

MICROFINANCE, HEALTH, AND EMPOWERMENT:
EVALUATING THE EFFECT OF AN INTEGRATED INTERVENTION ON CLIENT REVENUE
AND PROFIT IN BENIN

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ABSTRACT

Lara M.J. Lorenzetti: Microfinance, health, and empowerment:
Evaluating the effect of an integrated intervention on client revenue and profit in Benin
(Under the direction of Bruce Fried)

Greater emphasis is being placed on cross-sectoral development approaches, including the integration of microfinance and health services. Experts suggest that coordinating resources across sectors may produce synergistic effects. For instance, integrated microfinance and health (IMH) may generate greater health and financial outcomes for clients than either approach alone. However, evidence of IMH effectiveness is mixed. We conducted an evaluation to understand the value of combining microfinance and health programs.

We systematically analyzed peer-reviewed literature evaluating the effect of IMH interventions on client outcomes. We then analyzed data from a cluster-randomized controlled trial in Benin. We used a difference-in-differences approach to assess the effect of an integrated microfinance and health education intervention on client reported revenue and profit. Finally, we used confirmatory factor analysis to create a measure of women's empowerment. We interacted this measure with program effect to assess how program effect was influenced by level of empowerment.

Our systematic review included 35 articles. Evidence for IMH was moderate in quality. The strongest evidence was for integrated microfinance and health education programs, which reported increases in knowledge and some behaviors but not broader health outcomes. In Benin, participants in the integrated program reported on average USD 18 less in revenue than participants in the credit-only program ($p=0.05$). Effect on profit was negative but insignificant. The measure of empowerment had appropriate goodness of fit and was supported by qualitative empowerment interviews. Controlling for other variables, empowerment had a significant and

positive effect on revenue and profit. However, we found weak evidence that program effect differed by level of empowerment.

Although it is promising that IMH programs have demonstrated improvements in some health outcomes, there is no evidence of long-term change in health status. In Benin, integrated microfinance and health education had a significant negative effect on revenue. This analysis does not provide evidence of synergy from combining health and microfinance approaches. Despite positive effects of empowerment alone on revenue and profit, we found weak evidence that program effect was influenced by level of empowerment. Future research would be strengthened by longitudinal studies that include objective financial variables and robust measures of empowerment.

To my parents, Joseph and Lorraine Lorenzetti, for their unwavering and unconditional support.

Pour les femmes du Bénin qui travaillent pour à assurer une vie meilleure à leur famille.

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LIST OF ABBREVIATIONS

AIC	Akaike Information Criterion
ARI	acute respiratory infection
CFA	confirmatory factor analysis
CFA	<i>Communauté Financière d'Afrique</i> – West African franc
CHW	community health worker
CwE	Credit with Education
DID	difference-in-differences
ESP	Essential Services Package
FSW	female sex worker
GLM	generalized linear model
GRADE	Grades of Recommendation, Assessment, Development, and Evaluation
HMI	health micro-insurance
IMAGE	Intervention with Microfinance and AIDS for Gender Equity
IMH	integrated microfinance and health
IPV	intimate partner violence
ITN	insecticide-treated bed net
LGG	Learning Games for Girls
MFI	microfinance institution
OLS	ordinary least squares
OR	odds ratio
PADME	<i>Promotion et l'Appui au Développement de Micro-Entreprises</i>
RCT	randomized control trial
RMP	Rural Maintenance Program
SHG	self-help group
USD	U.S. dollar

CHAPTER 1. INTRODUCTION

Specific Aims

Microfinance institutions (MFIs) represent a growing private sector infrastructure that offers credit, savings, loans, insurance, and other financial services to households that do not have access to traditional banking services. Microfinance clients represent some of the poorest households in the world. As of 2013, 211.1 million people had accessed microfinance services, of which 54% were living in extreme poverty and roughly 75% were women (Reed, 2015). The effectiveness of microfinance has been long-debated, with some experts claiming that there is insufficient evidence to substantiate claims that access to microfinance meaningfully reduces poverty (Armendariz and Morduch, 2010; Roodman and Morduch, 2014). Nevertheless, access to microfinance products, particularly credit and savings, have demonstrated incremental positive effects in terms of reducing rates of poverty, food insecurity, and malnutrition (Hamad and Fernald, 2012; Leatherman *et al.*, 2012); increasing financial inclusion, business investment, and consumption-smoothing (Banerjee *et al.*, 2015); and improving investments in preventive health care and business in low- and middle-income countries (Dupas and Robinson, 2013a, 2013b).

The global development agenda has shifted to focus on cross-sectoral approaches that leverage and coordinate resources across multiple sectors (Buse and Hawkes, 2015), and microfinance has emerged as a viable platform upon which to integrate other social services. Specifically, MFIs have been targeted as promising providers of or connections to health services for clients and their families. Many MFIs now integrate health services into their existing credit programs, giving clients access to standard financial services as well as a selection of health

protection products (i.e. health education, health financing, or access to health services) (Metcalf and Leatherman, 2012). The literature suggests that combined microfinance and health interventions can positively impact health behaviors and outcomes (Rosenberg *et al.*, 2011; Metcalf and Leatherman, 2012). They may even offset the cost of health care and increase savings for households (Gertler *et al.*, 2009). Despite these benefits, global evidence for integrating microfinance and health services is somewhat mixed, with existing reviews providing inconclusive evidence of the direct effect of integrated programs on knowledge, behaviors, and broader health outcomes (Leatherman *et al.*, 2012; Arrivillaga and Salcedo, 2014; Kennedy *et al.*, 2014). Moreover, although integrated microfinance and health is touted as a successful cross-sectoral approach, there is a dearth of information exploring the effect of integrated programs on client financial outcomes in addition to their health outcomes. This limited information constrains our ability to draw firm conclusions of the value-add of bundling these services. Furthermore, the literature has not successfully explored the conditions or mechanisms through which clients achieve success within integrated programs.

The long-term goal of this analysis is to determine the effectiveness of integrating microfinance and health in improving outcomes for clients in low- and middle-income countries and to elucidate the role of empowerment in influencing the success of clients participating in this cross-sectoral approach. This research used data from a cluster randomized controlled trial (RCT) evaluating an integrated microfinance and health intervention in Benin. Clients were randomized into study arms to receive only group-based loans and financial training or an integrated package of health education plus group-based credit services. By examining participation in the health education intervention, we evaluated the effect of the program on clients' reported revenue and profit. We also assessed the role of empowerment in moderating this program effect. The central hypothesis was that clients in the integrated program would experience improved financial outcomes compared to their credit-only counterparts. Also, women who were more empowered would experience greater revenue and profit than those who

are less empowered. We tested these hypotheses by pursuing three specific aims.

Aim 1: To assess the evidence of integrated microfinance and health as an effective strategy to improving health and financial outcomes for clients. We conducted a systematic literature review, which included 35 articles covering 29 unique evaluations of integrated microfinance and health interventions in 17 countries. We rated the quality of evidence using the Grades of Recommendation, Assessment, Development, and Evaluation (GRADE) approach. We then provided a descriptive and summative analysis of studies, including their designs and key findings.

Aim 2: To estimate the effect of integrated microfinance and health education on clients' reported financial outcomes. We used data from a cluster RCT in Benin to conduct a difference-in-differences analysis evaluating the effect of the integrated microfinance and health education intervention on client reported revenue and profit.

Aim 3: To investigate the role of women's empowerment in improving financial outcomes for clients. We used confirmatory factor analysis to create a measure of women's empowerment based on data collected during the RCT. We used in-depth interviews with women in Benin to provide contextual validation for the quantitative measure. We then built on the approach in Aim 2 by creating an interaction term between the program effect and continuous and grouped levels of empowerment to determine how the program effect changed with an increase in empowerment.

This research provides new evidence of the effectiveness of bundling microfinance and health services. Chapter 3 provides an extensive review of the evidence of integrated microfinance and health (IMH) programs. Whereas existing research tends to focus on the effect of integrated microfinance and health on client *health* outcomes, the analysis in Chapter 4 focuses on the *financial* benefits, or lack thereof, to clients. Understanding the effects of both components, as well as the synergy of the two, will guide programmatic recommendations for continued or future integrated endeavors. Finally, in Chapter 5, we analyze how empowerment

interacts with program effect. Clarifying the role of empowerment will allow decision makers to more effectively target program recipients that may not be as successful in the program. These clients could be offered a tailored package of services to improve their ability to address health needs while also earning a profit.

Significance

Despite mixed evidence of its effectiveness, combining health products and services with microfinance programs has become a well-accepted health and economic development strategy. Existing evidence focuses on the health-related benefits of participating in an integrated microfinance and health program, such as health knowledge, attitudes, and some health behaviors. This research is significant because it analyzed the effect of the often-overlooked aspect of integrated programs: the financial outcomes for clients. Moreover, it evaluated how program effect changed based on level of empowerment, a measure of growing interest to program implementers, particularly in light of the post-2015 sustainable development agenda (United Nations General Assembly, 2015). This significance rests on three considerations:

First, the current evidence of the effectiveness of integrated microfinance and health (IMH) programs is one-sided. Evidence suggests that single sector approaches to health deliver inadequate solutions (Oliveira-Cruz *et al.*, 2003; Waage *et al.*, 2010). In response, researchers and implementers are keen to leverage resources across sectors to create programs that can achieve more sustainable and long-term change. However, despite the ubiquitous roll-out of IMH programs, thus far, the evidence mainly evaluates effectiveness in terms of health-related outcomes. Overall, studies report positive, though in many cases, modest effects of integrated programs on health knowledge and some behaviors (Leatherman *et al.*, 2012; Arrivillaga and Salcedo, 2014). Some experts, however, caution that microfinance programs saddled with other social services may not be effective in improving financial outcomes for clients (Kabeer, 2001). Therefore, in order to understand the value-add of integrating these two sectors, it is necessary

to evaluate the financial component for clients. This research is significant in that it specifically assessed client reported revenue and profit as a result of participating in an integrated microfinance and health education program.

Second, existing evidence on the effectiveness of IMH programs is limited by weak study design. Authors who have reviewed the effect of IMH programs on various health outcomes have found it challenging to compare the effectiveness of studies given the variety of designs, interventions, and characteristics of participants (Leatherman *et al.*, 2012; Arrivillaga and Salcedo, 2014; Kennedy *et al.*, 2014). Some studies used weak designs that did not include control groups, and many interventions had issues with self-selection. Kennedy *et al.* found the effects of these programs to be unclear and also noted that too few evaluations of programs in low- and middle-income countries are rigorous enough to be included in the peer-reviewed literature (Kennedy *et al.*, 2014). This study is significant in that it contributes to the evidence by assessing the effect of IMH on financial outcomes using data from a cluster RCT in Benin.

Third, there is limited information on how empowerment operates within an IMH program. Existing research is typically limited to understanding empowerment in a strictly microfinance framework. This study, however, measured how empowerment influences IMH program effect on client reported financial outcomes. This research is also significant in that it created a quantitative measure of empowerment that is specific to the study sample. Empowerment is a challenging area of study due to the lack of standardized measurement procedures (Malhotra *et al.*, 2002). Challenges notwithstanding, the third aim applied confirmatory factor analysis to create a measure of empowerment that can be used for statistical analysis in this dataset. We also used in-depth interviews with women in Benin to provide contextual understanding for the variables included in the empowerment measure.

Ultimately, this research used data from a rigorously designed study to evaluate critical gaps in the existing literature surrounding IMH programs. It provides important considerations for ongoing and future integrated interventions in low- and middle-income contexts.

CHAPTER 2. APPROACH

Aim 1: Systematic Review

Search Strategy

From June through September 2015, we conducted a systematic literature search in databases that captured peer-reviewed articles at the cross section of health, economics, and empowerment and social inclusion. The databases selected were PubMed, Scopus, Embase (no overlaps with MEDLINE), EconLit, and Global Health. We also conducted a hand search of references. Our search strategy was adjusted accordingly for each database. We searched for a combination of microfinance and health terms, such as: (microfinance* OR “micro-finance” OR microcredit* OR “micro-credit” OR microloan* OR “micro-loan” OR microlending OR microinsurance OR “micro-insurance” OR “village bank” OR “savings group” OR “self help group”) AND (malaria OR HIV/AIDS OR HIV OR AIDS OR “acquired immunodeficiency syndrome” OR TB OR tuberculosis OR health OR maternal health OR child health OR breastfeeding OR “breast feeding” OR “domestic violence” OR “domestic abuse” OR “intimate partner violence”).

Inclusion & Exclusion Criteria

Inclusion criteria were:

- English language peer-reviewed journal articles
- Studies that assessed the effect of an *integrated* microfinance and health approach. We define an integrated approach as one that intentionally combines microfinance or financial inclusion services with a health component for clients. An integrated approach may take many forms, as outlined in Chapter 3, Table 1.

- Studies with clearly defined research objectives producing original research
- No date restrictions

Exclusion criteria were:

- Evaluated the impact of microfinance *only* interventions on client health outcomes
- Assessed feasibility, acceptability, or barriers to uptake without also examining effects of an integrated program
- Studied programs integrating health activities with cash transfer programs or vocational training *only*. Though these interventions also foster financial inclusion, they were considered outside the scope of this review.
- Employed only qualitative methods, as these have limited ability to evaluate program impact
- Lacked methodological rigor (i.e. descriptive statistics only)

The search generated 1502 articles, inclusive of duplicates across databases (Figure 2.1). After de-duplication, we conducted an initial title and abstract search on 964 articles. We excluded 855 articles at this stage, yielding 109 studies for full text review. Two reviewers voted on each article, with conflicts being resolved by a third reviewer. In total, 35 articles covering 29 unique evaluations met all inclusion criteria and are explored in this review.

Data Abstraction

We abstracted the following data from each article: study aim, research intervention, study design, subjects, sample size, intervention and control conditions, outcomes of interest, key findings, and main limitations. Each article was assigned a study design type. Finally, each article was broken down by health components.

Quality Assessment

We conducted a quality assessment of each article based on the Grades of Recommendation, Assessment, Development, and Evaluation (GRADE) approach, adopted by the Cochrane Collaboration to evaluate the quality of evidence in systematic reviews. GRADE identifies four quality levels (high, moderate, low, very low) based on underlying study methodology. Randomized controlled trials (RCTs) are graded as high quality. Quasi-experimental studies without important limitations can provide high quality evidence, but were immediately downgraded to moderate due to lack of a randomized control group. Observational studies were characterized as low. All studies could be downgraded or upgraded based on the presence of one or more factors as detailed in the GRADE Handbook (Schunemann *et al.*, 2013).

Analysis

We were unable to conduct a meta-analysis given the diversity of study populations, intervention conditions, and outcomes evaluated. Instead, we presented a descriptive summary of studies, including their designs and findings. In order to evaluate and provide recommendations based on intervention type, we organized the results section by each study's main health component. The health component categories were: health education and promotion; health financing and health micro-insurance (HMI); linkages to health providers (direct or indirect); access to health products; and multiple components.

To categorize studies, we first identified the specific health components of each intervention. We then determined the primary health component. Sorting was straightforward for studies with one health component. However, many studies examined interventions with multiple health components (i.e. health education as well as linkages to health services). If a study addressed two health components, reviewers jointly determined the *primary* health component and then sorted the article accordingly. Interventions with three or more health

components of equal importance were grouped and described together under “Multiple Components”.

Aims 2 & 3: Difference-in-Differences

Conceptual Framework

The conceptual model was developed specifically for this research to demonstrate the proximal and distal outcomes of the integrated microfinance and health education intervention. As shown in Figure 2.2, this working framework suggests that the intervention effects key outcomes through knowledge, which functions as a mediating variable. Several theories point to behavioral changes as the end goal for education initiatives. Knowledge may be the psychological process through which the health intervention influences a change in behaviors, which ultimately yields improvements in health and household economic outcomes. Prior research of this data confirms that the health education intervention is associated with an increase in health knowledge, specifically on the causes of preventable illnesses and risk-reduction strategies (Freedom from Hunger, 2007). This model also suggests that participation in the intervention may positively influence client financial outcomes, including client reported revenue and profit. Clients who are in better health may have more energy, time, and resources to invest in their business ventures, resulting in increased revenue and profits. Similarly, these clients may find it easier to make loan repayments.

This conceptual model points to empowerment as another key variable that influences the success of the health education intervention. Empowerment is often theorized to be a driving force in the success of structural interventions, particularly those focusing on women or disadvantaged groups. The distinction here is that empowerment may be acting as a moderating variable, which changes the strength of the relationship between health education and key outcomes. Empowerment is a complex construct that has been defined in different ways. However, this research used Kabeer’s definition, which is expressed as gaining the ability to

make decisions for one's life choices when previously this ability was not available to them (Kabeer, 2001). To guide conceptualization of empowerment, we applied Anju Malhotra's seminal report on women's empowerment in international development, which points to six main dimensions that inform this construct: economic, socio-cultural, familial/interpersonal, legal, political, and psychological (Malhotra *et al.*, 2002). Factors associated with each of these dimensions, including decision-making autonomy, self-efficacy, and access to social networks, contribute to an overarching understanding of empowerment in different contexts (Malhotra *et al.*, 2002). Empowerment, or aspects of the construct, is indicated as a factor affecting health outcomes in a number of theories. For example, the health belief model considers self-efficacy as a notable factor in promoting behavior change (Janz and Becker, 1984). As previously mentioned, self-efficacy is a dimension of empowerment, indicating that empowerment as a broader concept might indeed play an important role in achieving improvements in health or financial outcomes in the proposed framework. Furthermore, the Theory of Gender and Power points to various individual and community level factors related to women's empowerment that create imbalances in power between men and women. Imbalances can generate exposures that negatively impact women's health, and minimizing gaps in the power dynamic could alternatively improve health outcomes (Wingood and DiClemente, 2000). Here, we consider an increase in empowerment to represent a minimization of this power gap.

This conceptual model posits that because women in this study are already MFI clients, they likely have some baseline level of empowerment. However, some women will have higher baseline levels of empowerment than others (i.e. a woman who seeks a loan of her own volition may be more empowered than a woman who seeks a loan because her mother-in-law tells her to do so). Because the health education intervention increases knowledge, it may be reasonable to expect an impact on health or financial outcomes even when empowerment is minimal. However, we hypothesized that higher empowerment would moderate this relationship by increasing the strength of the association between health education and outcomes of interest.

Setting

Benin is a francophone West African country with a population of 10.8 million, of which approximately 47% live below the international poverty line (USD 1.25/day) (UNICEF, 2015; World Bank, 2015). Formal banking options are unavailable to much of the population, presenting microfinance institutions (MFIs) with an important opportunity to close this gap for underserved households. In 2014, it was estimated that less than 17% of the adult population in Benin, ages 15 and older, had a formal bank account (Demirgüç-Kunt *et al.*, 2015).

Promotion et l'Appui au Développement de Micro-Entreprises (PADME) is one of the largest MFIs in Benin with a gross lending portfolio of CFA 26,089,692,000 (USD 43,885,800) and more than 32,000 active clients (PADME Benin, 2015). With the support of Freedom from Hunger, a non-profit organization based in Davis, California, PADME created a new Credit with Education (CwE) product offering microfinance along with basic health education for clients.

Credit with Education (CwE) Program

The CwE program provided group-based savings and loans combined with a 10-week health education program to women-only or mixed-gender groups in specified communities within PADME's network. Groups were comprised of at least four members of different households; individuals had to be at least 16 years of age and capable of conducting a business activity. Within each group, individuals applied for loans appropriate to their needs. Individual loans did not exceed the equivalent of USD 50 for the first loan and had to be repaid within 16 weeks. In addition to basic business training, CwE groups received 10 weeks of health education provided by a trained loan officer on a variety of health topics, including: signs and symptoms of child illness, HIV/AIDS, malaria, and improving self-confidence in decision-making. The control group consisted of credit groups who received the credit and business training services but did not receive health education.

Data Source

This research used a dataset collected by Freedom from Hunger as part of cluster RCT to assess aspects of the integrated CwE intervention among PADME clients in Benin (Gray and Ekoue-Kouvahey, 2010). Randomization occurred at the village level with all groups assigned to one of four study arms: 1) women only groups receiving group-based microfinance with no access to health education; 2) mixed-gender groups receiving group-based microfinance with no access to health education; 3) women only groups receiving credit plus health education; and 4) mixed-gender groups receiving credit plus health education (Figure 2.3) (Gray and Ekoue-Kouvahey, 2010). Data were collected through household surveys at baseline in 2007 and endline in 2009. Surveys at both time points were similar, with some questions added or edited at endline. Ultimately, each included 12 modules covering the following topic areas: household listing; household goods and characteristics; malaria knowledge; mosquito net usage; pregnancy and antenatal care; childhood illness; food security; accountability and social networks; household decision making; credit and finances; business ventures; and HIV/AIDS (Freedom from Hunger, 2007).

Sample

In total, 116 PADME communities in Benin's plateau region were randomized to one of the four study groups. At baseline, 43 villages were sampled; however, this was expanded to 73 additional communities at follow-up, totaling 116 clusters. See Figure 2.3 for details on clusters per study group. The baseline sample consisted of only PADME clients, totaling 1099 clients in the 43 communities (average of 30 per cluster) randomly sampled to participate in the survey. Ten percent of baseline respondents were men and were subsequently excluded from this analysis. Similarly, at endline, approximately 30 respondents were sampled in each of the 116 communities; however, this new, larger sample of respondents also included non-clients. All respondents were women, and PADME clients represented approximately 30% of endline

respondents. For the purposes of this analysis, we utilized the women-only baseline sample of 991 respondents in 43 clusters. In order to evaluate the effect of the program on PADME clients, we excluded all non-clients at follow-up, which reduced the sample size to 1093 respondents. Certain villages at follow-up did not have any PADME respondents; therefore, the number of clusters in the second time period decreased slightly from 116 to 109. The four study arms were collapsed into two groups: those receiving CwE and those receiving credit-only, regardless of the composition of group members. As shown in Figure 2.3, the groups used in this analysis were balanced in terms of sample size and clusters.

Key variables and measures

The key dependent variables for Aims 2 and 3 were clients' reported revenue and profit within the last seven days. These were continuous continuous variable reported in local currency (CFA); however, for the purposes of this analysis, we converted CFA to USD using an average annual exchange rate of CFA 474 to USD 1 between 2007 and 2009. There were missing values for both revenue and profit stemming from a survey skip pattern. Specifically, respondents were first asked if they were engaged in an income generating activity. If they responded 'No', they skipped over the questions on profit and revenue, and their response was marked as missing. Since they were not engaged in any income generating activity, missing responses were recoded as 0 for both revenue and profit for the purposes of this analysis.

For independent variables, we created indicator variables representing whether the household was a CwE participant in the follow-up period in order to compare trends in CwE and credit-only villages.

The third aim used the same dependent and independent variables but also incorporated a measure of empowerment. Empowerment was measured at the individual level, incorporating dimensions of empowerment as suggested by previous studies (Malhotra and Schuler, 2005; Do and Kurimoto, 2012). We used second order confirmatory factor analysis (CFA) to assess the

factor structure of observed and latent variables measuring the empowerment construct. To do so, we first identified items from the household survey and grouped them into theorized dimensions of empowerment: economic, socio-cultural, inter-personal, legal, political, and psychological. We then evaluated if items in each domain were correlated, thereby creating sub-dimensions. Through an iterative process, items were evaluated as latent variables or as directly observed variables until an appropriate model was identified. Our model incorporated economic, socio-cultural, and inter-personal dimensions of empowerment.

