150,000		150,000 – 200,000		Above 200,000			
<b>Score</b>	4		3		2		1		0			
<b>4.</b>	<b>In the last 12 months (MENTION THE MONTH), did the household experience any adverse event that led to an economic loss? (e.g. job loss, death in household, displacement, loss of property, etc.)</b>											
<b>Option</b>	Yes, involved loss of household bread winner or key household source of income				Yes, involved loss of some property or family member			Yes, but family is able to cope		None		
<b>Score</b>	4				3			1				
<b>5.</b>	<b>Does the household head or caregiver have any form of disability? (e.g., physical, speech, visual, hearing, or mental handicap?)</b>											
<b>Option</b>	Yes, not able to perform any economic activity/too old to do any work				Yes, but need some support to do light work			Yes, has slight disability but can do some light work		None		
<b>Score</b>	4				3			1		0		
<b>6.</b>	<b>Is this household able to do/pay/access the following services without difficulty?</b>											
	a. Medical services? (Yes/No)											
	b. Pay for education, all children aged 5-17 years are in school (Yes/No)											
	c. Buy farm inputs (Yes/No)											
	d. Produce/buy food (Yes/No)											
	e. Access land for production (Yes/No)											
<b>Option</b>	If ALL are NO		If Three are NO			If Two are NO		If One is NO		If All are Yes		
<b>Score</b>	4		3			2		1		0		
<b>7.</b>	<b>Do these statements apply to this household? (Yes/No)</b>											
	a. At least one of the household members owns an electronic gadget (Radio, Phone, TV)											
	b. At least one member of the household has transport means (bicycle, motor cycle, car)											
	c. At least one member of the household has vocational/apprenticeship/professional skills											
	d. At least one member of the household has formal employment of is self-employed or has a business											
<b>Option</b>	If ALL are NO		If Three are NO			If Two are NO		If One is NO		If All are Yes		
<b>Score</b>	4		3			2		1		0		
<b>CPA 1 TOTAL *</b>												
<b>CPA 2: FOOD SECURITY AND NUTRITION</b>												
<b>8.</b>	<b>Over the past month (MENTION THE MONTH), what has been the MAIN source of food consumed by your household?</b>											
<b>Option</b>	Donated	Given in return for work			Bought from the market			Home grown and given in return for work		Home grown		
<b>Score</b>	4	3			2			1		0		
<b>9.</b>	<b>Over the past month, did anyone in the household ever go without food for a whole day because</b>											

						SCORE
there wasn't enough?						
Option	More than five days	3-4 days	Two days	One day	Never	
Score	4	3	2	1	0	
<b>10. Does this household have access to land for agriculture?</b>						
Option	Does not own, not able to access land	Does not own, but able to access land	Owns but not able to access land	Owns and able to access land		
Score	4	2	1	0		
<b>CPA 2 TOTAL *</b>						
<b>CPA 3: HEALTH, WATER, SANITATION AND SHELTER</b>						
<b>11. Do the following apply to this household?</b>						
	a. Has access to safe water within a radius of 1 Km or harvests rain water (Yes/No)					
	b. Has a clean compound (Yes/No)					
	c. Has a drying rack for household utensils (Yes/No)					
	d. Has a garbage pit (Yes/No)					
	e. Separate house for animals (Yes/No)					
Option	If more than four NOs	If Three are NO	If Two are NO	If One is NO	If All are Yes	
Score	4	3	2	1	0	
<b>12. Are there any members [NOT INDEX CHILD] of the household who are chronically ill? (HIV+, Cancer, TB, Sickle cells etc)</b>						
Option	More than five members	3-4 members	Two members	One members	None	
Score	4	3	2	1	0	
<b>13. Does the household have a stable shelter that is adequate, safe, and dry? [Observe for yourself]</b>						
Option	No stable shelter , adequate or safe place to live	Shelter is not adequate, needs major repairs	Shelter needs some repairs but is fairly adequate, safe, and dry	Shelter is safe, adequate & dry		
Score	4	3	1	0		
<b>14. What is the type of a latrine/toilet facility used by members of your household?</b>						
Option	Bush/None	Public toilet for pay	Private needs some repair	Private but in risky state	Safe, adequate & dry	
Score	4	3	2	1	0	
<b>CPA 3 TOTAL *</b>						
<b>CPA 5: PSYCHOSOCIAL SUPPORT AND BASIC CARE</b>						
<b>15. In the last year, how often have you felt so troubled that you felt you needed to consult a spiritual, faith or traditional healer, counsellor or health worker?</b>						
Option	More than five times	3-4 times	Two times	Once	Never	
Score	4	3	2	1	0	
<b>CPA 5 TOTAL *</b>						
<b>CPA 6: CHILD PROTECTION AND LEGAL SUPPORT</b>						
<b>16. What would you do if any of your children experienced or became a victim of any form of child abuse or violence?</b>						
Option	Nothing/negotiate with offender	Talk to neighbour / family only	Report to LC/Police/Probation, CDO, Human rights office			
Score	4	1	0			
<b>17. In the past 12 months (STATE MONTH), have you or another adult in the household used the following method of discipline with any family member in your household? (Please select all the methods that apply)</b>						
				<input type="checkbox"/> Punched, kicked or hit with a stick <input type="checkbox"/> Withheld a meal to punish <input type="checkbox"/> Using abusive words/language		
Option	If TWO or MORE of the methods are checked	If at least ONE of the methods is checked		If NONE of the methods are checked		
Score	4	1		0		
<b>CPA 6 TOTAL *</b>						
<b>HOUSEHOLD TOTAL SCORE (ALL CPAs) *</b>						