The economic dimension was measured by one item asking about *women's contribution to household revenue* in the past year. Response options were (0) no revenue; (1) a small portion; (2) less than half; (3) half; (4) the majority; and (5) all. The socio-cultural dimension was measured by two latent variables: *freedom of movement* and *community leadership*. Freedom of movement was a four-item variable asking if women were able to go to the following places unaccompanied: the market, the health center, a friend's house, and a place of worship. Response options were (0) cannot go; (1) can go but not alone; (2) can go alone. The leadership latent variable was measured by three items: number of community groups in which the woman participates (count variable); if the woman had spoken at a community meeting in the past 12 months ([0] no, [1] yes); and if she has been a candidate or elected to a community post in the past 12 months ([0] no, [1] yes). The inter-personal dimension was measured by a 4-item *decision-making* variable. Respondents were asked about household decision-making power. Specifically, who decided on issues of: sending the children to school; community groups in which children are allowed to participate; goods the family will buy or sell; and working outside the home or not. Response options were (0) husband only; (1) joint decision; and (2) the respondent. We were unable to explore the legal dimension as the survey did not include items covering this topic. During the CFA process, we determined that items pertaining to political and psychological empowerment did not fit in our model of empowerment.

Our overall empowerment measure performed well in terms of goodness of fit, with an RMSEA of 0.049, CLI of 0.987, and TLI of 0.983. The factor estimates ranged in strength, though all were statistically significant.

Qualitative validation of empowerment measure

In June 2015, we conducted 15 in-depth interviews with women across four diverse geographic regions in Benin: Capital, Plateau (same region as survey data), Collines, and Alibori. Participants in each locale were purposively selected from three age ranges: 18-34, 35-49, and over 50 years. The goal of these interviews was to contextualize empowerment and the status of women in Benin. The questionnaire was modeled after various tools assessing women's status and incorporated questions touching on the six distinct dimensions of empowerment as identified by Malhotra and Schuler. The interview guide was translated into French and back translated into English to ensure appropriate interpretation of questions and themes. Interviews were conducted in French and lasted between 45 and 60 minutes. Although these interviews were conducted after the cluster RCT was already complete and therefore could not directly inform the empowerment data collected, interviews provided important contextual information about the empowerment variable that was constructed for this analysis. Ethical approval for qualitative interviews was granted by the institutional review board of the University of North Carolina at Chapel Hill (15-1644).

Analytic Approach

For Aim 2, we conducted a difference-in-differences (DID) approach in order to assess the effect of the CwE program on clients' reported revenue and profit. This approach measures the change in means between credit-only and CwE groups, while controlling for unobservable differences in group characteristics at baseline as well as changes in dependent variables over time. DID is subject to the assumption that trends in key outcomes would be the same in

intervention and control groups in the absence of the program. The randomization of villages at baseline helps balance groups and reduce the likelihood that trends in outcomes would differ between the two groups. To the best of our knowledge, there were no concurrent programs or events occurring in the region during the study period that may have affected the outcomes of interest differently by group.

We first ran the DID as an ordinary least squares (OLS) model. However, given the right-skew distribution of the dependent variables, we also included an analysis using a generalized linear model (GLM) with a log link and gamma distribution. This model treats the dependent variables as logged transformations and does not drop out the large number of zeros from the analysis. The gamma distribution was considered appropriate given the continuous, right-skew dependent variables with values 0 and greater. All analyses included clustered standard errors at the village level.

For Aim 3, we leveraged the base model used in Aim 2 and conducted several additional analyses in order to examine the role of women's empowerment in the the CwE program. We did so by first creating an empowerment measure using CFA described above. We then calculated a factor score for each individual in the dataset. We created a second model incorporating a continuous measure of empowerment as a control variable in the base model in order to examine the effect, if any, on revenue and profit. We also created models of the component latent and observed variables of empowerment (i.e. decision-making, freedom of movement, community leadership, and household contribution).

Interaction terms between empowerment and the program effect variable were created to determine if program effect varied at different levels of empowerment for the entire sample. We first examined program effect with empowerment as a continuous variable and then as terciles of empowerment: low, medium (or average), and high. We examined the literature and determined that separating into three groups provides reasonable gradation of empowerment levels, although we did not find specific empowerment cutoff points. In using the full sample,

there were some concerns of endogeneity given that empowerment is conceptualized to be influential at different levels and along various pathways in a complex intervention such as IMH. We therefore wanted to isolate empowerment at baseline and understand how being more or less empowered at the start of the intervention affects revenue and profit over time. Given the cross-sectional nature of the data, we could not explore individual baseline empowerment. Instead, we dropped all clusters that did not have respondents at both time points and examined average empowerment at the village level. We identified a mean empowerment score per village and applied terciles to the baseline-only empowerment measure. We then conducted the abovementioned analyses with continuous and tercile empowerment interacted with the program effect in the reduced sample. Finally, we calculated average marginal effects to facilitate interpretation of results; however, we did not calculate marginal effects for interaction terms but instead provide predictive values to explain the relationship. Graphs of predicted mean values and marginal effects are provided in Chapter 5.

Figures and Tables

Figure 2.1 PRISMA Diagram

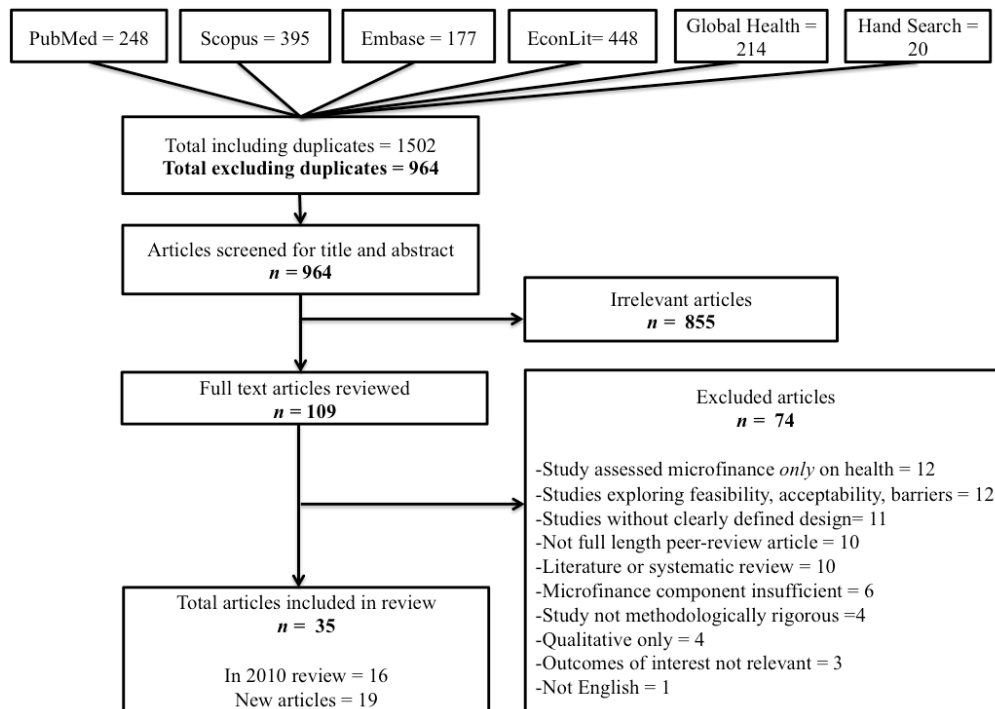


Figure 2.2 Conceptual Model

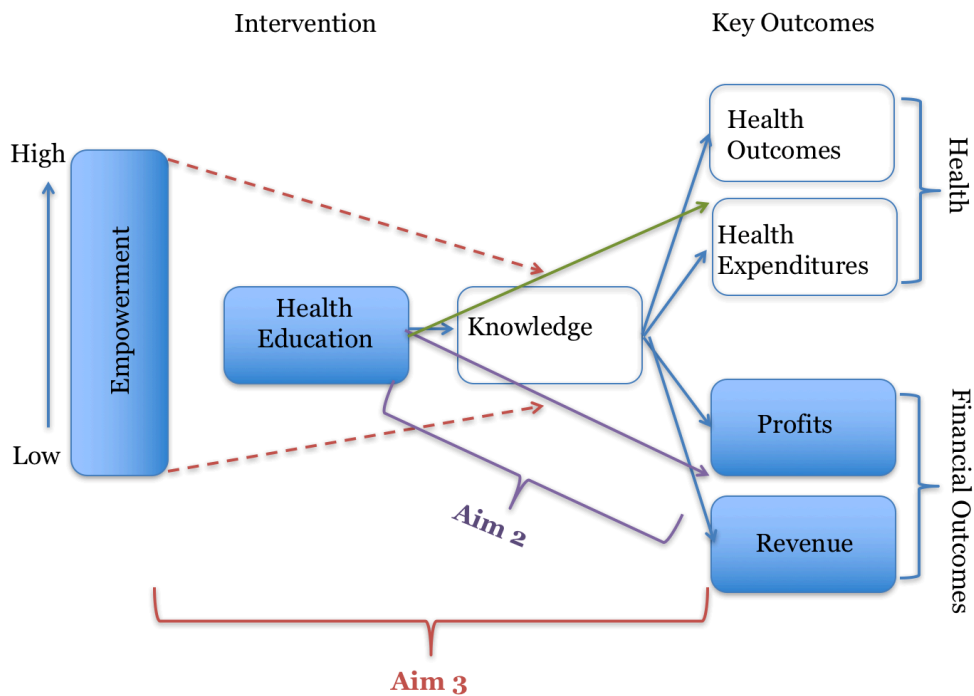
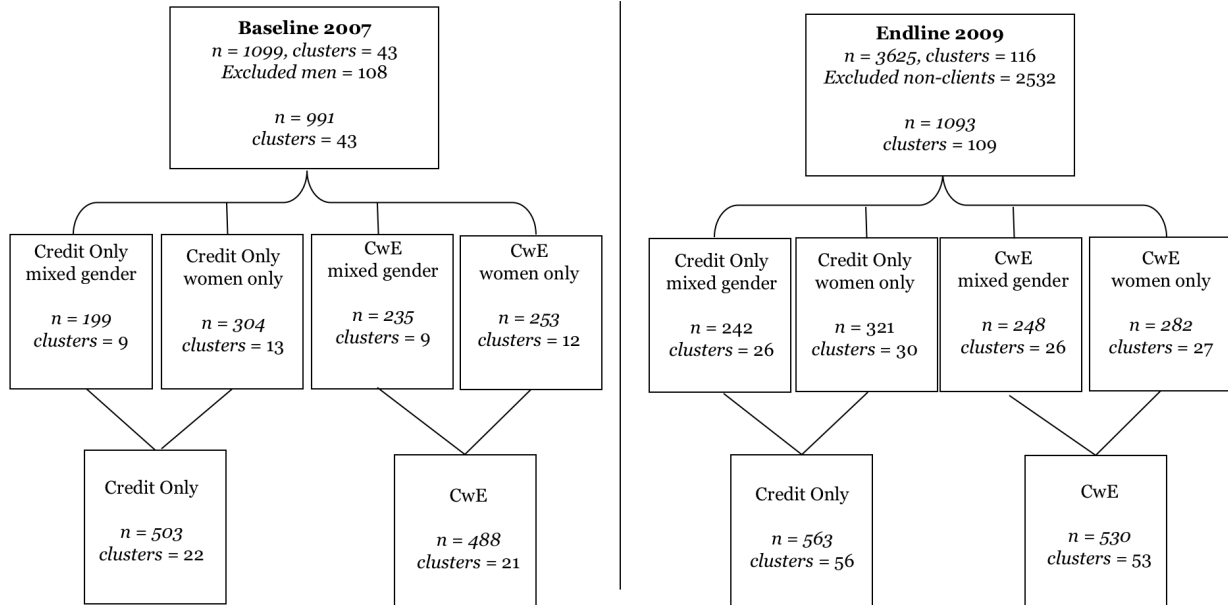


Figure 2.3 Study Groups



CHAPTER 3. EVALUATING THE EFFECT OF INTEGRATED MICROFINANCE AND HEALTH INTERVENTIONS: AN UPDATED REVIEW OF THE EVIDENCE

Overview

Background: Solutions delivered within firm sectoral boundaries are inadequate in achieving income security and better health for poor populations. Integrated microfinance and health interventions leverage networks of women to promote financial inclusion, build livelihoods, and safeguard against high cost illnesses. Our understanding of the effect of integrated interventions has been limited by variability in intervention, outcome, design, and methodological rigor. This systematic review synthesizes the literature through 2015 to understand the effect of integrated microfinance and health programs.

Methods: We searched PubMed, Scopus, Embase, EconLit, and Global Health databases and sourced bibliographies, identifying 964 articles exclusive of duplicates. Title, abstract, and full text review yielded 35 articles. Articles evaluated the effect of intentionally integrated microfinance and health programs on client outcomes. We rated the quality of evidence for each article.

Results: Most interventions combined microfinance with health education, which demonstrated positive effects on health knowledge and behaviors, though not health status. Among programs that integrated microfinance with other health components (i.e. health micro-insurance, linkages to health providers, and access to health products), results were generally positive but mixed due to the smaller number and quality of studies. Interventions combining multiple health components in a given study demonstrated positive effects, though it was unclear which component was driving the effect. Most articles (57%) were moderate in quality.

Discussion: Integrated microfinance and health education programs were effective, though longer intervention periods are necessary to measure more complex pathways to health status. The effect of microfinance combined with other health components was less clear. Stronger randomized research designs with multiple study arms are required to improve evidence and disentangle the effects of multiple component microfinance and health interventions. Few studies attempted to understand the changes in economic outcomes, limiting our understanding of the relationship between health and income effects.

Introduction

Imperative for intersectoral approaches

Despite progress towards the Millennium Development Goals from 2000-2015, achievements were uneven (United Nations, 2015). One billion people continue to live in extreme poverty. Furthermore, national performance measures often mask ongoing disparities within countries, such as unequal access of women, the rural poor, and indigenous groups to both health care services and income-generating activities (World Health Organization and UNICEF, 2013). The new Sustainable Development Goals seek in part to address the twin challenges of eliminating poverty and ensuring healthy lives (United Nations General Assembly, 2015). However, strategies for achieving these goals are not well defined. Solutions that are organized and delivered within firm sectoral boundaries continue to be inadequate (Buse and Hawkes, 2015). They seem unable to reliably resolve the intertwined issues of access to care, health and nutritional status, health systems capacity, and poverty. The poor, in particular, need access to an integrated set of financial and health services so they might have some modicum of income security and better health.

Microfinance, a broadly defined set of financial services, is a well-established platform that aspires to help poor families, especially women, to increase their role in economic activities, build livelihoods, reduce vulnerability to financial shocks, and smooth consumption (i.e. balance

spending and savings over time) (Gertler *et al.*, 2009). Microfinance is delivered in a number of ways, including through microfinance institutions (MFIs), self-help groups (SHGs), cooperatives, village banks, and savings groups. In 2011, MFIs alone reached 195 million clients, of which 124.2 million were among the poorest at the time of their first loan (Maes and Reed, 2012). SHGs, MFIs, and savings groups, by design, provide an opportunity for greater financial inclusion, participation, and voice of women in their local affairs. Simultaneously, the vast network of women's groups organized for microfinance can be leveraged to work within local health contexts to improve health knowledge, behavior, and access to health services (Metcalf and Leatherman, 2012). Through participation in these groups and the social capital that is realized, women are able to educate, influence practices and behaviors of peers, and more reliably access and benefit from services offered as a condition of their group membership.

MFIs, SHGs, and savings groups can expand their role to include the delivery of effective health related programs. For example, financial groups might: offer education to stimulate demand for essential health interventions that support women in making better health and nutrition decisions; promote savings and other financing options to pay for health services; and/or improve access to affordable public and private health providers as well as basic health-related products. Evidence is mounting that utilizing microfinance groups and SHGs is a reliable, low-cost, and sustainable way to reach poor mothers and children with vital health information, products, and services (Leatherman *et al.*, 2013).

Studies have demonstrated benefits of combining microfinance and health in a variety of areas, including neonatal and maternal mortality, infant and young child feeding, childhood diarrhea, sexually transmitted infections, and gender-based violence (Leatherman *et al.*, 2012). Health interventions delivered through women's groups have reduced neonatal mortality, including socio-economic inequalities in neonatal mortality, encourage early initiation of breastfeeding, improve care-seeking behavior for illness, and address maternal mental health issues (Houweling *et al.*, 2013; Prost *et al.*, 2013). Moreover, health-related education and

services delivered by MFIs and savings groups have had spillover effects on awareness and change in knowledge, attitude, and behaviors in non-participating households in the wider community (Smith, 2002; Tripathy *et al.*, 2010). These findings are consistent with other work that strongly suggests positive value from integrated health and financial services, particularly when deployed via participatory methods with women's groups (Manandhar *et al.*, 2004; Fottrell E *et al.*, 2013; Lewycka *et al.*, 2013). Although program packages vary across regions and partners, integrated health and financial service interventions typically include at least one health component found in Table 3.1.

Measuring Impact

Leatherman *et al.* (2012) conducted a systematic review that analyzed and reported on the effects of a range of integrated microfinance and health studies that were conducted through 2010. For example, it explored various health components described in Table 3.1 and their effects on client knowledge, health behavior, use of health services, health outcomes, and health systems capacity. In general, the 2012 review found support for integrated approaches. However, studies varied considerably by intervention, outcome, design, and methodological rigor, making it challenging to draw recommendations for best practice models of integration. Other reviews of integrated microfinance and HIV-related programs had similar findings (Arrivillaga and Salcedo, 2014; Kennedy *et al.*, 2014). Fortunately, new evidence is available to expand our understanding of these integrated approaches. We augment the previous review by exploring five additional years of evidence through 2015. This review improves upon the previous by going beyond formal MFIs to include development organizations or any formally defined groups working for financial inclusion through direct provision or brokering access to credit, savings, and loans. We also systematically graded the quality of the existing evidence. This review seeks to provide actionable recommendations to program implementers and

researchers surrounding the design and evaluation of integrated microfinance and health programs.

Methods

Search Strategy

From June through September 2015, we conducted a systematic search of peer-reviewed literature in five databases: PubMed, Scopus, Embase (no overlaps with MEDLINE), EconLit, and Global Health. We also conducted a hand search of references. These databases were selected to capture articles at the cross section of health and economic empowerment and inclusion. Our search strategy was adjusted accordingly for each database. Generally, we searched for a combination of microfinance and health terms; for example: (microfinance* OR “micro-finance” OR microcredit* OR “micro-credit” OR microloan* OR “micro-loan” OR microlending OR microinsurance OR “micro-insurance” OR “village bank” OR “savings group” OR “self help group”) AND (malaria OR HIV/AIDS OR HIV OR AIDS OR “acquired immunodeficiency syndrome” OR TB OR tuberculosis OR health OR maternal health OR child health OR breastfeeding OR “breast feeding” OR “domestic violence” OR “domestic abuse” OR “intimate partner violence”).

Inclusion Criteria

The search was not restricted by date; however, articles in this review met the following inclusion criteria:

- English language peer-reviewed journal articles
- Studies that assessed the effect of an *integrated* microfinance and health approach. We define an integrated approach as one that intentionally combines microfinance or financial inclusion services with a health component for clients. An integrated approach may take many forms, as outlined in Table 3.1.

- Studies with clearly defined research objectives producing original research

Studies were excluded if they:

- Evaluated the effect of microfinance *only* interventions on client health outcomes
- Assessed feasibility, acceptability, or barriers to uptake without also examining effects of an integrated program
- Studied programs integrating health activities with cash transfer programs or vocational training *only*. Though these interventions also foster financial inclusion, they were considered outside the scope of this review.
- Employed only qualitative methods, as these have limited ability to evaluate program impact
- Lacked methodological rigor (i.e. descriptive statistics only)

As shown in Figure 3.1, the search generated 1502 articles, inclusive of duplicates across databases. After de-duplication, we conducted an initial title and abstract search on 964 articles. We excluded 855 articles at this stage, yielding 109 studies for full text review. Two reviewers voted on each article, with conflicts being resolved by a third reviewer. In all, 35 articles covering 29 unique evaluations met all inclusion criteria and are explored in this review, roughly doubling the relevant articles from Leatherman *et al.* (2012), which explored 17 articles in the previous review.

Data Abstraction

We abstracted the following data from each article: study aim, research intervention, study design, subjects, sample size, intervention and control conditions, outcomes of interest, key findings, and main limitations (Table 3.2 & Annex A). Each article was assigned a study design type. Finally, each article was broken down by health components (Table 3.3).

Quality Assessment

We conducted a quality assessment of each article based on the Grades of Recommendation, Assessment, Development, and Evaluation (GRADE) approach, adopted by the Cochrane Collaboration to evaluate the quality of evidence in systematic reviews. GRADE identifies four quality levels (high, moderate, low, very low) based on underlying study methodology. Randomized control trials (RCTs) are graded as high quality. Quasi-experimental studies without important limitations can provide high quality evidence, but are immediately downgraded to moderate due to lack of a randomized control group. Observational studies are characterized as low. All studies can be downgraded or upgraded based on the presence of one or more factors as detailed in the GRADE Handbook (Schunemann *et al.*, 2013).

Analysis

The integrated programs in this review represent a diversity of study populations, intervention conditions, and outcomes. As such, we were unable to conduct a meta-analysis. Instead, we present a descriptive summary of studies, including their designs and findings. In order to evaluate and provide recommendations based on intervention type, we organized the results section by each study's main health component. As described in Table 3.1, the health component categories are: health education and promotion; health financing and health micro-insurance (HMI); linkages to health providers (direct or indirect); access to health products; and multiple components.

To categorize studies, we first identified the specific health components of each intervention (see Table 3.3). We then determined the primary health component. Sorting was straightforward for studies with one health component. However, many studies examined interventions with multiple health components (i.e. health education as well as linkages to health services). If a study addressed two health components, reviewers jointly determined the *primary* health component and then sorted the article accordingly. Interventions with three or

more health components of equal importance were grouped and described together under “Multiple Components”.

Results

Study Selection and Assessment of Rigor

Our search generated 35 articles representing 29 unique interventions. Three interventions were assessed by more than one article. Specifically, an intervention providing microfinance loans to Ugandan midwives was evaluated at two times points (Agha *et al.*, 2004; Seiber and Robinson, 2007), and two articles assessed distinct outcomes for a microfinance and nutrition intervention in Ghana (Marquis and Colecraft, 2014; Marquis *et al.*, 2015a). Five articles evaluated discrete outcomes or sub-groups for the Intervention with Microfinance for AIDS and Gender Equity (IMAGE) study in South Africa (Pronyk *et al.*, 2006; Kim *et al.*, 2007; Pronyk *et al.*, 2008a, 2008b; Kim *et al.*, 2009).

In all, integrated interventions were implemented in 17 countries¹ across Latin America, sub-Saharan Africa, South Asia, and the Western Pacific. At the time of each study, most countries were designated as middle-income economies by the World Bank, with the exception of Bangladesh², Ethiopia, Kenya, Malawi, and Uganda (low-income). Ghana transitioned from low-income to lower middle income over the course of three studies reviewed.

Of 35 articles, 15 (42.9%) were RCTs, typically randomized at the community or cluster level; 15 (42.9%) were quasi-experimental studies that included a non-randomized control group; and 5 (14.2%) were non-experimental studies that lacked a control group. We assessed the specific limitations and their implications of each study and assigned a GRADE score for each. This resulted in 8 studies (22.9%) scored as high quality evidence, 20 (57.1%) as moderate, 6 (17.1%) as low, and 1 (2.9%) as very low quality.

¹ Bangladesh, Colombia, Dominican Republic, Ecuador, Ethiopia, Ghana, Honduras, India, Kenya, Malawi, Mongolia, Nigeria, Pakistan, Peru, South Africa, Thailand, and Uganda.

² Bangladesh and Kenya graduated to lower middle income economies after studies were conducted.

Roughly half of RCTs were downgraded for methodological issues. For example, the 5 IMAGE articles were downgraded for lack of precision, resulting from a small number of clusters ($n=8$) leading to wide confidence intervals (Pronyk *et al.*, 2006; Kim *et al.*, 2007; Pronyk *et al.*, 2008a, 2008b; Kim *et al.*, 2009). Another RCT was downgraded because the intervention was discontinued before follow-up due to protest among participants (Banerjee *et al.*, 2014). Other RCTs were downgraded for a combination of small sample size and risk of bias in measures used. Quasi-experimental studies received initial ratings of moderate due to the lack of a randomized control group. Indeed, selection bias was a notable limitation across almost all studies. Two quasi-experimental studies were downgraded to low quality: one did not have baseline data for the control group (Amin *et al.*, 2001), and another used only post-test data to compare between groups (Freeman *et al.*, 2012). Low quality studies typically had no control group. One study was downgraded to very low for a number of issues, including lack of a control group and analysis that failed to control for confounding variables (Sherer *et al.*, 2004). Quality scores can be found in Annex A.

General Limitations Within Studies

All studies had limitations, even those that were not downgraded. Most notably, selection bias was an issue for most studies. Clients tend to self-select into microfinance programs, signifying that individuals in these studies may be fundamentally different from those who do not participate in microfinance. Self-selection limits the ability to generalize to broader parts of the population, which may hinder program efforts to scale-up or expand to populations of interest. In this review, only Desai and Tarozzi (2010) rolled out microfinance to new clients rather than operating within pre-defined groups of microfinance clients. Relatedly, non-random placement of MFIs means that research is often shaped around existing MFI catchment areas, which further limits generalizability to a broader population.

Other important limitations include: lack of randomized intervention groups (15 articles); lack of control group (5 articles); small number of clusters or small sample size (11 articles); potential spillover or contamination of intervention (8 articles); or short intervention period (5 articles). Many studies also cited recall, self-report, or social desirability bias in various outcome measures. Finally, many studies included multi-component health interventions and were unable to isolate which aspects were driving program effect. Refer to Annex A for a detailed assessment of individual study limitations.

Findings

A. Health education and promotion

Twenty articles, representing 57% of all studies, delivered health education or promotion activities as the singular (16) or primary (4) health component. The majority of these included health education sessions provided by trained microcredit officers or health providers at regularly scheduled microcredit meetings. Content of educational sessions was dependent on the study's outcome of interest. For example, if the study intended to increase uptake and usage of insecticide treated bed nets (ITNs), education sessions might have focused on causes, prevention, and symptoms of malaria. A summary of integrated health education interventions is presented below.

HIV/AIDS

Five studies evaluated aspects of the IMAGE study in South Africa, a structural intervention combining microfinance activities with HIV and gender education (Pronyk *et al.*, 2006; Kim *et al.*, 2007; Pronyk *et al.*, 2008a, 2008b; Kim *et al.*, 2009). This cluster-randomized trial was implemented over 2 years and included 8 pair-matched villages that were randomly assigned to the intervention. Kim *et al.* studied the effect of participation on women's empowerment and intimate partner violence (IPV) in 2007 and 2009. In the intervention

villages, participants received education and loans and were pair-matched by age and poverty to controls that received neither. Kim *et al.* (2007) found the risk of past-year IPV was reduced by more than half ($RR=0.45$; 95% $CI=0.23, 0.91$) and there were improvements across all 9 indicators of women's empowerment. The Kim *et al.* (2009) follow-up study added participants as a comparison group that received only microfinance services but not education. The intervention group had consistent improvements across all 24 measurements of empowerment, IPV, and HIV risk behavior, with several measures being statistically different from the microfinance only or control groups. The microfinance only and intervention groups each showed economic improvements relative to the control group; however, change in economic indicators was not statistically different between the microfinance only and IMAGE groups.

Pronyk *et al.* also used the IMAGE study to determine effects on IPV, unprotected sex, HIV incidence and risk behavior, and social capital. Pronyk *et al.* (2006) evaluated outcomes among 3 distinct cohorts: cohort 1 consisted of women receiving credit and education (same as Kim 2007); cohort 2 was comprised of household co-residents; and cohort 3 included community residents (control). In 2006, Pronyk found a 55% reduction in IPV among cohort 1 participants relative to women in the control group. However, there was no change in unprotected sex acts among cohort 2 or HIV incidence in cohort 3. The Pronyk *et al.* (2008a) study assessing social capital among the women in cohort 1 did not find significant changes in cognitive and social capital among intervention participants. Finally, the Pronyk *et al.* (2008b) study among women and poverty matched controls found that the intervention affected HIV risk behavior. Women in the intervention group were more likely to have accessed voluntary counseling and testing, had higher levels of HIV-related communication, and were less likely than control participants to have had unprotected sex at last intercourse.

Other articles leveraged various study designs to assess integrated microfinance and health education on HIV-related outcomes (Sherer *et al.*, 2004; Spielberg *et al.*, 2013; Arrivillaga *et al.*, 2014; Witte *et al.*, 2015). For instance, Spielberg *et al.* (2013) used the

Learning Games for Girls (LGG) method to combine savings and non-formal education to improve HIV-related knowledge, attitudes, and behaviors among SHG members and their daughters in India. In this cluster-RCT, the LGG offered to the intervention villages covered a range of financial and health topics. Control villages received no education after an introductory session. Using longitudinal surveys, authors found that savings education did not have a significant effect on earning or savings attitudes. However, LGG participants had significantly higher levels of HIV knowledge, attitudes, and behaviors ($p < 0.05$) compared with controls.

Improvements in HIV-related health knowledge were echoed in two non-experimental studies. Arrivillaga *et al.* (2014) conducted a pre-post test study without a control group among HIV-positive women on antiretroviral therapy in Colombia. Participants received HIV education combined with skills training and access to microfinance. Researchers found a significant increase ($p < 0.001$) across all outcomes, including knowledge of HIV/AIDS and treatment, adherence to treatment, and reported self-efficacy. Further, more than one-quarter of participants were able to start and sustain a microenterprise by follow-up. Sherer *et al.* (2004) conducted a multi-country analysis of micro-lending programs that provided bi-weekly HIV-related health education sessions to determine the effect on health knowledge, service utilization, and financial outcomes. The study included longitudinal surveys for financial outcomes and cross-sectional surveys for health outcomes for participants only. Clients were interviewed in Malawi, Thailand, and Guatemala. Researchers found insignificant gains in health knowledge in all three countries. They did find significant increases in utilization of primary care for child health as well as the percentage of women seeking care for STI symptoms. Researchers noted improvements in household income ranging from 22-64% and household savings from 20-42% in the intervention group only.

An integrated HIV-education approach was also used to study sexual risk behaviors. Witte *et al.* (2015) conducted a cluster-RCT in Mongolia in which female sex workers (FSW) received sexual risk reduction education, business training, and matched savings accounts. The

control group received only education. Using longitudinal surveys measured at four time points, researchers found that the intervention group experienced a 22% greater decrease in the number of sexual partners relative to the control group ($p < 0.001$) by time point 4. Although unprotected sex acts decreased across both groups, intervention FSW had greater odds of reporting no unprotected vaginal sex acts at 6 months (OR: 3.72, CI=-0.37, 7.80).

Air, water, and vector-borne diseases

Two studies integrated microfinance with health education related to air, water, and vector-borne diseases (De La Cruz *et al.*, 2009a; Panda *et al.*, 2015). De la Cruz *et al.* (2009) conducted a community-RCT in Ghana in which microfinance clients were randomized to receive either malaria education or standard diarrhea education by comparison. Controls were randomly selected non-clients in malaria education communities. After conducting cross-sectional baseline and follow-up surveys for each group, authors found an increase in malaria knowledge across all groups, potentially due to concurrent malaria initiatives in the communities. However, clients in the malaria education groups showed an increase in knowledge of warning signs during pregnancy ($p < 0.001$) and were more likely to have at least one ITN in the household.

Panda *et al.* (2015) integrated HMI with a community awareness campaign covering other vector, air, and water-borne illnesses for SHG member households in India. In this pre-post test study, two randomly selected cross-sections of SHG households responded to surveys assessing awareness and practice scores. Authors found significant increases in both awareness and practice scores for airborne diseases ($p < 0.001$) as well as for water-borne ($p < 0.01$) and vector-borne diseases ($p < 0.01$) after the awareness campaign. Average practices scores were generally lower than average awareness scores.

Child health and nutrition

Knowledge and behaviors were assessed for other areas such as breastfeeding, child health, and child nutrition using an integrated health education model (Hamad *et al.*, 2011; Ssewamala *et al.*, 2012; Flax *et al.*, 2014; Marquis and Colecraft, 2014; Marquis *et al.*, 2015a). Flax *et al.* (2014) used a cluster RCT to evaluate the effect of a microfinance, health education, and mobile health intervention on breastfeeding practices. Women in the intervention group received microloans, breastfeeding education, cell phone message reminders, and created songs and dramas to reinforce messages, whereas women in the control group received only microloans. Using longitudinal surveys, authors found an increase in the odds of exclusive breastfeeding at 6 months ($p < 0.001$) and an increase in timely initiation of breastfeeding ($p < 0.001$) for women in the intervention group.

Hamad, Fernald, and Karlan (2011) implemented a RCT in Peru to study the effect of child health education provided to microcredit loan groups. In this study, intervention clients received weekly education sessions on integrated management of childhood illnesses, while controls received only microcredit services. They found at endline that caregivers in the intervention group were more knowledgeable about diarrhea danger signs ($p < 0.01$) and doctor's office activities ($p < 0.01$). They also found that less educated parents in the intervention group demonstrated more knowledge about doctor's office activities than more highly educated parents in the same group. Despite the increase in knowledge, there were no differences in health status or anthropometric measures.

Child nutrition was the main focus of two articles by Marquis *et al.* (2014, 2015) covering a single intervention in Ghana. Using a quasi-experimental design, authors explored the effect of weekly nutrition education sessions and entrepreneurship training for caregivers of 2-5 year olds on children's height, weight, and consumption of animal source foods. The intervention group received nutrition information, microloans, and business training. The comparison group consisted of caregivers in intervention villages who opted not to take out loans but may have

been exposed to open-air education sessions. The control group received neither education nor loans. Using longitudinal surveys at four time points, Marquis *et al.* (2014) found significant increases in height-for-age ($p=0.02$) and weight-for-age ($p=0.002$) z-scores over time as well as BMI-for-age ($p<0.001$) scores at study mid-point for children in the intervention group relative to the control group. In a fixed effects model, there were some significant improvements in outcomes for the comparison group relative to the control group, suggesting the comparison group may have benefitted from open-air education. Marquis and Colecraft (2015) found at endline only that the consumption of meat ($p<0.001$), fish ($p=0.003$), poultry ($p<0.001$), and milk products ($p<0.001$) was greater in the intervention relative to the control group.

Ssewamala *et al.* (2012) applied an integrated approach to help school-aged orphans (mean age 13.7 years) battle depression. In this cluster RCT, a microfinance package, including a matched savings account and an adult mentor, was provided to children already receiving counseling and health education via a national school curriculum. Controls were orphans receiving only the standard health education. Authors implemented longitudinal surveys at baseline, 10-12 months, and 20-24 and found a significant decrease in mean depressive symptoms among the intervention group relative to control students ($p<0.001$) at both time points.

Health education with linkages to provision of health care

For the following studies, interventions focus foremost on health education and have a secondary component that provides a link to health services (Amin *et al.*, 2001; Smith, 2002; Roy *et al.*, 2008; Swendeman *et al.*, 2009). The linkage to health and support services in these studies is facilitated by health centers, peer educators, or program staff. For example, Amin *et al.* (2001) used a quasi-experimental design to assess the effect of integrating microcredit with a combined packaged of family planning, childhood immunization, and an Essential Services Package (ESP) on reproductive, maternal, and child health outcomes. In the first phase of the

study, the experimental area received microloans combined with family planning education and childhood immunizations. In the second phase, clinic-based ESP was added to the intervention package. Cross-sectional surveys were conducted at baseline, after phase 1, and after phase 2. Over a six-year period, Amin *et al.* found a significant increase in contraceptive use as well as dissemination of information and utilization of ESP in the community at large. Authors also note a significant decline in fertility, but there was no significant decrease in the infant mortality rate within project areas.

In a quasi-experimental study, Swendeman *et al.* (2009) examined the effect of the Songachi empowerment intervention on HIV prevention outcomes for FSW in India. The intervention combined microfinance cooperative membership with an STD/HIV prevention program, which was delivered by peer educators who also provided linkages to STD/HIV testing and treatment services. A control group of FSW received the STD/HIV prevention program but did not have access to the cooperative. Using longitudinal surveys at four time points, researchers found the intervention improved several outcomes: knowledge of STDs and condom protection; cognitive, behavioral, and affective skills in sexual and work place negotiations (i.e. increased condom decision-making); social support among FSW; and savings and alternative incomes.

Smith (2002) conducted a quasi-experimental study to compare a conventional village bank with an integrated village health bank in Ecuador and Honduras. This integrated model combined microfinance with maternal and child health education and promotion activities, including monitoring of immunizations, child weigh-ins, and referrals to health providers. Women in the comparison group participated only in the village bank, whereas women in the control group participated in neither village nor health bank. Using cross-sectional baseline and follow-up surveys, the author found that the health bank model reduced the number of cases of diarrhea in Honduras; however, results from Ecuador suggest that the village bank model alone may lower the rates of diarrhea, but the health education add-on did not provide further benefit.

In both countries, participation in the health-bank model improved health utilization, particularly cancer screening, relative to credit-only participation.

The Roy *et al.* (2008) quasi-experimental study evaluated the effect of combining the Rural Maintenance Program (RMP) with a nutrition education intervention on women's nutritional status and iodized salt intake as well as children's immunizations. The RMP employed and trained women to maintain rural roads in Bangladesh. In the intervention group, RMP members received nutrition education as well as linkages to microcredit and health services, including referrals to health centers. The comparison group received only RMP training, while the control group received neither training nor education. Using longitudinal surveys, authors found a mean net weight gain for the intervention group (+1,333g) compared with a net loss in weight for the comparison (-147g) and control groups (-277g) ($p < 0.001$). The intervention group also experienced an increase in knowledge of how to use packaged iodized salt relative to the control group ($p < 0.001$). Child vaccinations increased across all groups.

B. Health financing and health micro-insurance (HMI)

Five studies (14.3%) assessed the effect on client outcomes of incorporating microfinance with health-related financial services; namely, microloans for health providers to invest in their health care related business or health micro-insurance (HMI) products for MFI members. Additional studies offered health insurance as part of a broader package of health services (Ahmed *et al.*, 2006; Saha *et al.*, 2015); however, the five articles discussed here focused on the specific effect of health financing products on client outcomes.

Three studies offered HMI to microfinance or SHG clients (Hamid *et al.*, 2011; Banerjee *et al.*, 2014; Landmann and Frolich, 2015). Hamid's (2011) non-experimental study used a cross-sectional survey to compare health outcomes of Bangladeshi households with varying exposure to Grameen Bank HMI. They found that more established HMI clients (those with HMI for at least 5 years) had greater health awareness and were also more likely to utilize health

services ($p < 0.01$) than households without HMI. However, there were no reported improvements in health status. Landmann & Frolich's (2015) randomized trial provided evidence of positive effects of HMI on child well-being in Pakistan. MFI clients in the intervention group were eligible for voluntary health insurance for supplemental household members. The comparison group received standard coverage. The intervention group experienced a significant decrease in child engagement in hazardous occupations and child earnings ($p < 0.01$), thereby improving children's ability to attend school and overall well-being, relative to households unable to extend insurance to other members of their household. Banerjee's (2014) community randomized trial in India, on the other hand, showed an overwhelming negative effect of *compulsory* health insurance on client borrowing. Clients in treatment villages were required to purchase health insurance along with micro-loans. Despite that the HMI policy was small compared to the average loan (525 rupees vs. 8000 rupees, respectively), this resulted in treatment villages being 23% less likely than control villages to take out loans within one year of intervention implementation ($p < 0.001$), representing a net loss in access to microfinance.

Two articles explore a unique health financing intervention in Uganda where microloans were provided to midwives for improved infrastructure, training, and health related products including drugs (Agha *et al.*, 2004; Seiber and Robinson, 2007). In 2004, the Agha *et al.* (2004) quasi-experimental study used cross-sectional baseline and follow-up surveys to assess quality perceptions and service utilization for clients accessing midwife-owned health clinics. Intervention clinics were non-randomly assigned to receive business skills trainings along with micro-loans. Clients at intervention clinics experienced significant improvements in utilization as well as increased perceptions of quality across four of eight indicators. Three years later, Seiber and Robinson (2007) also used cross-sectional surveys at two time points to evaluate the same outcomes. They found that perceived quality improved on 6 of 8 indicators at intervention clinics versus just 2 in control clinics ($p < 0.05$). Supplemental exit interviews with clients

suggested loyalty to clinics was driven in large part by availability of drugs, which were often made possible via midwife loans.

C. Linkages to health providers (direct or indirect)

The third health component category covers integrated interventions that provide health services, either directly through health centers and community health workers (CHW) or by facilitating linkages to various health providers. Four studies (11.4%) in this review explored the effect of integrating microfinance with some level of service provision (Dohn *et al.*, 2004; Odek *et al.*, 2009; Desai and Tarozzi, 2011; Muñoz *et al.*, 2011). No studies explored the effects of MFI owned and operated health centers on client outcomes.

The most rigorous study in this category did not find notable positive effects. Desai and Tarozzi's (2010) community RCT in Ethiopia examined the effect of linking microloans and a family planning program on contraceptive use. There were four communities in the study: the intervention group received an integrated approach combining microloans and family planning services delivered through CHWs; a comparison group received only microloans; another comparison group received only family planning; and the control group received neither. Cross-sectional surveys were conducted at baseline and follow-up. Authors found that the integrated program did not increase contraceptive use more than either intervention on its own, refuting the hypothesis of an added benefit through integration. Moreover, no group increased contraceptive use significantly more than the control group.

Dohn *et al.* (2004) conducted a similar quasi-experimental study in the Dominican Republic that assessed the effect of microcredit and health promotion programs on childhood illness and women's health. The first community received the full intervention: microloans, savings, and financial management training along with health information and services delivered door-to-door by community-based health promoters. A second community received only microcredit services, while a third received only health promotion services. Using cross-

sectional baseline and follow-up surveys, authors found significant improvements in 8 of 11 health indicators for the full intervention group ($p < 0.05$); 5 of 11 indicators for the health promotion group ($p < 0.05$); and no significant changes for the microcredit only group between time points. The degree of change was significant between communities ($p < 0.001$).

The Muñoz *et al.* (2011) quasi-experimental study in Peru and the Odek *et al.* (2009) non-experimental study in Kenya generated more promising results. Muñoz *et al.* assessed if community-based directly observed therapy for highly active antiretroviral therapy (DOT-HAART) and matched economic and social support could improve treatment adherence for co-infected HIV-TB patients. This study included 60 poor patients about to begin HAART as well as 60 matched controls also about to begin treatment. The experimental group was provided with home-based supervised treatment as well as support groups and microloans. At two years, Muñoz found that individuals in the intervention group were more likely to be on HAART (87% vs. 52%, $p < 0.01$) and report adherence to treatment relative to controls (79% vs. 41%, $p < 0.01$). Authors also found that more TB patients in intervention group completed treatment as a cure relative to controls (82% vs. 49%, $p < 0.01$). Intervention patients also experienced improved psychosocial factors such as reduced stigma and increased social support ($p < 0.01$).

Odek *et al.* explored a peer-mediated HIV prevention intervention in Kenya. In this pre-post test design, FSW were provided with microloans for small business ventures and worked with a peer educator on HIV prevention and condom promotion. Peer educators also provided linkages to services like testing and treatment. This study found a significant reduction in mean number of sexual partners (3.26 to 1.84, $p < 0.001$) and an increase in already-high levels of consistent condom use with regular partners (79% to 94%, $p < 0.001$). Furthermore, nearly half of participants had exited sex work by follow-up.

The studies above focus specifically on understanding the effect of integrating microfinance and service provision. It is noteworthy that six other studies also provided linkages to health services, though these are categorized elsewhere as this was considered a more minor

component. Similarly, six other studies included CHWs but did so as part of a larger health intervention (see Table 3.3).

D. Access to health products

Two studies combined microfinance and health specifically to expand access to health products (Freeman *et al.*, 2012; Tarozzi *et al.*, 2014a). Tarozzi *et al.* (2014) conducted a cluster-RCT in India to evaluate if offering small loans for the purchase of ITNs would lead to increased ownership and usage of ITNs as well as improvements in overall health status. In treatment villages, households received malaria information along with the option to take out a loan for ITNs. Comparison villages received the malaria campaign and were offered ITNs at no cost. Control villages received neither information nor ITNs. Later, 40 new villages were selected to receive information and the option to purchase ITNs with cash. Using longitudinal surveys, Tarozzi found that ITN acquisition was 52% in the intervention group. This seems low when compared with 96% in the comparison group; however, it is notable that more than half of households were willing to take out loans for ITNs. In cash villages, uptake was significantly lower than in loan villages (11% versus 52%, $p < 0.01$). Authors also found that ITN utilization rates increased 9 percentage points (pp) for the intervention group but more significantly for free villages (38pp). Finally, malaria incidence declined in free ($p < 0.05$) and loan ($p < 0.01$) villages relative to control communities, but there was not a significant change in prevalence.

Similar to the ITNs in Tarozzi's study, Freeman (2012) used a post-test only design to assess the effect of offering a loan to purchase a Pureit water filter on water treatment practices in India. All SHG members were offered water safety education and then could opt to take out a loan to purchase a water filter. Overall, there was suboptimal water quality, even among those who purchased the filter. However, those who purchased the filter were more likely to treat drinking water (92.5% vs. 58.3%, $p < 0.001$) and had better overall water quality (mean thermotolerant chloroform count 13.7 vs. 44.5, $p < 0.01$) than those who did not.

E. Multiple Components

As shown in Table 3.3, many studies combined two or more health components. From a programmatic perspective, this is meant to provide clients with multimodal support so as to ensure success and improvements in their health. From an evaluation perspective, most of these studies are examining the effect of the combined intervention and not the effects of component parts. The four studies (11.4%) identified as incorporating multiple components are discussed below (Hadi, 2001, 2002; Ahmed *et al.*, 2006; Saha *et al.*, 2015).

Three of the studies are from Bangladesh. Ahmed *et al.* (2006) worked with the longstanding BRAC program to conduct a quasi-experimental study examining if an integrated program could change health-seeking behavior of the ultra-poor. Program villages were randomly sampled from three purposively selected districts. All households qualified for the intervention consisting of asset grants and skills training combined with essential health services, counseling, latrine installation, and more. Control households were randomly selected ultra-poor households from the same villages and did not receive either microfinance or health services. Using longitudinal surveys, authors did not find a significant difference in care-seeking behavior at formal providers between groups. Intervention households also exhibited increased health knowledge and awareness of resources. Poverty status also improved, thereby increasing capacity for health expenditures.