## INDIVIDUAL INFORMATION

**INSTRUCTIONS:** Please administer this section to the index child in the household. An index child should be one with the most vulnerability factors (orphan hood, disability, out of school, chronic illness). In particular, please interview the caregiver if the child is 12 years of age or below. **Children who are 13 years and above should answer for themselves.** Ask each question and write in the corresponding score for each child under his/her respective column (labeled "SCORES").

At the end of each CPA, please add up the scores for all questions and write them down under the "CPA TOTAL" row for **each** child. Finally, add up all CPA scores, and enter them under "INDIVIDUAL TOTAL SCORE" for child.

						SCORES
<b>Child's Name</b>						
<b>Child's Identification Number</b>						
<b>Child's age (in years)</b>						
<b>Child's sex (M=male, F=Female)</b>						
<b>CPA 2: FOOD SECURITY AND NUTRITION</b>						
1.	<b>How many meals (including breakfast) has (Name) had in the past 24 hours? (SKIP to CPA 3 if child is breast feeding)</b>					
<b>Option</b>	None	One meal	Two meals	Three meals or more		
<b>Score</b>	4	3	1	0		
2.	<b>What does the child usually eat? Write down "Yes" or "No" for each type of food consumed by the child.</b> <b>Instructions:</b> <ul style="list-style-type: none"> <li>• Applicable to children of all age brackets (Breast feeding children take all the food values)</li> <li>• "Usually" means at least 3 times a week</li> </ul> <b>Ask the parent/guardian and then a child where applicable (13 -17 year. ) to double check</b>					
	a. <b>Energy foods:</b> (potatoes, banana, oils, posho, millet, rice, maize, bread, cassava) (Yes/No)					
	b. <b>Body building foods:</b> (beans, meat, soya, peas, milk, eggs, chicken, fish) (Yes/No)					
	c. <b>Protective and regulative foods:</b> (tomatoes, oranges, pawpaw, mangoes, pineapple) (Yes/No)					
<b>Option</b>	ALL of the options are selected as "No"	Two of the options are selected as "No"	One of the options are selected as "No"	All options are selected as "Yes"		
<b>Score</b>	4	2	1	0		
<b>CPA 2 TOTAL</b>						*
<b>CPA 3: HEALTH, WATER, SANITATION AND SHELTER</b>						
3.	<b>Does the following apply to (NAME)</b>					Yes/No/NA
	a. <b>Does not</b> sleep under an Insecticide Treated mosquito Net (ITN)					
	b. <b>Has not</b> received the required immunization at his/her age? (Applicable to 0-5 years ONLY and ask for the immunization card/book)					
	c. Has been too sick to go to school, play or do normal activities around the house for at least three consecutive days in the past 12 months					
	d. Has medically tested chronic illness (HIV+, sickle cells, epilepsy, cancer, etc)					
	e. Child has very low weight (wasted) or is too short (stunted) for his/her age (malnourished)					
<b>Option</b>	If more than 4 are Yes	If Three are YES	If Two Yes	If One Yes	If no any Yes	
<b>Score</b>	4	3	2	1	0	
<b>CPA 3 TOTAL</b>						*
<b>CPA 4: EDUCATION</b>						
4.	<b>What is [NAME's] school attendance status? (Children aged 5 – 17 years[Score 0 for 1-4 years])</b>					
<b>Option</b>	NOT enrolled in school	Misses school 3 or more times per week	Misses school twice per week	Misses school once per week	Attends school regularly	
<b>Score</b>	4	3	2	1	0	
<b>CPA 4 TOTAL</b>						*
<b>CPA 5: PSYCHOSOCIAL SUPPORT AND BASIC CARE</b>						
5.	<b>Does (NAME) own/use the following basic requirements?</b>					
	Owns at least two sets of clothing? (Exclude school uniform) (Yes/No)					
	Sleeps under a blanket or bed cover (Yes/No)					
	Owns at least a pair of shoes (Yes/No)					