Hadi conducted two studies with distinct emphases. Hadi (2001) assessed the effect of health promotion activities delivered through an MFI on women's knowledge of pre-and post-natal care. Health promotion activities included health education, CHWs, and direct provision of some health services. Hadi used a cross-sectional survey to compare four strata of women: women in credit groups >5 years; women in credit groups <5 years; poor women who were eligible but did not join (referent group); and women of non-eligible households. Those who participated in the integrated credit groups had net positive improvements in pre- and post-natal care knowledge ($p < 0.05$) relative to the referent group. Longer duration of involvement

was associated with increased knowledge. Media exposure was also significantly correlated with increase knowledge, except for knowledge of tetanus vaccines. Hadi's second article (2002) also used one cross-section of data to examine the effect of an integrated program on maternal knowledge of prevention and symptoms of acute respiratory infections (ARI) for children under 5 years. Intervention villages received microcredit services and CHW outreach to detect and treat ARI, while comparison villages received credit only. Hadi found a net positive effect of the program. Specifically, 34% of women in ARI education communities could name at least 4 clinical signs of ARI compared with 15.8% in non-ARI communities ($p < 0.01$). Prevention knowledge increased in credit-only villages, but the effect was greater when microfinance and health were combined.

In the Saha, Kermode, and Annear (2015) quasi-experimental study in India, authors investigated if adding a multi-component health intervention to a microfinance-based SHG improved health behaviors and outcomes. In the intervention group, women received mobile health camps, health education, awareness campaigns, and insurance. In the comparison villages, pair-matched women received microfinance but not health services. Using longitudinal surveys, authors found that the intervention group had higher odds of delivering babies in a formal institution (OR: 5.08, 95% CI: 1.21-21.35) and feeding babies colostrum (OR: 2.83, 95% CI: 1.02-5.57) than the comparison group. There were no significant improvements in incidence of diarrhea in children or money spent on treatment.

Discussion

It is important to understand the effect of combining microfinance and health interventions because they have the potential to be scaled up and contribute to poverty alleviation and improved health outcomes for some of the 195 million and growing MFI clients worldwide (Maes and Reed, 2012). Indeed, the geographic diversity of studies demonstrates the ubiquitous uptake of integrated microfinance and health as a viable development strategy. This

review summarizes the evidence through 2015 and adds 19 new studies to the previous review (Leatherman *et al.*, 2012). Leatherman's review included only 2 of 17 (11.7%) studies with RCT designs, while this review includes equal numbers of studies with either RCT or quasi-experimental study designs (42.9%, respectively). The increase in studies, particularly RCTs, over the past five years suggests that researchers are trying to better understand the merits of this approach and isolate the causal link between integrated components and outcomes of interest.

Despite improvements in research design, on average, these studies provide a moderate quality of evidence. Some of the key design issues were: small number of clusters or small sample size, lack of a randomized control group, and selection bias. Given the group nature of microfinance programs, nearly all studies, including RCTs, involved clustering at the group or community levels. Having too few clusters is a frequent problem in community-based RCTs (Atienza and King, 2002; Donner and Klar, 2004). Self-selection into community-based programs is a particular problem in microfinance research along with non-random placement of MFIs. Taken together, these issues limit generalizability of findings beyond program participants and may signify that control groups of non-microfinance participants or communities without MFIs are not comparable to those receiving the interventions. Similar selection effects have been reported in other types of community-based intervention studies (Hill *et al.*, 2010). The moderate quality of studies may also be due to the fact that integrated microfinance and health programs are structural interventions that are arguably more challenging to evaluate. Structural interventions alter cultural, economic, or other contexts in order to improve health. As such, integrated programs represent an intersectoral approach that may have complex or indirect causal pathways that include less understood latent variables, such as women's empowerment. Although randomized designs represent a gold standard, they can be challenging to implement in this context, with half of RCTs in this review being downgraded for methodological issues. More credence may be given to quasi-experimental

studies as an appropriate evaluation design for these types of interventions (Victora *et al.*, 2004).

To facilitate our analysis, we grouped the microfinance and health literature by health component. The largest number of studies (20) had interventions that included health education or promotion. Despite the wide variety of health topics and differences in research designs, many of the studies found increases in health knowledge or awareness among intervention participants when a health education component was integrated with microfinance (Roy *et al.*, 2008; De La Cruz *et al.*, 2009a; Swendeman *et al.*, 2009; Hamad *et al.*, 2011; Freeman *et al.*, 2012; Spielberg *et al.*, 2013; Arrivillaga *et al.*, 2014; Flax *et al.*, 2014). More than half of the studies on microfinance and health promotion also measured behavior change. Most of these documented improved health behaviors or practices (Amin *et al.*, 2001; Sherer *et al.*, 2004; Pronyk *et al.*, 2006; Kim *et al.*, 2007; Pronyk *et al.*, 2008a, 2008b; Kim *et al.*, 2009; Swendeman *et al.*, 2009; Flax *et al.*, 2014; Marquis and Colecraft, 2014; Marquis *et al.*, 2015a; Panda *et al.*, 2015), but some found no changes or changes in only select behaviors (Smith, 2002; Roy *et al.*, 2008; De La Cruz *et al.*, 2009a; Spielberg *et al.*, 2013). Few of the microfinance and health education studies measured effects on health outcomes and the evidence from these was mixed. Marquis and Ssewamala found improvements in child anthropometry and depressive symptoms, respectively, while Amin detected decreased fertility, but no change in infant mortality. The pathway between the intervention and improved health outcomes may be long and complex; for example, knowledge, attitudes, and behaviors may need to change before we can measure an effect on health status. Future evaluations might consider extending program duration between time points in order to detect a significant or programmatically meaningful change in health outcomes, particularly at the community level.

There were smaller numbers of studies in each of our four other groupings of microfinance and health literature, and the results of these studies were highly mixed. Although it is difficult to draw firm conclusions, some important points for practitioners arise from

reviewing these categories of microfinance and health studies. Under health financing and HMI, microloans to health providers may be an effective way to improve perceived quality of health services and service utilization (Agha *et al.*, 2004; Seiber and Robinson, 2007). More research is needed in this area with other types of health providers and in diverse operational settings. HMI linked to microfinance demonstrated mixed effects across three studies. Bundling these products may increase use of health services, as shown by Hamid, but it is not clear whether it modifies health outcomes. Furthermore, although Landmann and Frolich found positive effects of HMI and microfinance on child labor, Banerjee found that clients were so opposed to compulsory bundled insurance that it actually resulted in a net loss in access to microfinance. This raises questions about study populations, their desires for MHI, and the compulsory versus voluntary nature of the products.

Microloans linked to health providers, either directly or indirectly, may have an effect on health behaviors (Dohn *et al.*, 2004; Odek *et al.*, 2009; Muñoz *et al.*, 2011). Dohn's study further suggests there may be a benefit of an integrated program over health promotion or microloans alone. Desai and Tarozzi's study linking microloans and a family planning program delivered through CHWs had a null effect on contraceptive use. However, this study along with Banerjee's study of compulsory bundled health insurance point to the importance of collecting formative data in planning health interventions (Gittelsohn *et al.*, 2006). In both studies, the interventions were not well targeted to the needs of participants, which likely explains their notable unintended negative consequences and lack of effect (Desai and Tarozzi, 2011; Banerjee *et al.*, 2014).

The two studies that evaluated the effect of integrating microfinance with access to health products were unique in that they each offered a loan for the express purpose of purchasing a health product. Tarozzi's study offering microloans to purchase ITNs shows promise in terms of willingness to pay and to use the product. Freeman's Pureit water filter study showed those who took out loans were more likely to adopt healthy behaviors; however,

the study itself did not have an overall positive effect on water quality or client health. These studies suggest that there may be a market for providing loans to purchase health products but effect on client health is unclear. Additional research on microfinance and access to health products is needed.

Four studies in this review were considered to have multiple components. They increased health knowledge (Hadi 2001, Hadi 2002) and improved some health behaviors, but not others (Ahmed *et al.*, 2006; Saha *et al.*, 2015). Many of the other studies in this review also included two parts or multiple parts within a category (e.g., different types of health education). The main challenge with studies that include multiple parts is that it is difficult to determine which component is driving changes in health knowledge, behaviors, or outcomes. The studies by Dohn and Desai and Tarozzi are examples of designs intended to measure the separate and combined effects of two interventions. Adding an element of randomization to single or combined interventions would further strengthen the ability of researchers to determine causality (Atienza and King, 2002). In some cases, where multiple components are included, it may be necessary for researchers to have more than one type of control in order to more clearly understand the effect of each component.

Limitations

This review has some limitations, which constrain our ability to draw firm conclusions. While the number of studies documenting the effect of integrated microfinance and health interventions has nearly doubled in five years, the wide variety of types of interventions and outcomes measured make it difficult to summarize the microfinance and health literature. While there are an increasing number of studies integrating microfinance and health education or promotion, more studies are needed on integration of microfinance with other types of health-related interventions.

Conclusions

Most low- and middle-income countries, with few notable exceptions, remain challenged to foster and sustain integrated approaches that improve access to care and coverage rates for simple, yet lifesaving interventions (Bhutta and Black, 2013). Too often, the ill health of children and family members impinges on the ability of women to generate income given their responsibility to care for sick family members (Banthia *et al.*, 2009). This further erodes the household's potential for economic and social development. Even when economic status is improved, health shocks can erase gains. In addition to generating a lower income due to missed days, women may need to divert savings and loan funds from productive activities to healthcare expenses. This illustrates the inextricable relationship between poverty and ill health. Cross-sectoral approaches such as integrated microfinance and health interventions are a response to this complex issue, seeking to build livelihoods and incomes while providing education and a safeguard against higher impact illnesses.

There is strong evidence supporting the integration of microfinance and health education or promotion programs. These interventions regularly improved health knowledge and behaviors but rarely successfully measured changes in broader health outcomes. Future research should include more indicators of health status and document the pathway from knowledge to behavior to outcome. Measuring health outcomes (e.g., anthropometry, diarrhea incidence, or child mortality) may require longer intervention periods and larger sample sizes, but would ultimately provide better evidence of public health impacts. Stronger randomized research designs would improve the quality of evidence, and designs with multiple study arms will be required to disentangle the effects of multiple component microfinance and health interventions. Some studies in this review measured changes in income or savings, but very few attempted to parse out the effects of integrated approaches on household economic outcomes. This type of research is needed to understand whether health impacts are related to the income effects of microfinance, to the health component of the intervention, or to synergism between

the microfinance and health components. The evidence on integrating microfinance and health continues to indicate the promise of this cross-sectoral development approach in improving the lives of poor women and their families.

Figures and Tables

Figure 3.1 PRISMA Diagram

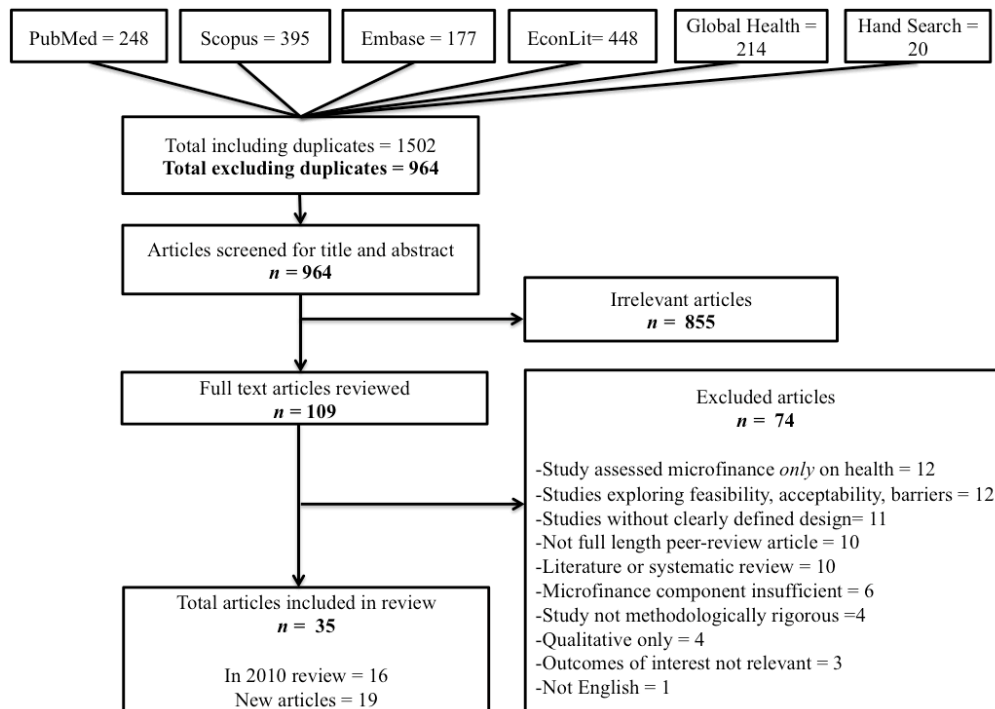


Table 3.1 Health Components and Example Interventions

<i>Health Component</i>	<i>Example Interventions</i>
Health education and promotion	<ul style="list-style-type: none"> • Interactive sessions on topics such as prenatal health, safe birth, nutrition, common childhood illnesses, malaria, HIV/AIDS, prevention of non-communicable diseases and water and sanitation • Training on coping with health-related financial shocks, planning ahead to face common health expenses
Health financing and health micro-insurance (HMI)	<ul style="list-style-type: none"> • Health loans (at individual and/or group level) • Health savings (at individual and/or group level) • Loans for health insurance premiums and linkages to health micro-insurance for the individual or household
Linkages to health providers (direct or indirect)	<ul style="list-style-type: none"> • Organization of mobile health services with public and private providers to deliver preventive and diagnostic services in remote or rural areas • Development of regional networks of providers who agree to provide a range of services for fixed or discounted prices • Referrals to private and public providers for secondary care • Prepaid-care programs with discounted primary care for rural clients
Access to health products	<ul style="list-style-type: none"> • Door-to-door visits by trained village entrepreneurs who reinforce health education messaging, sell health products and medicines and provide referrals to local healthcare providers • Sales of health products such as insecticide-treated nets, family planning products, oral rehydration solution, and home water treatment and storage devices • Micro-franchise distribution of affordable, essential drugs
Multiple components	<ul style="list-style-type: none"> • Any interventions employing a combination of more than 2 of the abovementioned categories (i.e. health education plus linkages to health providers plus micro health insurance)

Table 3.2 General Study Data including Intervention Descriptions

Study (date)	Country	Study aim	Intervention
Agha <i>et al.</i> (2004)	Uganda	Assess the impact of business skills training and loans to private sector midwives on client perceptions of quality and patient loyalty	Business skills training and micro loans to private sector midwives
Ahmed <i>et al.</i> (2006)	Bangladesh	Examine if a targeted intervention could change health-seeking behavior of ultra-poor towards greater use of formal health services	BRAC program (CFPR/TUP): asset grants & skills training combined with essential health services, counseling, latrine installation, etc.
Amin <i>et al.</i> (2001)	Bangladesh	Assess the impact of integrating a micro-credit program with family planning, extended immunizations, and a Essential Services Package (ESP) on reproductive, maternal, and child health outcomes	Phase 1: Micro-credit plus family planning and extended program on immunizations Phase 2: Phase 1 plus incremental addition of ESP (reproductive, maternal, and child health services)
Arrivillaga <i>et al.</i> (2014)*	Colombia	Evaluate the effectiveness of an intervention combining microfinance, entrepreneurship, and adherence to treatment for women living with HIV/AIDS in Cali, Colombia	HIV/AIDS education combined with technical skills training and microfinance
Banerjee <i>et al.</i> (2014)*	India	Test if bundling health insurance with microfinance would lead to a larger client base (addressing concerns of both demand and adverse selection)	Compulsory health insurance bundled with microfinance loans
De la Cruz <i>et al.</i> (2009)	Ghana	Evaluate the impact of malaria education on knowledge, prevention, early detection, and treatment-seeking behaviors	Malaria education for micro-credit clients
Desai and Tarozzi (2010)	Ethiopia	Evaluate the effect of linking micro-credit and family planning programs on contraceptive use	Combined microcredit and family planning services
Dohn <i>et al.</i> (2004)	Dominican Republic	Assess the impact of microcredit and health promotion programs on childhood illness and women's health, tested separately and as an integrated approach	Micro-credit program combined with community health promotion and linkages to services
Flax <i>et al.</i> (2014)*	Nigeria	Assess whether women receiving a health education and mobile health intervention integrated in microcredit would be more likely to breastfeed exclusively to six months (compared with women in microcredit only)	Microcredit combined with breastfeeding education, cell phone messaging, and songs and dramas
Freeman <i>et al.</i> (2012)*	India	Evaluate the extent to which providing water safety education and microloans for water filters improved drinking water quality	Integrated water safety education and microloans for the purchase of water filters provided to SHGs
Hadi (2001)	Bangladesh	Assess the contribution of health promotion activities administered through a microcredit institution on women's knowledge of pre-and post-natal care	Integrated microcredit and health, including health education, community health workers, and direct provision of health services

Hadi (2002)	Bangladesh	Assess the combined effect of a microcredit program and community health workers on maternal knowledge of prevention and symptoms of acute respiratory infections (ARI) in children <5	Microcredit plus community health worker outreach to detect and treat ARIs
Hamad, Fernald, & Karlan (2011)*	Peru	Investigate the effects of a microfinance and integrated management of childhood illness-based health intervention on child health outcomes and parental knowledge	Child-health education provided to microcredit loan groups
Hamid, Roberts, & Mosley (2011)*	Bangladesh	Explore the added effect of micro-health insurance on health outcomes for microcredit clients in Bangladesh	Micro-health insurance scheme provided for Grameen Bank microcredit clients
Kim <i>et al.</i> (2007)	South Africa	Examine the impact of combining micro-loans with comprehensive training and education for intimate partner violence (IPV) and HIV prevention on women's empowerment	Integrated micro-loans and comprehensive training and education on intimate partner violence and HIV prevention
Kim <i>et al.</i> (2009)	South Africa	Compare the impact of combining micro-loans with comprehensive training and education for intimate partner violence (IPV) and HIV prevention on women's empowerment with the impact of microfinance alone	Integrated micro-loans and comprehensive training and education on intimate partner violence and HIV prevention
Landman & Frolich (2015)*	Pakistan	Estimate the effects of extending a health insurance product to additional household members on child labor in Pakistan	Voluntary micro health insurance to supplementary household members for microfinance clients; support with filing claims
Marquis & Colecraft (2014)*	Ghana	Test the effect of an entrepreneurial and nutritional education intervention with microcredit on the consumption of animal source foods and overall diet of children between 2-5 years	Microcredit combined with weekly nutrition education and entrepreneurship training with caregivers of 2-5 year old children
Marquis <i>et al.</i> (2015)*	Ghana	Test the effect of an entrepreneurial and nutritional education intervention with microcredit on household access and children's use of animal-source foods (ASF) in rural Ghana	Microcredit combined with weekly nutrition education and entrepreneurship training with caregivers of 2-5 year old children
Muñoz <i>et al.</i> (2011)*	Peru	Determine if a community-based DOT-HAART and matched economic and social support intervention can improve treatment adherence for HIV patients after 2 years	Community-based accompaniment with supervised anti-retroviral combined with microfinance and social support groups
Odek <i>et al.</i> (2009)*	Kenya	Assess the individual-level effects of adding microenterprise services to a peer mediated HIV/AIDS prevention intervention	Microfinance loan for small business ventures combined with HIV/AIDS prevention, condom promotion, linkages to care for FSW via peer educators

Panda, Chakraborty, & Dror (2015)*	India	Evaluate the effectiveness of an awareness campaign in increasing knowledge about vector and water-borne illnesses as well as enhancing preventive practices in rural communities	Community-based health insurance combined with campaign for awareness of air, water, and vector-borne diseases for SHG members
Pronyk <i>et al.</i> (2006)	South Africa	Examine the impact of combining micro-loans and a comprehensive training and education intervention on IPV (cohort 1), unprotected sexual intercourse (cohort 2), and HIV incidence (cohort 3)	Integrated micro-loans and comprehensive training and education on intimate partner violence and HIV prevention
Pronyk <i>et al.</i> (2008a)	South Africa	Assess effects of combined microfinance and training intervention on social capital among young female participants in rural South Africa	Integrated microfinance with education/training on HIV/AIDS
Pronyk <i>et al.</i> (2008b)	South Africa	Assess effects of combined microfinance and training intervention on HIV risk behavior among young female participants in rural South Africa	Integrated microfinance with education/training on HIV/AIDS
Roy <i>et al.</i> (2008)*	Bangladesh	Assess whether a nutrition intervention could improve the nutritional status, knowledge, and practices of women in the Rural Maintenance Program	Nutrition education package (food hygiene and preparation) combined with program that employs and trains women to maintain rural roads. Also, linkages to health services and access to microcredit
Saha, Kermode, & Annear (2015)*	India	Investigate if combining a health intervention with a microfinance-based SHG improves health behaviors and outcomes	SHGs with access to microfinance institutions offering diverse health products (i.e. mobile health camps, health education, health awareness campaigns, and insurance)
Seiber & Robinson (2007)	Uganda	Assess the impact after 2 years of micro-loans and business skills training on client perceptions of quality and patient loyalty for preventive and curative health services	Business skill training and micro-loans to private sector providers
Sherer <i>et al.</i> (2004)	Malawi, Guatemala, Thailand	Assess the impact of integrated micro-lending and health education on income, health knowledge, and use of health services in 3 countries with high levels of HIV prevalence	Integrated microcredit and biweekly 1-hour health education sessions
Smith (2002)	Ecuador & Honduras	Compare conventional village banking with a health-bank model (combining microfinance and health education services)	Health banks that integrate microfinance and health education
Spielberg <i>et al.</i> (2013)*	India	Test the effect of a combined savings and non-formal education methodology on HIV knowledge, attitudes, and behaviors	Learning Games for Girls (LGG) covering financial and health topics delivered to SHG members
Ssewamala <i>et al.</i> (2012)*	Uganda	Examine the impact of a comprehensive microfinance intervention on depression among orphaned children in Uganda	Microfinance package (matched savings account, financial management training, and an adult mentor) with school health

Swendema n <i>et al.</i> (2009)*	India	Examine the effects of the Songachi empowerment intervention on HIV prevention outcomes	STD/HIV prevention program, sex worker community organization, and microfinance cooperative
Tarozzi <i>et al.</i> (2014)*	India	Evaluate if offering small loans for purchase of insecticide treated nets (ITNs) led to increase in ownership, usage, and health status	Malaria information campaign combined with microloans for ITNs (includes purchase and re-treatment with one-year repayment contract)
Witte <i>et al.</i> (2015)*	Mongolia	Test a savings-led microfinance and HIV prevention intervention on sexual risk reduction	HIV sexual risk reduction plus microfinance intervention (training and matched savings)

*New in 2015

Table 3.3 Studies by Intervention Health Component

Study	Health Education	Health financing & HMI		Linkages to Health Providers			Health Products
	Health education and promotion	Access to health-related financial services	Micro-loans to private health provider	Direct provision of health services	Linkage to health services	Community health worker	Access to health-related products
Agha <i>et al.</i> (2004)		X					
Ahmed <i>et al.</i> (2006)	X	X		X	X	X	
Amin <i>et al.</i> (2001)	X					X	
Arrivillaga <i>et al.</i> (2014)	X						
Banerjee <i>et al.</i> (2014)		X					
De la Cruz <i>et al.</i> (2009)	X						
Desai and Tarozzi (2010)					X	X	X
Dohn <i>et al.</i> (2004)	X				X	X	
Flax <i>et al.</i> (2014)	X						
Freeman <i>et al.</i> (2012)	X						X
Hadi (2001)	X			X	X	X	X
Hadi (2002)	X			X	X	X	X
Hamad, Fernald, & Karlan (2011)	X						
Hamid, Roberts, & Mosley (2011)		X					
Kim <i>et al.</i> (2007)	X						
Kim <i>et al.</i> (2009)	X						
Landmann & Frolich (2015)		X					
Marquis & Colecraft (2014)	X						
Marquis <i>et al.</i> (2015)	X						
Muñoz <i>et al.</i> (2011)				X		X	X
Odek <i>et al.</i> (2009)	X				X	X	
Panda, Chakraborty, & Dror (2015)	X	X					
Pronyk <i>et al.</i> (2006)	X						
Pronyk <i>et al.</i> (2008a)	X						
Pronyk <i>et al.</i> (2008b)	X						
Roy <i>et al.</i> (2008)	X				X		
Saha, Kermode, & Annear (2015)	X	X		X		X	X
Seiber & Robinson (2007)		X					
Sherer <i>et al.</i> (2004)	X						
Smith (2002)	X				X		
Spielberg <i>et al.</i> (2013)	X						
Ssewamala <i>et al.</i> (2012)	X						
Swendeman <i>et al.</i> (2009)	X				X		
Tarozzi <i>et al.</i> (2014)	X						X
Witte <i>et al.</i> (2015)	X						

CHAPTER 4. DOES INTEGRATING MICROFINANCE AND HEALTH IMPROVE CLIENT FINANCIAL OUTCOMES? EVIDENCE FROM A CLUSTER RANDOMIZED TRIAL IN BENIN

Overview

Introduction: Integrated microfinance and health (IMH) programs provide clients with access to financial resources as well as health products and services in an effort to address the intertwined issues of poverty and ill-health that persist for millions of households in low- and middle-income countries. To support the integration of these two sectors, it is crucial to understand both the health and financial implications of bundling these services. Several studies have demonstrated that IMH programs lead to gains in health knowledge, attitudes, and some behavior changes. However, the effect on client financial outcomes, such as revenue and profit, is not well-understood.

Methods: We used data from a cluster randomized control trial in Benin. Microfinance villages were randomized to receive credit-only or Credit with Education (CwE), which integrated group-based loans and a 10-week health education program. We conducted a difference-in-differences analysis, comparing trends in client reported revenue and profit between credit-only and CwE villages.

Results: In the OLS model, participating in the CwE program was associated with an average decrease in revenue of USD 20 and an average decrease in profit of USD 3 relative to the credit-only group; however, these results were not statistically significant. In the GLM model, CwE participation was associated with an average decrease of USD 18 in revenue, which was approaching statistical significance ($p = 0.052$). The effect on profit was negative but insignificant.

Discussion: Although integrated microfinance and health programs have demonstrated positive effects on client health knowledge and some behaviors, the negative effects of CwE on revenue and profit challenge the perception that integrated programs produce synergistic effects. CwE participants may be faced with a variety of trade-offs, both in their health and financial decision-making. Self-selection and unobserved characteristics, such as empowerment, may also partially explain this negative effect of CwE relative to credit-only groups.

Introduction

Single sector approaches to improving health often yield inadequate, short-term solutions (Oliveira-Cruz *et al.*, 2003; Waage *et al.*, 2010). Individual- or community-level health outcomes, for example, may be influenced by a number of complex and interrelated structural variables that need to be addressed simultaneously in order for health status to improve. Recently, there has been a shift toward cross-sectoral approaches that leverage and coordinate resources across multiple sectors to achieve measurable and sustainable change (Buse and Hawkes, 2015). The United Nation's post-2015 Sustainable Development Goals, for example, aim in part to address the continuously intertwined issues of extreme poverty and poor health (Sachs, 2015; United Nations General Assembly, 2015). However, successful strategies for accomplishing these goals are still being defined and tested.

One promising option is integrated microfinance and health (IMH) programs, which provide clients, typically women, with access to financial resources as well as health products and services. As of December 2013, over 211.1 million people worldwide had accessed microfinance services, 75% of whom were women (Reed, 2015). These individuals represent only a portion of the world's population that lack access to traditional banking services. Microfinance fills this gap and fosters financial inclusion by providing small amounts of credit, savings, insurance, payments, and other services for some of the world's poorest populations. The effectiveness of microfinance has been long-debated, with some experts claiming that there

is not enough credible evidence to substantiate claims that access to microfinance meaningfully reduces poverty (Armendariz and Morduch, 2010; Roodman and Morduch, 2014). However, other research suggests that microfinance does indeed have positive effects, though these impacts vary by type of financial service (Cull *et al.*, 2014). For example, a review of six randomized evaluations of microcredit reported that access to microcredit alone led to improvements in financial inclusion, business investment, and consumption-smoothing; yet, it did not result in increased income or improvements in health, education, and empowerment (Banerjee *et al.*, 2015). Savings, on the other hand, has demonstrated a more consistent positive impact. Access to and use of savings products has mitigated the effect of health shocks, increased food security and food expenditure for the family, and improved investments in preventative health care and business (Brune *et al.*, 2011; Dupas and Robinson, 2013a, 2013b). The evidence-base for insurance and payments is still growing, but these products have so far helped to improve agricultural yields as well as reduce food insecurity and use of negative coping mechanisms when household shocks occur (Cole *et al.*, 2013; Janzen and Carter, 2013; Karlan *et al.*, 2014).

More recently, researchers and program implementers have sought to increase the positive incremental effects achieved through microfinance alone by integrating these financial resources with health services and products. Together, microfinance and health may have the potential to improve household health and economic outcomes better than either intervention on its own (Karlan and Morduch, 2010). The rationale is rooted in the intrinsically linked relationship between poverty and ill-health. Research shows that poor health is a key reason why households remain trapped in poverty (Dodd and Munck, 2002), and conversely, socio-economic factors tend to be major fundamental causes of poor health-related outcomes (Link and Phelan, 1995). However, Link and Phelan posit that in order to understand health, it is essential to address its fundamental causes, not just proximate risk factors. Structural interventions, such as IMH programs, seek to do just that – improve health by addressing the

larger context in which health is produced (Blankenship *et al.*, 2006). Through the integration of microfinance and health, interventions are able to address issues with household economics, financial inclusion, and social networks that may have an impact on the health of the household.

Given the relationship between poverty and ill health, it behooves microfinance institutions (MFIs) to provide clients with additional resources that may assist them in achieving their financial goals. Although IMH programs operate differently by location, they typically: (1) build awareness and knowledge to better address health concerns; and/or (2) provide resources (i.e. financial, social, emotional) to take action in improving or maintaining their health status. Microfinance can be coupled with one or more of the following health components: health education and promotion; health financing and micro-insurance; direct or indirect linkages to health providers; or access to health-related products. There is promising evidence that IMH programs do have positive effects on health (Isangula, 2012; Leatherman *et al.*, 2012). A recent review of the evidence through 2015 found that combining microfinance with health education programs successfully improved health knowledge, attitudes, and in some cases behaviors, though health status was not notably affected (Lorenzetti, *forthcoming*). Evidence was weaker but optimistic for microfinance combined with other health components. Thus far, IMH programs have successfully: reduced HIV/AIDS risk (Kim *et al.*, 2007; Pronyk *et al.*, 2008b; Kim *et al.*, 2009; Spielberg *et al.*, 2013) and domestic violence (Pronyk *et al.*, 2006; Kim *et al.*, 2007, 2009); improved malaria knowledge and prevention behaviors (De La Cruz *et al.*, 2009b); increased uptake and utilization of insecticide-treated bednets (Tarozzi *et al.*, 2014b); improved breastfeeding behaviors (Flax *et al.*, 2014); increased health knowledge related to treatment-seeking behaviors for childhood illnesses (Hamad *et al.*, 2011); and improved child nutritional outcomes such as improved height-for-age, weight-for-age and body-mass-index for age (Marquis *et al.*, 2015b). Integrated savings and health programs have also found positive impacts, such as improved birth outcomes, decreased maternal depression (Tripathy *et al.*, 2010) and improved household food security (Gash and Odell, 2013).

Although IMH programs have demonstrated some positive effects on health outcomes, little is known about the impact of these programs on individual or household financial outcomes. For example, if borrowers are more knowledgeable and proactive in addressing their healthcare needs, this may result in fewer missed days of work due to illness and longer, more productive hours, which might translate into increased income. Families may also be able to save money instead of regularly diverting funds for costly urgent care. In order for IMH programs to be considered an effective intersectoral approach, it is important to understand the financial value-add or effect on household economic outcomes. As such, the aim of this study is to evaluate the effect of an integrated microfinance and health education program in Benin on revenue and profit for households with a business.

Methods

Setting & Data Source

This study uses data from a cluster randomized controlled trial (RCT) in Benin, a francophone West African country with a population of 10.8 million, of which approximately 47% live below the international poverty line (USD 1.25/day) (UNICEF, 2015; World Bank, 2015). Formal banking options are unavailable to much of the population, presenting microfinance institutions (MFIs) with an important opportunity to close this gap for underserved households. In 2014, it was estimated that less than 17% of the adult population in Benin, ages 15 and older, had a formal bank account (Demirgüç-Kunt *et al.*, 2015).

Promotion et l'Appui au Développement de Micro-Entreprises (PADME) is one of the largest MFIs in Benin with a gross lending portfolio of CFA 26,089,692,000 (USD 43,885,800) and more than 32,000 active clients (PADME Benin, 2015). With the support of Freedom from Hunger, a non-profit organization based in Davis, California, PADME created a new Credit with Education (CwE) product offering microfinance along with basic health education for clients.

The cluster RCT was designed to assess the impact of the integrated program on client health attitudes and knowledge.

Credit with Education (CwE) Program

The CwE program provided group-based savings and loans combined with a 10-week health education program to women-only or mixed-gender groups in specified communities within PADME's network. MFIs commonly require group enrollment in the absence of personal collateral. In this way, the responsibility of repayment falls to the group, and social capital is leveraged to ensure that each member pays their share or risk being removed from the group (Ito, 2003). Groups were comprised of at least four members of different households; individuals had to be at least 16 years of age and capable of conducting a business activity. Within each group, individuals applied for loans appropriate to their needs. Individual loans did not exceed the equivalent of USD 50 for the first loan and had to be repaid within 16 weeks. In addition to basic business training, CwE groups received 10 weeks of health education provided by a trained loan officer on a variety of health topics, including: signs and symptoms of child illness, HIV/AIDS, malaria, and improving self-confidence in decision-making.

Study Sample

In total, 116 PADME communities in Benin's plateau region were randomized to one of four groups: (1) women receiving only credit; (2) mixed gender groups receiving only credit; (3) women receiving Credit with Education (CwE); and (4) mixed gender groups receiving CwE. At baseline, 43 villages were sampled; however, this was expanded to 73 additional communities at follow-up, totaling 116 clusters. See Figure 4.1 for details on clusters per study group. The study consisted of two cross-sectional household surveys, with baseline collected in 2007 and endline following in 2009. At baseline, approximately 30 PADME clients in each of the 43 communities were randomly sampled to participate in the survey. Roughly ten percent of respondents at

baseline were men, who were subsequently excluded from this analysis. Similarly, at endline, approximately 30 respondents were sampled in each of the 116 communities; however, this new, larger sample of respondents also included non-clients. All respondents were women, and PADME clients represented approximately 30% of endline respondents.

For the purposes of this analysis, we utilized the women-only baseline sample of 991 respondents in 43 clusters. In order to evaluate the effect of the program on PADME clients, we excluded all non-clients at follow-up, which reduced the sample size to 1093 respondents. Certain villages at follow-up did not have any PADME respondents; therefore, the number of clusters in the second time period decreased slightly from 116 to 109. The four study arms were collapsed into two groups: those receiving CwE and those receiving credit-only, regardless of the composition of group members. As shown in Figure 4.1, the groups used in this analysis were balanced in terms of sample size and clusters.

Key Variables

The key dependent variables were PADME clients' reported business revenue and profit earned in the past seven days. These were continuous variable reported in local currency (CFA); however, for the purposes of this analysis, we converted CFA to USD using an average annual exchange rate of CFA 474 to USD 1 between 2007 and 2009. There were missing values for both revenue and profit stemming from a survey skip pattern. Specifically, respondents were first asked if they were engaged in an income generating activity. If they responded 'No', they skipped over the questions on profit and revenue, and their response was marked as missing. Since they were not engaged in any income generating activity, missing responses were recoded as 0 for both revenue and profit for the purposes of this analysis. Finally, to compare trends in CwE and credit-only villages, we created indicator variables representing whether the household was a CwE participant in the follow-up period.

Analysis

To assess the effect of the CwE program on clients' reported revenue and profit, we conducted a difference-in-differences (DID) analysis at the cluster-level. This approach measures the change in means between credit-only and CwE groups, while controlling for unobservable differences in group characteristics at baseline as well as changes in dependent variables over time. DID is subject to the assumption that trends in key outcomes would be the same in intervention and control groups in the absence of the program. The randomization of villages at baseline helps balance groups and reduce the likelihood that trends in outcomes would differ between the two groups. To the best of our knowledge, there were no concurrent programs or events occurring in the region during the study period that may have affected the outcomes of interest differently by group.

We first conducted the DID using an ordinary least squares (OLS) model. However, given the right-skew distribution of the dependent variables, we also included an analysis using a generalized linear model (GLM) with a log link and gamma distribution. This model treats the dependent variables as logged transformations and does not drop out the large number of zeros from the analysis. The gamma distribution was considered appropriate given the continuous, right-skew dependent variables with values 0 and greater. All analyses included clustered standard errors at the village level.

Results

General Characteristics

As shown in Table 4.1, credit-only and CwE groups had similar characteristics at baseline. Average age of respondents was 35 years in both groups. Roughly half of respondents in credit-only and CwE groups were in monogamous relationships (50.9% and 52.1%, respectively), with the second largest portion of each group being in polygamous relationships (38.2% and 33.8%). In both groups, the vast majority were uneducated (86.1% and 84.0%), with

only 9.7% and 8.0% reported as literate in credit-only and CwE groups, respectively. In terms of religious make-up, both groups were predominantly Christian, followed by Muslim and traditional African religions.

Average Treatment on the Treated

We conducted an analysis of the average treatment on the treated to better isolate the effect of the program on actual participants. First, we evaluated program effect using an OLS model clustered at the village level (Table 4.2 below). Although these results suggested an overall negative effect of participating in the integrated program relative to the credit-only program, the results were not statistically significant for either outcome variable. Specifically, CwE program participants experienced an average decrease in revenue of USD 20 ($p=0.07$) relative to credit-only participants. CwE participation was also associated with an insignificant average decrease in profit of USD 3 ($p=0.32$) compared to credit-only participants.

Next, we explored program effect using GLM with clustered standard errors. The coefficients and average marginal effects are reported in Table 4.3 below. This model suggests that participating in the program does have a negative effect on revenue that is approaching significance. Specifically, participating in the CwE program was associated with an average decrease of USD 18 in revenue ($p=0.052$) relative to those in the credit-only program. The program did not appear to have an effect on profit, however. Participating in CwE was associated with an average decrease of USD 2 compared to those in the credit-only group, though this effect was not statistically significant ($p=0.41$).

The OLS and GLM models generated similar average marginal effects, though the levels of significance differed. Both models suggest a negative program effect for those participating in the CwE program, but this effect is only significant for revenue in the GLM model. The GLM model seemed to be a better fit based on the distribution of the data; however, we also tested goodness of fit between the two models by comparing the Akaike Information Criterion (AIC). A

lower AIC suggests better model fit. In order to generate AIC for the OLS model, we ran a GLM with an identity link and Gaussian family, which is functionally the same as OLS. The AIC was lower for the GLM model (23.8 vs. 21.5), suggesting better model fit.

Discussion

There is broad support for cross-sectoral development strategies, particularly for integrating microfinance with health-related services and products. However, in order to support the integration of these two sectors, it is crucial that we understand both the health and financial implications of bundling these services. Many studies have demonstrated that participating in an integrated microfinance and health education program can lead to gains in health knowledge and attitudes as well as some positive behavior changes. However, the effect on household economic outcomes is not well-understood. Without this information, we are challenged to understand the value-add of integrated microfinance and health programs as well as the relationship between health impacts and income effects. This analysis suggests that participating in PADME's integrated microfinance and health education program resulted in a decrease in both revenue and profit relative to participating in credit-only groups, though the effect on profit was not statistically significant. Nevertheless, these negative outcomes may challenge the theory that integrated programs can also improve a client's financial wellbeing.

There are a few plausible explanations for the negative effects of participating in the CwE program. A weaker potential explanation is that those participating in CwE are spending more time in any given week on health-related activities, which limits the time spent on their business endeavor. However, this would likely need to be substantial amounts of time in order to result in a significant negative effect on finances. Another possibility deals with reporting, suggesting that clients may co-mingle business-related finances with household expenses. Although PADME does offer some business training to all new clients, some may not accurately record business revenue and profit separately from other household expenses. For instance, a woman selling

products in the market may not differentiate between the income she earns from her own business venture and the amount she spends on her family in the market on any given day. In this case, the reduction in revenue and profit could be an indicator that CwE participants are making financial trade-offs. Specifically, those who receive health education may be more inclined to spend money on health-related products and services for their family. Literature suggests that exposure to health education can actually increase health spending. Unfortunately, we could not explore this hypothesis in our dataset due to the very small sample size of those responding to questions on health expenditures, which were only asked if the respondent sought medical treatment for their child.

The trade-off on health may not be the only type of trade-off CwE participants experience. These participants may also opt to divert earnings to savings accounts, *tontines* (a type of rotating group-saving mechanism), loans, or other mechanisms to help smooth consumption and protect against future high-cost illnesses. If true, this behavior could be an indicator that CwE participants have a different type of financial acumen that values the longer-term financial security of the household. Response rates were quite low for questions on savings accounts; however, we did examine the endline-only between-group responses for those reporting that they had ever participated in a tontine. At endline, slightly more PADME respondents in the credit-only group had participated in a tontine relative to CwE respondents, though the mean group difference was not statistically significant ($p=0.35$). On the other hand, at endline, more respondents in CwE villages reported having one or more loan than credit-only respondents, which was a significant group difference ($p=0.03$). Taken together, these figures suggest that PADME clients are indeed making other financial trade-offs for longer-term health and financial security. However, more research is necessary to understand if and how these trade-offs differentially effect CwE participants.

There may be another type of trade-off to consider: client comprehension and recall. By combining information on business and health, an integrated intervention asks participants to

take on a substantial amount of novel information in a relatively short period of time. We could speculate that people who are asked to focus only on the business aspect may be more successful in increasing their household financial outcomes than those who are asked to focus on business as well as the health of the family, including signs and symptoms of childhood illnesses, prevention of malaria, etc. Research has indeed shown that microcredit groups receiving business and financial education have experienced improvements in business practices and outcomes (Karlan and Valdivia, 2011; Drexler *et al.*, 2014), but there is a dearth of evidence on how this translates when other types of training are incorporated. The aforementioned assumption may be unfair given that women tend to be focused on the health of the family already. However, given the low levels of education in these communities, there could be some level after which participants do not retain new and complex information. It is important to understand participants' mental bandwidth, their capacity to meaningfully absorb and use different types of information, and how such knowledge may affect health and business decision-making (Mullainathan and Shafir, 2013).

Finally, as with most research concerning microfinance, we must consider the implications of self-selection. The cross-sectional cluster-randomized design helps balance and eliminate biases across groups and over time for the study sample; however, respondents were not randomized to actually participate in the intervention. Baseline respondents were PADME clients in randomly assigned study villages, meaning those participants may be fundamentally different from members of the same village who did not participate in microfinance. Furthermore, at endline, only 30% of the overall sample were PADME clients, indicating that roughly 2/3 of the endline sample opted not to participate in the product offered in their corresponding village. It could be that those who opted into the CwE program were more actively interested in the health component of the intervention and were less motivated by the microfinance aspect. Researchers have consistently noted that microfinance participants may differ in various ways to non-participants in the same communities. In our study sample,

however, groups were well-balanced on sociodemographic variables. This condition was also true when examining characteristics of PADME clients versus non-clients at endline or even PADME clients across the four original products. The key differences may therefore be in unobservable characteristics, such as a woman's level of empowerment.

Empowerment and IMH programs

What it means to be empowered varies by cultural context, but it generally expresses a change in a person's ability to make autonomous decisions when previously they could not (Malhotra and Schuler, 2005). Empowerment is often cited as a driver of success in structural interventions, including IMH programs, because participants must exercise certain dimensions of empowerment, such as self-efficacy and capacity to make their own decisions, in order for the intervention to yield meaningful change. For example, if a woman participates in microfinance and health, but her husband makes all the household decisions, including how she spends microfinance funds and when she can bring her children to the health center, the knowledge she gains may not translate into a behavior change. The effects of the program may be attenuated in this case. Empowerment may well moderate the effect of the integrated microfinance and health program. In our sample at endline, for example, the women-only groups reported lower average revenue and profit than the mixed-gender groups for both CwE and credit-only products. One could theorize that participants in women-only groups would feel more empowered because their voice and decision-making ability would not be diminished by male members and because of the trust and self-confidence that is built through women-only interactions. On the contrary, women in mixed-gender groups may feel more equal to men, improving their confidence and decision-making ability. Or, women in mixed-gender groups may have greater support from their husbands, strengthening their ability to navigate decisions for starting and growing businesses (Mayoux, 2001; Kantor, 2002).

Research on how gender dynamics interact with health outcomes found that involvement by both men and women in nutritional education was critical for achieving improved household nutrition (Vlassoff, 2007). Similarly, male involvement in health decisions, due to their role as primary breadwinners, was also critical in how household members responded to behaviors associated with HIV/AIDS (Ditekemena *et al.*, 2012). Although women-only groups can have positive effects for the individuals, for the group, and for society as a whole, women-only (as well as male-only) groups can alternatively result in further isolating women from community involvement and leadership positions, resulting in reinforced traditional gender roles (Inglehart and Norris, 2003). In order to understand if and how empowerment mediates the effect of the program on household financial outcomes, it first needs to be conceptualized and measured in the Beninese context.

Limitations

There are limitations of note for this study. First, the dependent variables are subject to recall bias. Asking about client reported revenue and profit in the past seven days was meant to mitigate this issue; however, asking the question this way precludes those whose income is generated on a seasonal or monthly basis. For example, farmers or cattle herders may not have responded or had as precise a response as someone who sells weekly in a market. Overall, this may have led to underreporting of revenue and profits, though this would have been balanced across groups due to randomization. Future studies might try to use a more objective measure of annual income. Studies might also attempt to use administrative data from the MFI to confirm client responses. Second, the cross-sectional nature of the study does not allow us to evaluate the effect of the program at the individual-level. A community census was intended to allow researchers to identify the households that participated at baseline and follow-up, but the census was not completed as planned. Third, although there were two years between baseline and follow-up, the intervention period may not have been long enough to fully evaluate a change

in revenue and profit, as education must first translate into knowledge, then to behavior change before finally generating the changes we sought to measure. It may be useful to look for a change in revenue and profit over a more extended period of time.