						SCORES
	Has a birth registration certificate (Yes/No)					
<b>Option</b>	If All are <b>NO</b>	If Three are <b>NO</b> ,	If <b>TWO</b> are <b>NO</b>	If One <b>NO</b>	If All are <b>YES</b>	
<b>Score</b>	4	3	2	1	0	
<b>6.</b>	<b>In the last one MONTH, how often did (Name) feel sad, worried, withdrawn, or hopeless?</b>					
<b>Option</b>	More than five times	3-4 times	Two times	Once	Never	
<b>Score</b>	4	3	2	1	0	
<b>7.</b>	<b>Does [Name] has any form of disability?</b>					
<b>Option</b>	Yes, Child is not able to attend normal schools or play with others	Yes, but can be supported to walk, hear or see	Yes, Child is enrolled in a school for disabled	Yes, Child has slight disability but can play or attend school	None	
<b>Score</b>	4	3	2	1	0	
<b>CPA 5 TOTAL *</b>						
<b>CPA 6: CHILD PROTECTION AND LEGAL SUPPORT</b>						
<b>8.</b>	<b>Do the following apply to (NAME)</b>					
	a. Has ever been into marriage? (Yes/No)					
	b. Has had sex in past 12 months? [including being defiled] (Yes/No)					
	c. Has the ever been pregnant or made someone pregnant before (Yes/No)					
	d. Drunk alcohol or took drugs in the past 3 months (Yes/No)					
<b>Option</b>	If All are <b>YES</b>	If Three are <b>YES</b> ,	If <b>TWO</b> are <b>YES</b>	If One is <b>YES</b>	If All are <b>NO</b>	
<b>Score</b>	4	3	2	1	0	
<b>9.</b>	<b>Has (Name) experienced any form of the following child abuses in the last 30 days? Probe or observe for any types or signs of abuse.</b>					
	a. Denial of socialization with other children (Yes/No)					
	b. Denial of legal rights/access to justice (Yes/No)					
	c. Stigma & discrimination due to illness or disability (Yes/No)					
	d. Physical violence/abuse inflicting pain or injuries, <i>bruises, scratches, wounds</i> (Yes/No)					
	e. Emotional abuse (e.g. shouting at the child, public humiliation) (Yes/No)					
	f. Sexual abuse ( <i>forced sex, raped, defiled.</i> ) (Yes/No)					
	g. Denial of food (Yes/No)					
	h. Child is completely without the care of an adult and must fend for him/herself or lives in child headed household (Yes/No)					
<b>Option</b>	If at least Four are <b>YES</b>	If Three are <b>YES</b> ,	If <b>TWO</b> are <b>YES</b>	If One is <b>YES</b>	If All are <b>NO</b>	
<b>Score</b>	4	3	2	1	0	
<b>CPA 6 TOTAL *</b>						
<b>INDIVIDUAL TOTAL SCORE *</b>						
<b>GRAND TOTAL SCORE (HOUSEHOLD + INDIVIDUAL SCORE) *</b>						
<b>(USE THIS SCORE TO DETERMINE LEVEL OF VULNERABILITY)</b>						
<b>DETERMINE THE VULNERABILITY LEVEL</b>						

**INSTRUCTIONS:** After totaling all the scores under “GRAND TOTAL”, look at the table below and determine **WHERE** that child’s GRAND TOTAL score falls in the score range below.

LEVEL OF VULNERABILITY	GRAND TOTAL SCORE
Critically Vulnerable	<b>78 – 104 points</b>
Moderately Vulnerable	<b>38 – 77 points</b>
Slightly Vulnerable	<b>Less than 38 points</b>

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