Conclusions

In this study, participating in CwE does not have positive financial implications. Data limitations constrain our ability to draw firm conclusions, but if more rigorous future studies echo these results, we will need to consider whether potential health gains are significant enough to outweigh the losses to household income. However, if the loss in revenue and profit is a reflection of a redistribution in household wealth to other mechanisms that help smooth consumption and protect against future costs of care, this could actually be a promising finding. There are myriad opportunities for future research to better understand the distinct as well as synergistic effects of microfinance and health interventions. Namely, future studies should focus on capturing health expenditures, including spending on routine care, curative care, and health-related products. Studies should also try to more closely capture finances at the household level, including all savings accounts, tontines, and formal or informal loans that contribute to the household's overall finances. Investigators might also leverage administrative data from MFIs to confirm client reported data when possible. We could also use qualitative data to elucidate the decision-making processes and trade-offs participants are confronted with as they join such groups. Finally, research should strive to better understand the unobservable characteristics, such as empowerment, that may drive success in integrated interventions. Although integrated microfinance and health programs have been widely embraced, their effectiveness may be one-sided. If we believe there is a value-add with cross sectoral approaches, we need to generate better proof that these programs are having the desired effect and to understand conceptually how changes in one sector impact the other.

Figures & Tables

Figure 4.1 Study Groups

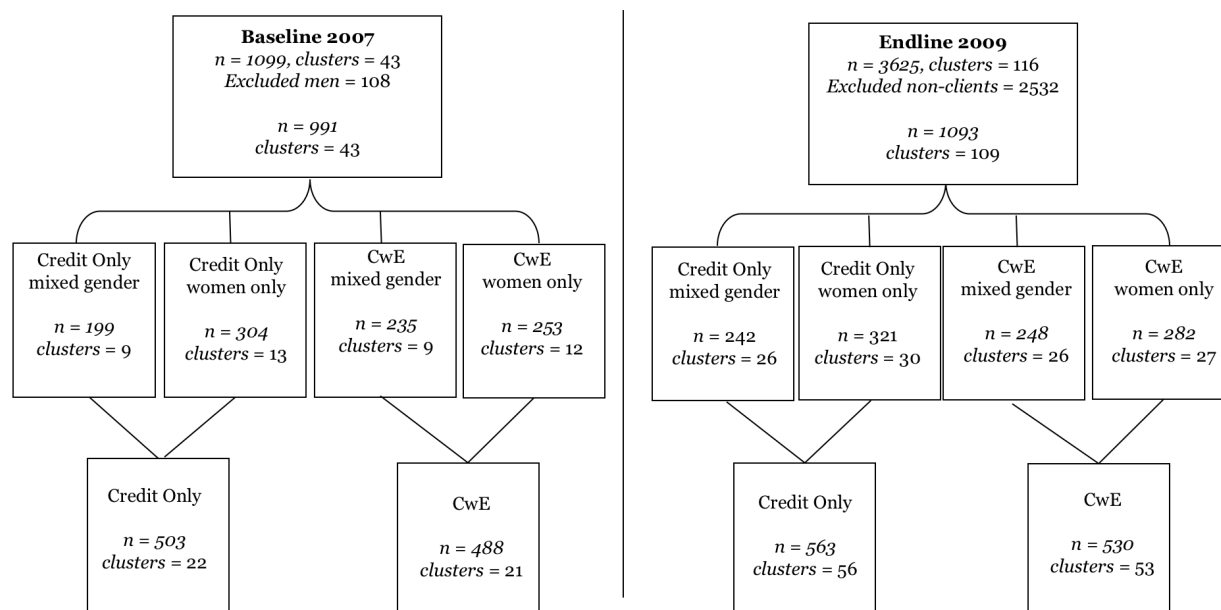


Table 4.1 Summary Statistics

	Baseline - 2007			Endline - 2009		
	Credit Only	Credit with Education	Total	Credit Only	Credit with Education	Total
n	503	488	991	563	530	1093
Age	35	35.4	35.2	31.8	32.0	31.1
Marital Status						
Monogamous	50.9%	52.1%	51.5%	46.9%	54.3%	50.5%
Polygamous	38.2%	33.8%	36.0%	50.4%	45.1%	47.9%
Widowed	6.2%	6.8%	6.5%	1.2%	-	0.6%
Single	0.6%	2.5%	1.5%	-	-	0.0%
Free union	0.6%	0.4%	0.5%	0.2%	0.2%	0.2%
Separated/divorced	1.2%	2.5%	1.8%	1.2%	0.4%	0.6%
No response	2.4%	2.1%	2.2%	0.4%	-	0.2%
Highest level of education						
No education	86.1%	84.0%	85.1%	85.1%	87.2%	86.1%
Kindergarten	1.0%	0.8%	0.9%	0.9%	0.2%	0.6%
Primary school	11.1%	11.9%	11.5%	10.5%	8.9%	9.7%
Secondary or higher	1.2%	2.7%	1.9%	2.9%	3.4%	3.1%
No response	0.6%	0.6%	0.6%	0.7%	0.4%	0.6%
Able to read	9.7%	8.0%	8.9%	12.3%	12.3%	12.3%
Religion						
Christian	65.6%	58.2%	62.0%	73.0%	66.4%	69.8%
Muslim	21.1%	28.1%	24.5%	18.3%	23.4%	20.8%
Traditional African	11.5%	11.3%	11.4%	6.2%	8.1%	7.1%
Other	1.0%	1.2%	1.1%	0.4%	0.8%	0.6%
No religion	0.8%	1.2%	1.0%	1.8%	0.9%	1.4%
No response				0.4%	0.4%	0.4%
Revenue in past 7 days (CFA)	18541	25478	21957	15203	12862	14068
Revenue in past 7 days (USD)	\$39.10	\$53.73	\$46.31	\$32.06	\$27.13	\$29.67
Profit in past 7 days (CFA)	3703	5635	4654	3058	3539	3291
Profit in past 7 days (USD)	\$7.81	\$11.88	\$9.82	\$6.45	\$7.46	\$6.94

Table 4.2 Effect of Credit with Education Program on Revenue and Profit - OLS

	Revenue (USD)	<i>p</i>	Profit (USD)	<i>p</i>
2009	-6.96	0.17	-1.34	0.11
CwE	14.79	0.15	4.11	0.16
Program Effect	-19.73	0.07	-3.10	0.32
<i>n</i> =	2084		2084	

Table 4.3 Effect of Credit with Education Program on Revenue and Profit – GLM

	Revenue		Profit	
	Result	<i>p</i>	Result	<i>p</i>
<i>Coefficients</i>				
2009	-0.20	0.15	-0.19	0.09
CwE	0.32	0.12	0.42	0.10
Program Effect	-0.49	0.04	-0.27	0.37
<i>n</i> =	2084		2084	
<i>Average marginal effect (USD)</i>				
2009	-7.46	0.21	-1.59	0.10
CwE	11.95	0.14	3.49	0.13
Program Effect	-18.23	0.052	-2.28	0.41

CHAPTER 5. DOES WOMEN'S EMPOWERMENT MATTER? AN ASSESSMENT OF HOW LEVEL OF EMPOWERMENT INFLUENCES PROGRAM EFFECT

Overview

Introduction: Empowering women may expedite development since women tend to invest in goods and services and make decisions that improve the well-being of the family. Economic development strategies may need to be coupled with policies and interventions that directly favor women in order to achieve lasting equality and greater health outcomes. Integrated microfinance and health is one type of economic development strategy largely focused on women. However, empowerment operates at various levels and may be a necessary input or mediator of large structural interventions, such as integrated microfinance and health programs. We assessed how program effect was influenced by women's level of empowerment.

Methods: We used data from a cluster randomized controlled trial in Benin. Microfinance villages were randomized to receive credit-only or Credit with Education (CwE), which integrated credit and a 10-week health education program. We conducted a difference-in-differences analysis, comparing trends in client reported revenue and profit between credit-only and CwE villages. We used confirmatory factor analysis to create a measure of empowerment with acceptable goodness of fit measures. We interacted the empowerment measure with the program effect variable to assess how the intervention affected revenue and profit as empowerment levels changed.

Results: Empowerment had a strong positive association with revenue ($p < 0.000$) and profit ($p = 0.001$). When interacted with the program effect variable, there were mixed effects. In the full sample, for continuous empowerment, CwE participants with a medium empowerment

score of 0 a reported a significant decrease in revenue relative to credit-only participants. CwE with a low empowerment score (-0.5) reported significantly less profit than controls. For empowerment terciles, CwE participants in the lowest empowerment group reported significantly less revenue than controls. Average village-level baseline empowerment did not have an effect on profit or revenue.

Discussion: The CwE program had an overall negative effect on revenue and null effect on profit. We expected participants at lower levels of empowerment to have even greater reported decreases than those at higher levels of empowerment. There was some evidence to support this in the full sample, though not when examining average baseline level of empowerment. Future research should apply more robust measures of empowerment and design studies that capture individual level empowerment at both time points.

Introduction

Why empower women?

Women's empowerment has become a more prominent feature of the global development agenda, particularly since 2000 when countries committed to the Millennium Development Goals (MDG). Laudable progress was made toward achieving the third MDG, promoting gender equality and empowering women. For example, five of nine regions achieved gender parity in primary education and the percentage of women in non-agriculture waged employment increased (United Nations, 2015). However, large gender disparities persist, with women more likely than men to live in poverty, face discrimination in the labor market, and be excluded from decision-making (United Nations, 2015). The important work of empowering women is carried forward in the post-2015 Sustainable Development Goals (Goal 5) (United Nations General Assembly, 2015) – and for good reason. First, working toward gender equity and ensuring the basic rights of women and girls is a moral responsibility. Second, empowering

women may actually expedite development since women tend to invest in goods and services and make decisions that improve the overall well-being of the family (Duflo, 2012).

Interventions that actively promote and remove barriers to gender equality have had positive effects on a variety of outcomes including: health knowledge, behaviors, and status; participation in household and sexual decision-making; and women's self-efficacy (Muralidharan *et al.*, 2014). A 2016 review exploring the effects of promoting gender equality and empowerment reported numerous positive effects across a variety of health and development outcomes. Taukobong and colleagues reported improvements in maternal, newborn, and child health; contraceptive use and timing and spacing of pregnancies; nutritional status and decreased stunting in children; menstrual hygiene management and WASH outcomes; women's agricultural productivity; and savings and business investment (Taukobong *et al.*, 2016). In addition to investing in education, promoting joint decision-making and equitable control over income or assets were noted to be the more effective strategies in improving health and development outcomes (Taukobong *et al.*, 2016).

Indeed, there is substantial evidence to support that empowering women leads to improved health and development outcomes both for the individual and her family. The reverse may also be true – development interventions, particularly those with an economic focus, may have an empowering effect on women. Duflo describes this complex, bi-directional relationship between economic development and empowerment. Economic development may lift women up by increasing household resources to reduce the vulnerability of women, providing a change in the nature of jobs available to women, or freeing up time for more productive endeavors (Duflo, 2012). However, empowerment is not a passive process, and Duflo argues that focusing on economic development alone is insufficient to achieving empowerment on a broader scale. Economic development strategies may need to be coupled with policies and interventions that favor women over men in order to achieve lasting equality, autonomy, and greater health outcomes (Duflo, 2012).

Empowerment and Microfinance

Microfinance is a well-established platform that provides some of the world's poorest populations with credit, savings, insurance, and other services that they are unable to access through formal banking institutions. Microfinance is delivered through microfinance institutions (MFIs), self-help groups, saving groups, and other community organizations that, by design, provide an opportunity for greater financial inclusion as well as participation and voice of women in their local affairs. Although microfinance is available to both men and women, it has historically focused on women, particularly since the 1980s with Dr. Muhammad Yunus' Grameen Bank in Bangladesh and after the Nairobi International Women's Conference in 1985 (Mayoux, 1999; Armendariz and Morduch, 2010). As of December 2013, of the 211.1 million people worldwide who had accessed microfinance services, 75% were women (Reed, 2015).

There are several explanations for the rise of women in microfinance. One advantage may be for the MFI more directly, as women tend to be more more reliable borrowers. A global analysis of women in microfinance, including data from 350 MFIs, found that having a greater percentage of female borrowers was significantly associated with a reduced portfolio risk and fewer write-offs (D'Espallier *et al.*, 2011). Some experts suggest that although there is limited evidence to support microfinance as a meaningful poverty reduction strategy, whatever benefits have been achieved may be contributed to the focus on women (Morduch, 1999). Advantages to the MFI may indeed have driven the rise of women in microfinance; however, considerable progress has been made under the mantle of social inclusion and gender equality (Mayoux, 1999; D'Espallier *et al.*, 2013). Mayoux suggests that the focus on women is in reality the convergence of three distinct paradigms: financial sustainability, poverty alleviation, and feminist empowerment. Although approaching the issue from three distinct ideologies, all arrive at the general consensus that involving women in microfinance leads to "virtuous spirals" of increasing (1) economic empowerment, (2) well-being, and (2) social, political, and legal empowerment (Mayoux, 1999).

In a sense, empowering women is inherent to microfinance. However, microfinance has been bundled with other services, such as health or gender interventions, to explicitly address the individual- or community-level barriers to reducing poverty that confront women. Experts suggest that synergy of approaches, particularly microfinance and health, may help achieve greater outcomes than either intervention on its own (Karlan and Morduch, 2010). When interventions that actively foster or support gender equity are layered on to IMH, these programs may be better equipped to intervene and dismantle barriers that limit opportunities for women in both microfinance and health. These may also represent the types of complex interventions Duflo suggested are necessary to achieve long-term, sustained economic growth for women and communities at large.

A preeminent example of an empowerment-focused microfinance intervention is the Intervention with Microfinance for AIDS and Gender Equity (IMAGE) study from South Africa, which provided microfinance activities with comprehensive HIV and gender education. The gender component involved participatory learning and community engagement on gender roles, cultural beliefs, domestic violence, and other pertinent topics. Those participating in the intervention experienced a 55% (CI = 0.23, 0.91) reduction in intimate partner violence (IPV) relative to non-participants and improvements across all 9 indicators of empowerment (i.e. self-confidence, autonomy in decision-making, perceived contribution to household finances) (Pronyk *et al.*, 2006; Kim *et al.*, 2007). Pronyk and colleagues also found that social capital, or networks individuals can tap into to address common concerns such as gender equality and inclusion, also increased for intervention groups though not significantly more than control groups (Pronyk *et al.*, 2008a). Health also improved as a result of the intervention, with participants reporting reduced HIV risk behaviors and improved HIV-related communication relative to the control group (Pronyk *et al.*, 2008b).

Pragati and Sonagachi in India also provided examples of complex structural interventions combining microfinance, health, and empowerment strategies (Swendeman *et al.*,

2009; Euser *et al.*, 2012; Souverein *et al.*, 2013). In Pragati, female sex workers (FSW) were provided with a tailored package of STI risk reduction, de-addiction, and microfinance services, all within a framework that identified and sought to address the personal and external factors that disempower women. The STI rate decreased while reported condom use at last unpaid sex increased (4-year trends $p < 0.001$). Sonagachi followed a similar design, incorporating peer educators, condom social marketing, microfinance, community organizing, and rights-based framing to reduce HIV/STI risk in FSW. This intervention successfully improved knowledge of STIs, increased condom decision-making, improved social support, and reduced economic vulnerabilities by increasing savings and alternative incomes for FSW (Swendeman *et al.*, 2009).

Conceptualizing Empowerment

IMAGE, Pragati, and Sonagachi are examples of complex microfinance and health interventions that consider empowerment to be an input, a process, and outcome. This highlights the dynamic and therefore challenging-to-measure nature of empowerment in development research. Experts across various disciplines have worked to conceptualize and operationalize empowerment. Despite ongoing deliberation on how best to measure empowerment, particularly given that it varies across cultural context, there is a general consensus on a definition. This research applies Kabeer's definition of empowerment, which is expressed as gaining the ability to make decisions for one's life choices when previously this ability was not available to them (Kabeer, 2001). Kabeer's definition contains two main ideas: agency and process. Agency refers not only to the ability to create goals and act on them but also to one's motivations for doing so. Process refers to a change from a position of disempowerment to empowerment, typically through exercising agency and increasing one's self-efficacy and independence. This definition, however, lends itself to interpretation in measurement. For example, many studies have utilized decision-making ability as a proxy for empowerment given

that the definition emphasizes the ability to choose (Hogan *et al.*, 1999; Abada and Tenkorang, 2012; OlaOlorun and Hindin, 2014). However, Malhotra (2002) determined there to be six domains of empowerment commonly used in the literature: economic, socio-cultural, familial/personal, legal, political, and psychological (Malhotra *et al.*, 2002).

This research seeks to create a contextually relevant measure of empowerment and apply that measure to better understand the relationship between microfinance, health, and empowerment. The abovementioned research has demonstrated that IMH programs have improved certain indicators or proxies of empowerment; however, the literature does not explore how being empowered may effect performance in a microfinance and health program. We would expect those who are already at a higher level of empowerment may perform better than those who are less empowered. If true, it may be beneficial for MFIs to identify less empowered individuals before they apply for credit and offer a tailored package of support services that improves their ability to earn and save. In this study, we evaluated (1) if empowerment was associated with increased revenue and profit for IMH clients in Benin; and (2) how the effect of the program differed for empowered women relative to less empowered women.

Methods

Setting & Data Source

This study uses data from a cluster randomized controlled trial (RCT) in Benin, a francophone West African country with a population of 10.8 million, of which approximately 47% live below the international poverty line (USD 1.25/day) (UNICEF, 2015; World Bank, 2015). Formal banking options are unavailable to much of the population, presenting microfinance institutions (MFIs) with an important opportunity to close this gap for underserved households. In 2014, it was estimated that less than 17 percent of the adult population in Benin, ages 15 and older, had a formal bank account (Demirgüç-Kunt *et al.*, 2015).

Promotion et l'Appui au Développement de Micro-Entreprises (PADME) is one of the largest MFIs in Benin with a gross lending portfolio of CFA 26,089,692,000 (USD 43,885,800) and more than 32,000 active clients (PADME Benin, 2015). With the support of Freedom from Hunger, a non-profit organization based in Davis, California, PADME created a new Credit with Education (CwE) product offering microfinance along with basic health education for clients. The cluster RCT was designed to assess the impact of the integrated program on client health attitudes and knowledge.

Credit with Education (CwE) Program

The CwE program provided group-based savings and loans combined with a 10-week health education program to women-only or mixed-gender groups in specified communities within PADME's network. MFIs commonly require group enrollment in the absence of personal collateral. In this way, the responsibility of repayment falls on the group, and social capital is leveraged to ensure that each member pays their share or risk being removed from the group (Ito, 2003). Groups were comprised of at least four members of different households; individuals had to be at least 16 years of age and capable of conducting a business activity. Within each group, individuals applied for loans appropriate to their needs. Individual loans did not exceed the equivalent of USD 50 for the first loan and had to be repaid within 16 weeks. In addition to basic business training, CwE groups received 10 weeks of health education provided by a trained loan officer on a variety of health topics, including: signs and symptoms of child illness, HIV/AIDS, malaria, and improving self-confidence in decision-making.

Study Sample

In total, 116 PADME communities in Benin's plateau region were randomized to one of four groups: (1) women receiving only credit; (2) mixed gender groups receiving only credit; (3) women receiving Credit with Education (CwE); and (4) mixed gender groups receiving CwE. At

baseline, 43 villages were sampled; however, this was expanded to 73 additional communities at follow-up, totaling 116 clusters. See Figure 5.1 for details on clusters per study group. The study consisted of two cross-sectional household surveys, with baseline collected in 2007 and endline following in 2009. At baseline, approximately 30 PADME clients in each of the 43 communities were randomly sampled to participate in the survey. Similarly, at endline, approximately 30 respondents were sampled in each of the 116 communities; however, this new, larger sample of respondents also included non-clients. PADME clients represented approximately 30% of endline respondents.

For the purposes of this analysis, we utilized the full baseline sample of 1099 respondents in 43 clusters. In order to evaluate the effect of the program on PADME clients, we excluded all non-clients at follow-up, which reduced the sample size to 1093 respondents. Certain villages at follow-up did not have any PADME respondents; therefore, the number of clusters in the second time period decreased slightly from 116 to 109. The four study arms were collapsed into two groups: those receiving CwE and those receiving credit-only, regardless of the composition of group members. As shown in Figure 5.1, the groups used in this analysis were balanced in terms of sample size and clusters.

Key variables

The key dependent variables were PADME clients' reported business revenue and profit earned in the past seven days. These were continuous variable reported in local currency (CFA); however, for the purposes of this analysis, we converted CFA to USD using an average annual exchange rate of CFA 474 to USD 1 between 2007 and 2009. There were missing values for both revenue and profit stemming from a survey skip pattern. Specifically, respondents were first asked if they were engaged in an income generating activity. If they responded 'No', they skipped over the questions on profit and revenue, and their response was marked as missing. Since they were not engaged in any income generating activity, missing responses were recoded as 0 for

both revenue and profit for the purposes of this analysis. Finally, to compare trends in CwE and credit-only villages, we created indicator variables representing whether the household was a CwE participant in the follow-up period.

Empowerment was measured at the individual level, incorporating dimensions of empowerment as suggested by previous studies (Malhotra and Schuler, 2005; Do and Kurimoto, 2012). We used second order confirmatory factor analysis (CFA) to assess the factor structure of observed and latent variables measuring the empowerment construct. To do so, we first identified items from the household survey and grouped them into theorized dimensions of empowerment: economic, socio-cultural, inter-personal, legal, political, and psychological. We then evaluated if items in each domain were correlated, thereby creating sub-dimensions. Through an iterative process, items were evaluated as latent variables or as directly observed variables until an appropriate model was identified. Our model incorporates economic, socio-cultural, and inter-personal dimensions of empowerment.

The economic dimension was measured by one item asking about *women's contribution to household revenue* in the past year. Response options were (0) no revenue; (1) a small portion; (2) less than half; (3) half; (4) the majority; and (5) all. The socio-cultural dimension was measured by two latent variables: *freedom of movement* and *community leadership*. Freedom of movement was a four-item variable asking if women were able to go to the following places unaccompanied: the market, the health center, a friend's house, and a place of worship. Response options were (0) cannot go; (1) can go but not alone; (2) can go alone. The leadership latent variable was measured by three items: number of community groups in which the woman participates (count variable); if the woman had spoken at a community meeting in the past 12 months ([0] no, [1] yes); and if she has been a candidate or elected to a community post in the past 12 months ([0] no, [1] yes). The inter-personal dimension was measured by a 4-item *decision-making* variable. Respondents were asked about household decision-making power. Specifically, who decided on issues of: sending the children to school; community groups in

which children are allowed to participate; goods the family will buy or sell; and working outside the home or not. Response options were (0) husband only; (1) joint decision; and (2) the respondent.

We did not explore the legal dimension as the survey did not include items covering this topic. We initially aimed to explore the political dimension using items measuring how often the respondent votes in elections and if they have ever been elected to a community position. The voting item did not fit our model, and the election item was more strongly correlated with questions of community leadership. For the psychological dimension, we fit a latent variable measuring women's confidence in keeping their children healthy and achieving betterment for their families. Although the items supported a confidence variable, it did not fit in the overall empowerment model. See Table 5.1 for more information on variables that were identified and included in our model.

Our overall empowerment measure performed well in terms of goodness of fit, with an RMSEA of 0.048, CFI of 0.982, and TLI of 0.977. The factor estimates ranged in strength, though all were statistically significant (see Table 5.1). To verify the model, we tested it first in the baseline sample and again in the endline sample. Goodness of fit measures and factor loadings were similar across the two models.

Qualitative validation of empowerment measure

In June 2015, we conducted 15 in-depth interviews with women across four diverse geographic regions in Benin: Capital, Plateau (same region as survey data), Collines, and Alibori. Participants in each locale were purposively selected from three age ranges: 18-34, 35-49, and over 50 years. The goal of these interviews was to contextualize empowerment and the status of women in Benin. The questionnaire was modeled after various tools assessing women's status and incorporated questions touching on the six distinct dimensions of empowerment as identified by Malhotra and Schuler. The interview guide was translated into French and back

translated into English to ensure appropriate interpretation of questions and themes. Interviews were conducted in French and lasted between 45 and 60 minutes. Ethical approval for qualitative interviews was granted by the institutional review board of the University of North Carolina at Chapel Hill (15-1644).

Although these interviews were conducted after the cluster RCT was already completed and therefore could not directly inform the empowerment data collected, interviews provided important contextual information about the empowerment variable that was constructed for this analysis. For example, respondents reported that women in Benin take voting very seriously; therefore, almost all women reported voting on a regular basis. Since empowerment is a process of moving from a lower to higher level of ability to make strategic life choices, if all women are already exhibiting a certain trait, this would not be considered a good measure or predictor of empowerment. In the case of voting, it seemed reasonable that this variable did not fit in our model given the high level and limited variability of voting in our sample.

The interviews offered support for the dimensions included in our measure. Decision-making ability was a strong feature of each interview, with women describing a range of experiences concerning their ability to freely make decisions without the support of their partner. Important decisions, such as caring for sick children or sending children to school, typically fell to the husband. However, decisions related to traditional female roles, such as deciding what to make for meals, were not contentious. In fact, several respondents expressed that decision-making associated with the household fell squarely into the wife's domain. Some respondents also commented that although they experienced shared decision-making within their own household, the perception of women as decision-makers was not supported in the community at large.

“In Ketou, it is the husband that makes the decisions – always the men. You cannot manage decision-making. Your husband will refuse.”

- Ketou, age 32

“I don’t need permission. I take my kids to school, I take the kids to the hospital. If there’s a fire in the house, I don’t need permission to take them out. When it has to do with every day activities of the house, you don’t need permission for that.”

- Kandi, age 45

The discussion of freedom of movement within their own communities called into stark contrast the experience of women versus men. Fathers, husbands, and older brothers for single women were considered guardians of the family, and women were typically expected to ask permission before going most places, including health centers and the market. Men were not necessarily expected to accompany the women once permission was granted. Some women noted the subtler distinction between asking permission and informing their husband of their plans to leave the house. Some respondents noted that asking permission or informing their husband was more akin to a courtesy - it served to acknowledge their husband’s position as head of the household without actually expecting him to exercise his authority in that moment. There was also a sense that younger, unmarried women had the ability to move more freely, but this could become restricted once she was married, depending on the character or tradition of the man she married.

“Depends on the type of husband. There is a category of husband where the woman would never do anything without his permission. The other category – he just needs to know where she is. She doesn’t need to ask permission exactly.”

- Kandi, age 33

In terms of contributions to the household finances, there was a rift between the expectation and reality for women. Respondents noted that traditionally women should stay home and raise children; however, too often husbands were unable to provide for all the needs of the family. Women working was considered an obligation or the only feasible solution to ensure the family had all they needed, including a wider variety of nutritious foods for growing children. This was a particular challenge in polygamous households where a meager income was expected to be split between various partners. Although most women cited necessity as their reason for working outside the home, some women expressed financial freedom as another impetus for

finding work. With their own income, they were better able to provide for their children and did not need to rely on their husbands to make every decision, particularly as related to household needs. However, several women noted that working outside the home was in addition to household duties, increasing the burden on women to provide for the family, financially or otherwise.

“It’s not the same. Women can’t really work without permission of the husband, but they can find small jobs to make some extra money. Women decide to work for their kids. One person is not bringing enough money, but anything I bring in is for my kids.”

- Adourekoman, age 34

Women in Benin were actively involved in their communities. Respondents noted numerous groups to participate in, including: market, church/mosque, agricultural, street-cleaning, funeral, and income-generating and saving groups such as microfinance or tontines. Husbands were typically supportive of their wives’ participation in groups, and women considered groups to be important and community-strengthening. Women said they joined groups for moral support, friendship, personal betterment, and respect. When asked about what it meant to be a strong or influential woman, many women noted community-related aspects, such as being involved in groups, helping other women, and taking ownership of her own life.

“First, her social position. If she’s in a position of leadership, maybe politically, maybe involved in a group where she leads other women. She needs to be married to be influential. She needs to have a job that enables her to take care of her own needs.”

- Cotonou, age 55

In summary, the interviews provided important contextual information about empowerment in Benin that supports the latent and observed variables included in the empowerment measure.

Analysis

This analysis used a difference-in-differences model to assess the effect of the CwE program on clients’ reported revenue and profit at the cluster-level (Model 1). This approach

calculates program effect by comparing the change in mean revenue and profit between CwE and credit-only groups, while controlling for unobservable differences in groups at baseline as well as changes in dependent variables over time. Given the continuous, non-negative, right-skewed dependent variables, we used a generalized linear model (GLM) with a log link and gamma distribution. This model treats dependent variables as logged transformations while maintaining zeros in the analysis. All analyses included clustered standard errors at the village level.

We conducted several analyses in order to examine the role of women's empowerment in the the CwE program. We first created an empowerment measure using CFA described above. We then calculated a factor score for each individual in the dataset. We created a second model (Model R2, P2), which incorporated a continuous measure of empowerment as a control variable in the base model in order to examine the effect, if any, on revenue and profit. To facilitate deeper understanding of the empowerment measure, we also incorporated its component latent and observed variables in Tables 5.3 and 5.4 (i.e. decision-making, freedom of movement, community leadership, and household contribution).

We then created interaction terms between empowerment and the program effect variable to determine if program effect varied at different levels of empowerment for the entire sample. We first examined program effect with empowerment as a continuous variable. We then separated the factor scores into terciles of low, medium (or average), and high levels of empowerment. We examined the literature and determined that separating into three groups provides reasonable gradation of empowerment levels. However, we could not find literature suggesting appropriate methods for determining empowerment cutoff points. We then interacted the program effect variable with an indicator variable representing the three groups of empowerment.

In using the full sample, there were some concerns of endogeneity given that empowerment is conceptualized to be influential at different levels and along various pathways

in a complex intervention such as IMH. We therefore wanted to isolate empowerment at baseline and understand how being more or less empowered at the start of the intervention affected revenue and profit over time. Isolating empowerment at baseline was also intended to provide insight to the characteristics of high-performing women at the start of the intervention. Given the cross-sectional nature of the data, we could not explore individual baseline empowerment. Instead, we dropped all clusters that did not have respondents at both time points and examined average empowerment at the village level. We identified a mean empowerment score per village and applied terciles to the baseline-only empowerment measure. We then conducted the abovementioned analyses with continuous and tercile empowerment interacted with the program effect in the reduced sample. Finally, we calculated average marginal effects to facilitate interpretation of results; however, we did not calculate marginal effects for interaction terms but instead provide predictive values to explain the relationship. Graphs of predicted mean values and marginal effects are provided (Figures 5.2 – 5.9).

Results

Credit-only and CwE groups had similar characteristics at baseline. Average age of respondents was 35 years in both groups. Roughly half of respondents in credit-only and CwE groups were in monogamous relationships (50.9% and 52.1%, respectively), with the second largest portion of each group being in polygamous relationships (38.2% and 33.8%). In both groups, the vast majority were uneducated (86.1% and 84.0%), with only 9.7% and 8.0% reported as literate in credit-only and CwE groups, respectively. In terms of religious make-up, both groups were predominantly Christian, followed by Muslim and traditional African religions (see Table 5.2).

Our base models suggest there is no effect of the CwE program on profit; however, the effect of the CwE program on revenue was approaching significance, with participants reporting an average decrease of USD 18 in revenue ($p=.052$) compared to credit-only participants.

Empowerment, however, had a strong positive effect on both revenue and profit. Specifically, an increase in the empowerment factor score was associated with an average increase of USD 21 ($p < 0.000$) in revenue and USD 6 ($p = 0.001$) in profit controlling for all other factors. The individual components of the empowerment measure also demonstrated strong positive effects on revenue and profit. For example, the average marginal effect of decision-making, community leadership, and household contributions on revenue were all positive and statistically significant. Freedom of movement did not appear to effect revenue, although the overall program effect became statistically significant and negative when freedom of movement was incorporated in the model (R4). Empowerment and its component parts also demonstrated positive, statistically significant associations with profit. Based on these findings, we considered that empowerment may mediate the effect of the program; however, we would expect a mediating variable to absorb some of this effect. Instead, the average marginal effect of the program actually becomes more negative and statistically significant in Models R4 and R5. Nevertheless, Tables 5.3 and 5.4 suggest that empowerment may be conceptually important in this type of intervention.

Empowerment and program effects in the full sample

The interaction terms in Tables 5.6 and 5.7 explore how the program effect changes at different levels of empowerment for the entire sample. For the interaction between program effect and the continuous empowerment measure, coefficient estimates were not significant for revenue or profit. For revenue, we calculated the average marginal effect of being in the program when the empowerment score was -0.5 (low), 0 (medium), and 0.5 and 1 (high). Although average revenue was lower in CwE groups than credit-only groups across all empowerment scores, there was a general positive trend in predicted mean revenue as empowerment increased. However, CwE clients at a medium empowerment score ($=0$) experienced a greater average decrease in revenue than those in the credit-only group (Figure 5.2). Specifically, at an

empowerment score of 0, being in the CwE program was associated with a significant decrease in revenue of USD 15 ($p=.038$) compared with being in the credit-only group. In terms of profit, average marginal effect at various empowerment scores showed a general trend of profit increasing with empowerment score. However, at a low empowerment score (-0.5), CwE participants reported an average decrease of USD 3 in profit ($p=0.02$) than their credit-only counterparts (Figure 5.3).

Next, we examined program effect by terciles of empowerment on outcome variables for the full sample. The interaction had a significant effect on revenue. Specifically, although average revenue appeared to decrease for all CwE participants relative to credit-only participants (Figure 5.4), the effect was significant in the low empowerment group, where CwE participants had an average decrease of USD 14 ($p = .040$) compared with credit-only participants (Table 5.5). For profit, all empowerment terciles reported a decrease in profit relative to credit-only groups. Loss in profit was greatest in the lowest empowerment group and least in the highest empowerment group (Figure 5.5), but the average marginal effects between CwE and credit-only groups were not statistically significant at any empowerment level.

Empowerment at baseline

We limited the sample to examine the effect of average village empowerment at baseline. As shown in Tables 5.6 and 5.7, there was a positive but insignificant effect of average village level baseline empowerment score on revenue and profit. Interacting the program effect and continuous empowerment at baseline did not have a significant effect on revenue. We then calculated average program effect at when the empowerment score was -0.4 (low), 0 (medium), and 0.3 (high). At the lowest empowerment score, reported revenue in the CwE was actually higher than in the credit-only group, and this trend became more negative as the scores increased. However, these effects were not statistically significant at any empowerment score. With respect to profit, the regression coefficients suggest significant effects of the interaction terms. We then examined

average marginal program effect at varying levels of empowerment scores. Similar to revenue, the average marginal program effect on profit was not significant at the various levels of empowerment we tested. However, at a lower empowerment score, CwE participants reported a positive profit compared to credit-only participants (Figure 5.7).

Findings were similar in models examining empowerment by group. For revenue, CwE participants reported an increase in revenue relative to credit-only participants in the lowest empowerment group, while CwE participants reported losses compared to credit-only participants in medium and high empowerment groups (Figure 5.8). However, these findings were not statistically significant at any level. We again found similar results for profit. There were not significant marginal effects, but the lowest empowerment group reported relative gains, while the medium and high empowerment groups reported loss in profit on average (Figure 5.9).

Discussion

The literature lays a conceptual foundation for empowerment as a driver of participant success in complex, structural interventions such as the one examined here. Our analysis also provided some insight into how empowerment may operate in helping women achieve greater revenue and profit. Empowerment was positively and significantly associated with revenue and profit. In examining the domains of empowerment, we found that the ability to make decisions had a strong positive relationship with both outcome variables. This is perhaps unsurprising given that the definition of empowerment focuses on gaining the ability to make strategic life choices for oneself. Practically speaking, decision-making is central to the microfinance and health experience. If a woman is accessing credit but her husband controls when and how she conducts her business, she may be less motivated to put forth a genuine effort or she may be asked to make decisions that are not in her best interest. Successful participation in IMH programs entails translating information gained in lending and health education session into

strategic business and health-seeking behaviors through informed decision-making. Community leadership and contributing to the household finances were also significantly and positively related to profit and revenue. Freedom of movement, however, was associated with profit but not revenue. This suggests that women are able to earn even with limited mobility, which would be true for women who provide services directly from their homes (i.e. restaurant or boutiques). However, the ability to move freely throughout the community may influence the type of business endeavor and ability to make profit.

In examining empowerment within the CwE program, we found some significant average marginal effects that support the hypothesis that women with higher levels of empowerment are more successful in terms of earning revenue and profit. Without incorporating the empowerment measure, the CwE program resulted in negative effects on revenue and profit. The effect on revenue was approaching significance ($p = 0.052$), but the effect on profit was not significant. Given this finding, we might expect that even if a negative relationship holds true for program participants, less empowered women may make even less in revenue and profit than more empowered women. When we examined interaction effects in the full sample, we did find some evidence of this. Although reported revenue was negative, it became less negative as empowerment scores increased and was significantly lower than credit-only participants for those at a medium level of empowerment. The trend for profit also increased as empowerment increased, with a low empowerment score of -0.5 reporting significantly less profit on average than credit-only groups. When we examined by terciles, there was a significant negative program effect on revenue in the lowest empowerment group. However, there were no significant effects on profit at different group levels. These findings suggest that women with lower levels of empowerment may be at a greater disadvantage in a program such as CwE compared to those with higher levels of empowerment. As a group, CwE participants reported average losses in revenue and profit relative to credit-only participants; however, the full sample analysis suggested that women who are less able to exercise decision-making power or who

cannot move freely within their own community, for example, may reported even greater losses than their more empowered counterparts.

In order to test if being more empowered at the start of the intervention is predictive of being more successful, we examined effects based on baseline levels of empowerment. However, the findings when examining just those clusters with baseline empowerment scores did not support our findings from the full sample. In general, the findings when examining program effect by average village baseline empowerment were not significant. The trend in average program effect on profit and revenue actually appeared to decrease as average baseline empowerment score increased (Figures 5.6 & 5.7). This was echoed in the analysis by empowerment tercile at baseline. This was an unexpected albeit insignificant finding. One potential explanation is that women at higher levels of empowerment at baseline have more responsibilities or are otherwise engaged within the community and at home. This may detract from the time or resources they allot to their business endeavors compared with women in a lower empowerment group. Nevertheless, rather than concluding that baseline level of empowerment does not affect program success, this may instead elucidate a challenge in the way empowerment was measured for that analysis. At a specific value of empowerment, we were able to observe marginal effects on predicted mean values; however, on average, effects may become washed out. Empowerment certainly exists at an aggregate or community level; yet, the approach for measuring empowerment at the individual and community levels most certainly differs. There are concepts and themes that may be relevant at the community level that might not apply to the individual. In order to better explore the effect of empowerment at baseline, future research should aim to collect individual-level longitudinal data.

In general, the results of the CwE on reported profit and revenue were not promising. Despite the strength of the association between empowerment and revenue and profit, we did not find that empowerment played a strong role, except perhaps for those who are less empowered within the community. It may be that overall level of empowerment was low in these

communities, and limited variability in the measure hindered our ability to detect a meaningful change. Nevertheless, these results ask us to consider the value of integrating microfinance and health programs. Although some experts suggest that integrated approaches may provide synergistic effects, this analysis did not support that claim. Instead of increasing client financial outcomes, participating in CwE had a negative effect, which was true even when controlling for empowerment.

From a gender and empowerment perspective, although our analysis did not seek to examine if the program itself was empowering, it is worth noting that some experts have questioned whether microfinance is in fact an empowering process for women in certain contexts. In some cases, participating in microfinance has caused conflicts within families (Goetz and Gupta, 1996). For example, an analysis of cross-sectional data in Bangladesh suggested that being an educated and empowered woman involved in decision-making and microfinance was associated with greater odds of experiencing intimate partner violence (IPV) than for women not involved in microfinance (Dalal *et al.*, 2013). However, more robust research from a RCT in Cote d'Ivoire testing the effect of incorporating gender dialogue into a group savings intervention found that participating in savings and gender dialogue resulted in a decrease of reported economic abuse (OR = 0.39 [CI: 0.25, 0.60]) and a decrease in acceptance of wife beating ($p = 0.006$). Although physical and sexual IPV were observed, the difference was not statistically different from the control group (Gupta *et al.*, 2013). Other experts argue that microfinance diverts resources from strategies that may be more empowering for women (Ebdon, 1995; Mayoux, 1999). This raises concern for whether microfinance can meaningfully effect poverty alleviation for women (Rogaly, 1996). These challenges are worth considering in light of the negative effect of CwE program participation, as well as the fact that our empowerment measure did not play a stronger role in improving program effects.

Limitations

There are a few limitations to consider in this analysis. First, to create our measure of empowerment, we used a rigorous method that included CFA as well as a qualitative assessment of the measure. Nevertheless, we did not use an empowerment tool that has been tested as valid and reliable for constructing this measure. There may be some dimensions that relate to empowerment in the Beninese context but were not included in the survey dataset. For example, we were unable to measure legal empowerment as the survey did not measure this dimension. Also, our measure does not capture empowerment at various levels (i.e. individual versus community versus national). Future research should attempt to measure empowerment prospectively and incorporate the various steps necessary to ensuring the measure fits within the appropriate context. A second limitation is that the cluster-level analysis may have reduced our ability to meaningful measure empowerment at baseline. Our measure was designed at an individual level, and a village-level aggregated measure may need to measured differently to ensure accuracy. In general, the cross-sectional nature of the data does not allow us to evaluate program effect at the individual level. Another challenge was the measurement of the dependent variables. To mitigate the issue of recall bias, the survey question asked about revenue and profit within the past seven days. However, asking the question this way may preclude those whose income is generating on a monthly, seasonal, or annual basis (i.e. farmers). This may have contributed to underreporting of both revenue and profit. Future studies should work to include a more objective measure of revenue and profit.

Conclusions

There is theoretical foundation suggesting that empowerment as a key driver of success in complex structural interventions, such as PADME's CwE program. We would expect that women who are more empowered may have improved outcomes compared to their less empowered counterparts. In light of the program effects of CwE, we expected that even if

women reported decrease in revenue and profit relative to credit-only participants, the losses of empowered women would not be as substantial as those reported by less empowered women. Our analysis supports this to an extent, but ultimately provides weak evidence, particularly when examining empowerment levels before women even engage with the credit program. It may be that the CwE program is complex, including multiple components that ultimately detract from the program's main objective of providing financial growth and independence. This may hold true even for empowered women in this specific context. However, given the abovementioned limitations, we ultimately suggest that our analysis provides no evidence of synergy between the two sectors.

There are, however, promising opportunities for future research. First, as the field of empowerment measurement continues to progress, we anticipate that valid and reliable quantitative measures will emerge. Future research should apply these measures and, more importantly, design studies that capture individual-level empowerment at various time points. Even with valid measures of empowerment, it may be important to supplement with qualitative data to further understand how empowerment operates within a microfinance and health program. Integrated microfinance and health programs continue to be delivered throughout low- and middle-income countries, and it is important that researchers and practitioners understand the full implications of these interventions. If social products ultimately dilute their financial effectiveness, programs may need to be re-designed to better serve clients. In addition, understanding how empowerment operates within a microfinance and health program will aid MFIs and other groups understand the types of tailored services that may be necessary to support different types of clients.

Figures and Tables

Figure 5.1 Study Groups

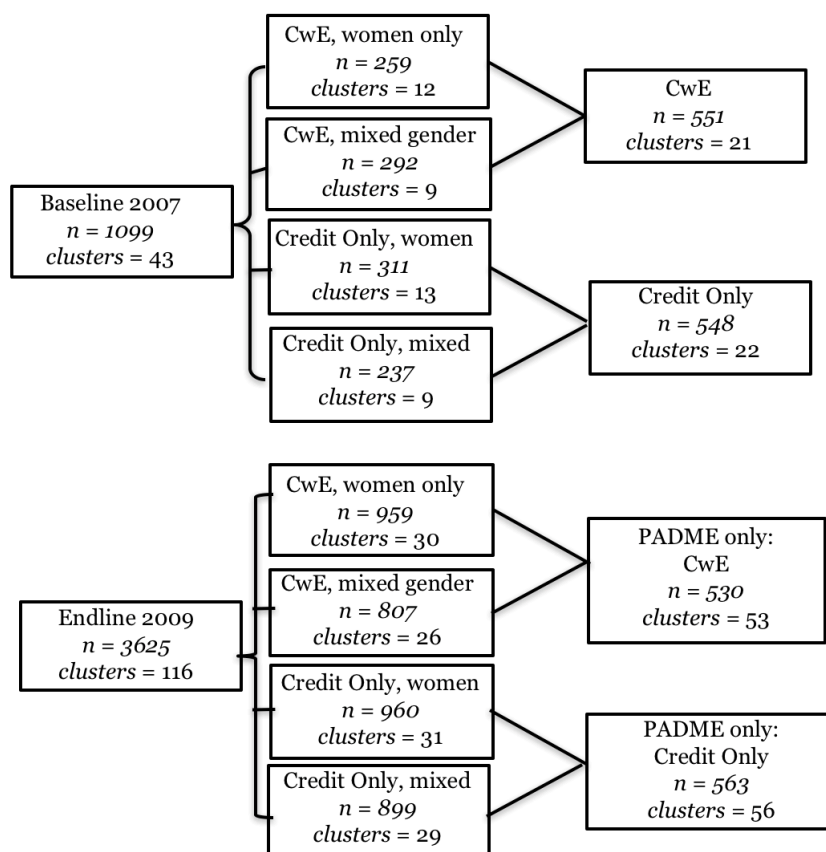


Table 5.1 Empowerment Measure Factor Loadings and Goodness of Fit

	Baseline		Endline	
RMSEA	0.048		0.47	
CLI	0.982		0.987	
TLI	0.977		0.983	
N	991		1093	
	Factor Loading	<i>p</i>	Factor Loading	<i>p</i>
<i>Decision-making</i>				
Who decides to send the children to school or not?	0.801	0.00	0.836	0.00
Who decides what community groups the children can participate in?	0.844	0.00	0.863	0.00
Who decides on what goods the family will buy or sell?	0.884	0.00	0.883	0.00
Who decides about working outside the home or not?	0.833	0.00	0.83	0.00
<i>Freedom of Movement</i>				
Are you allowed to go to the market alone?	0.904	0.00	0.772	0.00
Are you allowed to go to the health center alone?	0.911	0.00	0.83	0.00
Are you allowed to go to a friend's house alone?	0.741	0.00	0.685	0.00
Are you allowed to go a religious place alone?	0.825	0.00	0.847	0.00
<i>Leadership</i>				
In the past 12 months, have you been an active member of one of these types of community groups?	0.671	0.00	0.725	0.00
In the past 12 months, did you speak up at a community meeting?	0.367	0.00	0.267	0.00
In the past 12 months, have you been a candidate or elected to a community post?	0.832	0.00	0.73	0.00
Empowerment by:				
<i>Decision-making</i>	0.706	0.00	0.625	0.00
<i>Freedom of Movement</i>	0.252	0.00	0.275	0.00
<i>Leadership</i>	0.271	0.00	0.356	0.00
<i>Contribution to household revenue</i>	0.565	0.00	0.523	0.00

Table 5.2 Summary Statistics

	Baseline - 2007			Endline - 2009		
	Credit Only	Credit with Education	Total	Credit Only	Credit with Education	Total
n	503	488	991	563	530	1093
Age	35	35.4	35.2	31.8	32.0	31.1
Marital Status						
Monogamous	50.9%	52.1%	51.5%	46.9%	54.3%	50.5%
Polygamous	38.2%	33.8%	36.0%	50.4%	45.1%	47.9%
Widowed	6.2%	6.8%	6.5%	1.2%	-	0.6%
Single	0.6%	2.5%	1.5%	-	-	0.0%
Free union	0.6%	0.4%	0.5%	0.2%	0.2%	0.2%
Separated/divorced	1.2%	2.5%	1.8%	1.2%	0.4%	0.6%
No response	2.4%	2.1%	2.2%	0.4%	-	0.2%
Highest level of education						
No education	86.1%	84.0%	85.1%	85.1%	87.2%	86.1%
Kindergarten	1.0%	0.8%	0.9%	0.9%	0.2%	0.6%
Primary school	11.1%	11.9%	11.5%	10.5%	8.9%	9.7%
Secondary or higher	1.2%	2.7%	1.9%	2.9%	3.4%	3.1%
No response	0.6%	0.6%	0.6%	0.7%	0.4%	0.6%
Able to read	9.7%	8.0%	8.9%	12.3%	12.3%	12.3%
Religion						
Christian	65.6%	58.2%	62.0%	73.0%	66.4%	69.8%
Muslim	21.1%	28.1%	24.5%	18.3%	23.4%	20.8%
Traditional African	11.5%	11.3%	11.4%	6.2%	8.1%	7.1%
Other	1.0%	1.2%	1.1%	0.4%	0.8%	0.6%
No religion	0.8%	1.2%	1.0%	1.8%	0.9%	1.4%
No response				0.4%	0.4%	0.4%
Revenue in past 7 days (CFA)	18541	25478	21957	15203	12862	14068
Revenue in past 7 days (USD)	\$39.10	\$53.73	\$46.31	\$32.06	\$27.13	\$29.67
Profit in past 7 days (CFA)	3703	5635	4654	3058	3539	3291
Profit in past 7 days (USD)	\$7.81	\$11.88	\$9.82	\$6.45	\$7.46	\$6.94

Table 5.3 Average marginal effects of Credit with Education and empowerment on revenue

	(R1)	(R2)	(R3)	(R4)	(R5)	(R6)	(R7)
Revenue (USD)	Base	Empowerment	Decision-making	Movement	Leadership	Contribution	All
2009	-7.46 (5.24)	-5.87 (5.39)	-7.28 (5.28)	-6.86 (5.13)	-6.96 (5.09)	-5.50 (5.29)	-6.15 (4.91)
CwE	11.95 (8.15)	12.44 (8.29)	12.30 (8.43)	12.35 (2.5)	12.81 (8.07)	11.26 (7.90)	11.92 (7.77)
Program Effect	-18.23 (9.37)	-18.49 (9.49)	-18.06 (9.44)	-18.84* (9.21)	-18.80* (9.45)	-17.72 (9.14)	-17.33* (8.67)
Empowerment		20.81*** (5.75)					
Decision-making			8.70*** (2.43)				7.57** (2.72)
Movement				2.58 (4.39)			-2.72 (4.41)
Leadership					10.23** (3.63)		6.16 (3.67)
HH Contribution							
Small part						12.87* (5.39)	13.26* (6.07)
Less than half						17.16* (5.52)	14.57* (6.20)
Half						26.39** (6.47)	23.66** (6.96)
Most						25.63* (8.32)	20.65* (8.54)
All						15.77* (7.45)	7.94 (15.14)
N	2084	2084	2084	2084	2084	2084	2084

Standard errors in parentheses

="* p<0.05

** p<0.01

*** p<0.001"

Table 5.4 Average Marginal Effects of Credit with Education and empowerment on profit

	(P1)	(P2)	(P3)	(P4)	(P5)	(P6)	(P7)
	Base	Empower- ment	Decision- making	Movement	Leader- ship	Contri- bution	All
Profit							
2009	-1.59 (0.95)	-1.21 (1.00)	-1.44 (0.96)	-1.16 (0.96)	-1.53 (1.00)	-1.33 (1.03)	-1.11 (1.02)
CwE	3.49 (2.33)	3.32 (2.23)	3.53 (2.40)	3.60 (2.28)	3.54 (2.38)	2.91 (1.84)	3.15 (1.90)
Program Effect	-2.28 (2.61)	-2.30 (2.45)	-2.37 (2.61)	-2.57 (2.55)	-2.57 (2.61)	-2.04 (2.14)	-2.32 (2.15)
Empowerment		5.95** (1.74)					
Decision-making			1.86* (0.61)				0.97 (0.55)
Movement				2.20* (1.01)			0.83 (0.83)
Leadership					2.59** (0.91)		1.18 (0.81)
HH Contribution							
Small part						2.34* (1.03)	2.45* (1.16)
Less than half						3.17** (0.96)	2.71** (1.04)
Half						4.55** (1.42)	4.11** (1.52)
Most						9.68** (3.49)	2.65** (1.34)
All						4.28** (1.42)	2.65* (1.34)
N	2084	2084	2084	2084	2084	2084	2084

Standard errors in parentheses

="* p<0.05

** p<0.01

*** p<0.001"

Table 5.5 Average Marginal Effects of Interaction Term (CwE*Empowerment) by Terciles

	(1)	(2)
	Full Sample	Empowerment at Baseline
N	2084	1337
<hr/>		
Revenue		
Low	-14.28* (6.96)	1.08 (8.29)
Medium	-13.92 (8.69)	-5.61 (16.45)
High	-18.45 (10.76)	-20.42 (10.51)
<hr/>		
Profit		
Low	-2.46 (1.43)	0.33 (2.01)
Medium	-2.33 (2.36)	-1.62 (1.86)
High	-0.69 (4.27)	-6.35 (3.45)
<hr/>		

Table 5.6 GLM coefficient estimates of various models on revenue

	(R8)	(R9)	(R10)	(R11)	(R12)	(R13)
	Empower control	Interaction w/ continuous empowerment variable	Interaction w/ empowerment terciles	Empower control	Interaction w/ continuous empowerment variable	Interaction w/ empowerment terciles
	Full Sample			Baseline Empowerment		
Revenue						
2009	-0.155 (0.141)	-0.162 (0.141)	-0.185 (0.142)	-0.336** (0.106)	-0.331** (0.105)	-0.308** (0.0983)
CwE	0.329 (0.207)	0.327 (0.207)	0.326 (0.207)	0.291 (0.201)	0.284 (0.202)	0.271 (0.187)
Program Effect	-0.489* (0.232)	-0.471* (0.234)	-0.540* (0.253)	-0.298 (0.230)	-0.163 (0.244)	0.0331 (0.254)
Empowerment	0.550*** (0.144)	0.464* (0.184)		0.609 (0.755)	0.778 (0.826)	
Progeff*Empower		0.366 (0.284)			-1.538 (0.970)	
Medium (2)			0.165 (0.143)			0.440* (0.171)
High (3)			0.393* (0.155)			0.344 (0.241)
Progeff*Med			0.117 (0.240)			-0.153 (0.376)
Progeff*High			0.0873 (0.222)			-0.636* (0.282)
_cons	9.783*** (0.117)	9.788*** (0.117)	9.615*** (0.169)	9.796*** (0.109)	9.788*** (0.108)	9.555*** (0.113)
N	2084	2084	2084	1337	1337	1337
Standard errors in parentheses						
="* p<0.05 ** p<0.01 *** p<0.001"						

Table 5.7 GLM coefficient estimates of various models on profit

	(P8)	(P9)	(P10)	(P11)	(P12)	(P13)
	Empower control	Interaction w/ continuous empowerment variable	Interaction w/ empowerment terciles	Empower control	Interaction w/ continuous empowerment variable	Interaction w/ empowerment terciles
Profit	Full Sample			Baseline Empowerment		
2009	-0.145 (0.118)	-0.156 (0.116)	-0.173 (0.117)	-0.259* (0.122)	-0.247* (0.125)	-0.308** (0.0983)
CwE	0.397 (0.240)	0.402 (0.242)	0.415 (0.241)	0.371 (0.219)	0.353 (0.215)	0.271 (0.187)
Program Effect	-0.275 (0.282)	-0.256 (0.286)	-0.424 (0.246)	-0.448 (0.281)	-0.227 (0.263)	0.0331 (0.254)
Empowerment	0.712*** (0.165)	0.538*** (0.158)		0.865 (0.807)	1.186 (0.875)	
Progeff*Empower		0.709 (0.445)			-2.648* (1.221)	
Medium (2)			0.180 (0.154)			0.440* (0.171)
High (3)			0.423** (0.138)			0.344 (0.241)
Progeff*Med			0.106 (0.239)			-0.153 (0.376)
Progeff*High			0.358 (0.338)			-0.636* (0.282)
_cons	8.174*** (0.100)	8.179*** (0.0998)	7.988*** (0.151)	8.174*** (0.0965)	8.159*** (0.0954)	9.555*** (0.113)
N	2084	2084	2084	1337	1337	1337

Standard errors in parentheses

="* p<0.05

** p<0.01

*** p<0.001"

Full sample

Figure 5.2 Average marginal program effect on predicted mean revenue at varying levels of empowerment (continuous)

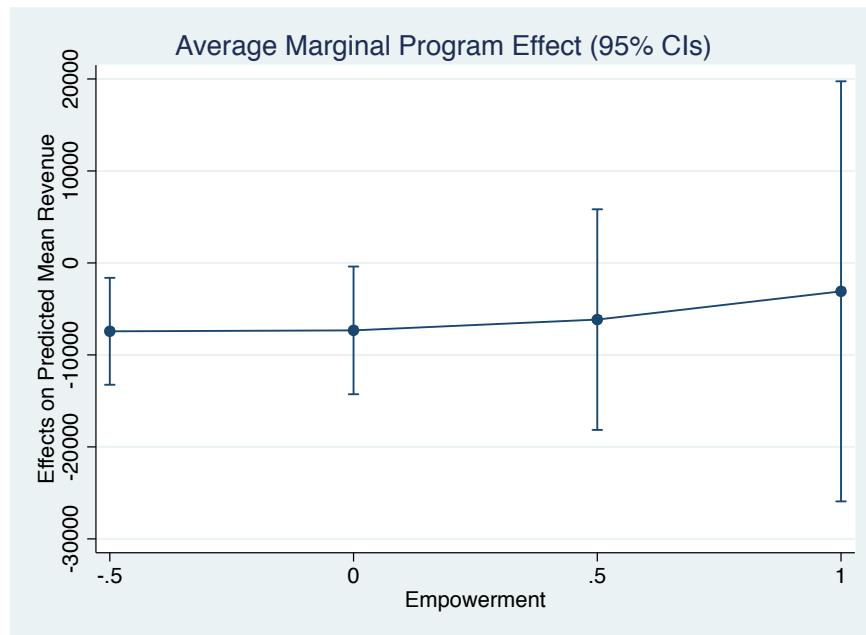


Figure 5.3 Average marginal program effect on predicted mean profit at varying levels of empowerment (continuous)

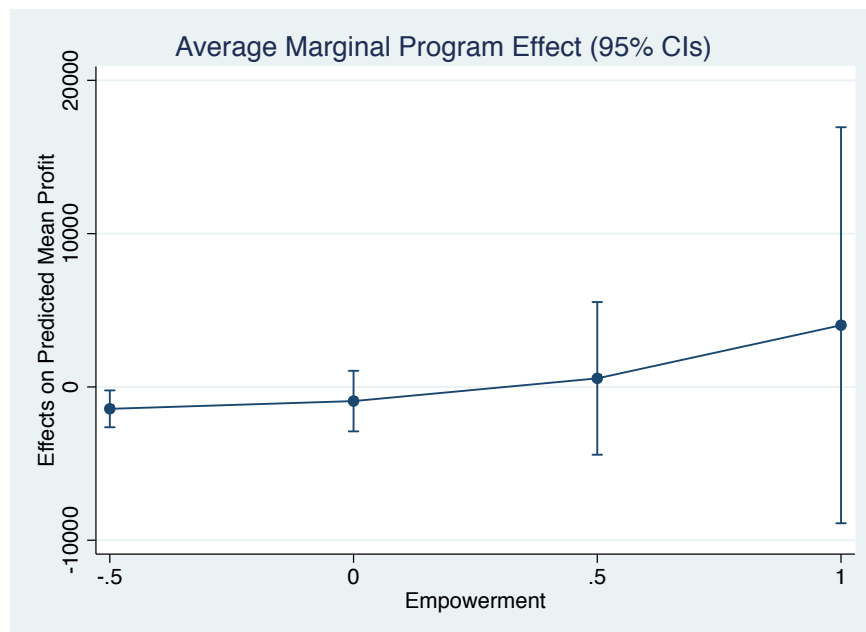


Figure 5.4 Average marginal program effect on predicted mean revenue for empowerment groups

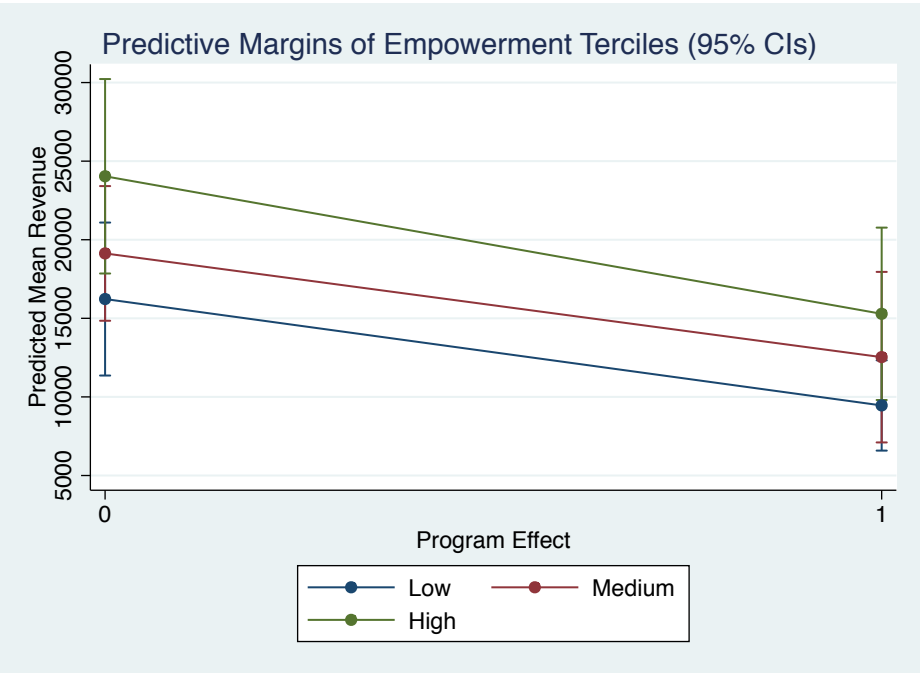
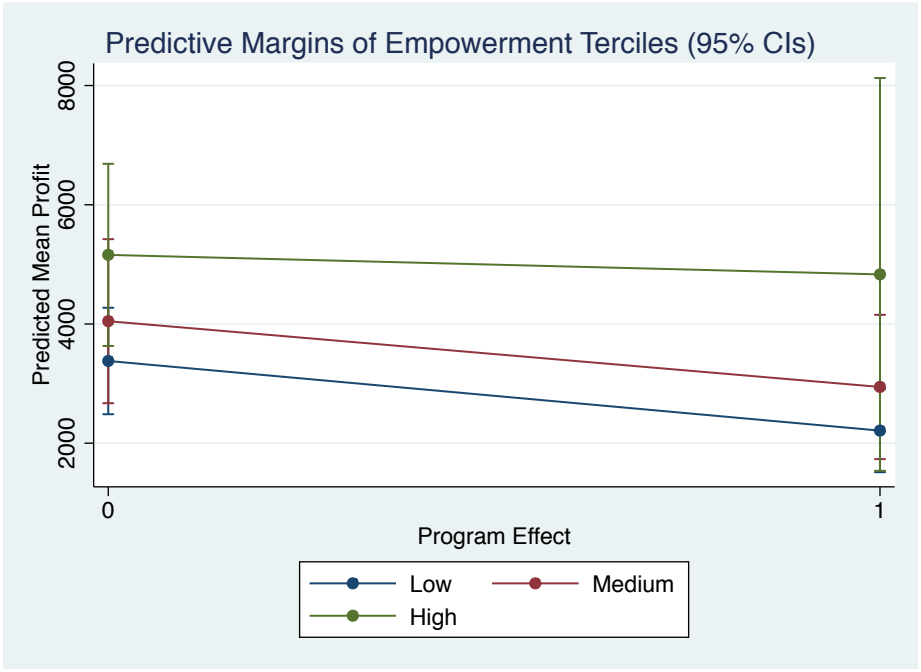


Figure 5.5 Average marginal program effect on predicted mean profit at varying levels of empowerment (terciles)



Baseline Only

Figure 5.6 Average marginal program effect on predicted mean revenue at varying levels of baseline empowerment (continuous)

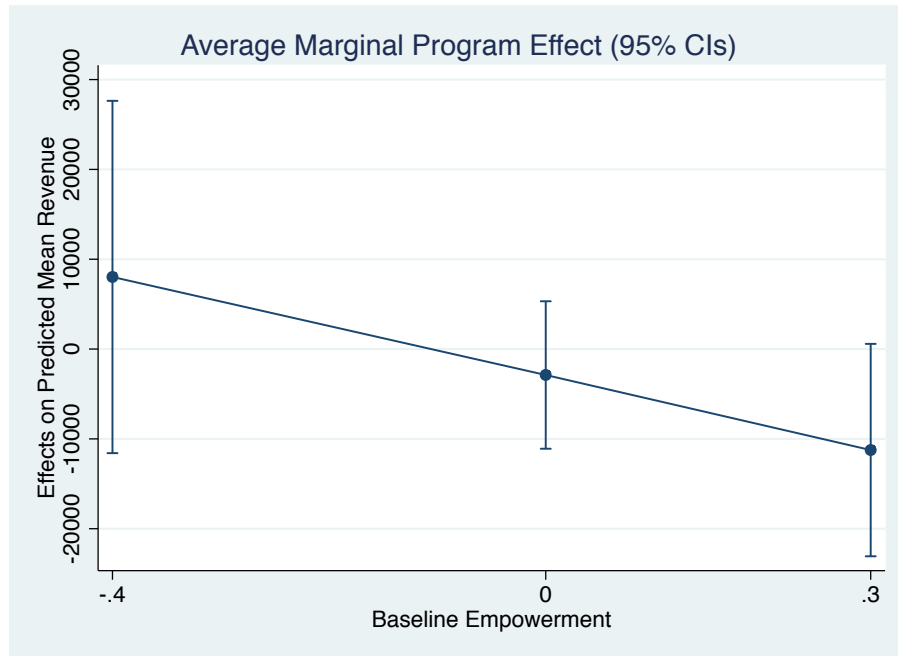


Figure 5.7 Average marginal program effect on predicted mean profit at varying levels of baseline empowerment (continuous)

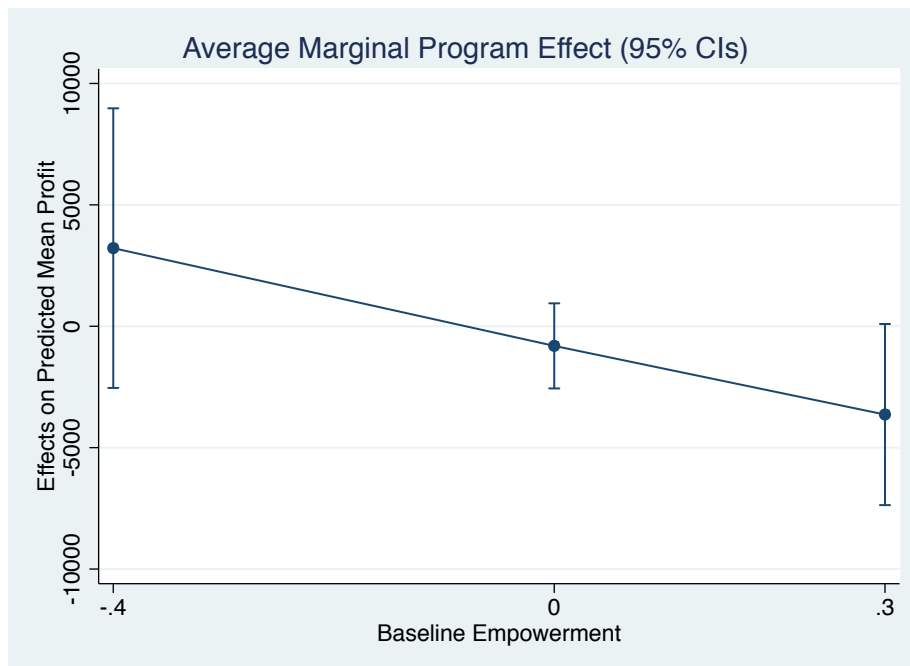


Figure 5.8 Average marginal program effect on predicted mean revenue for baseline empowerment groups

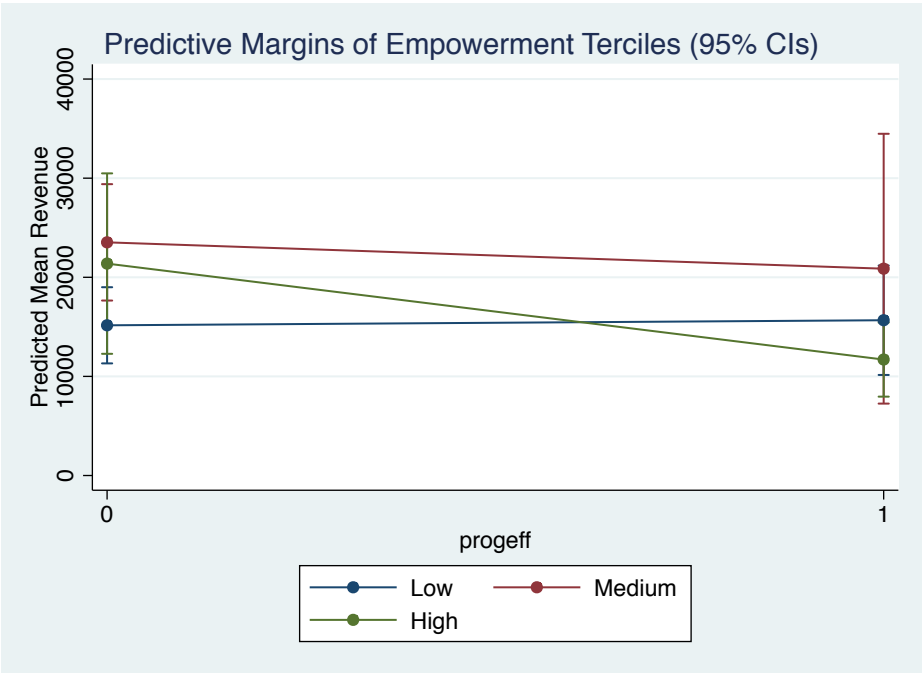
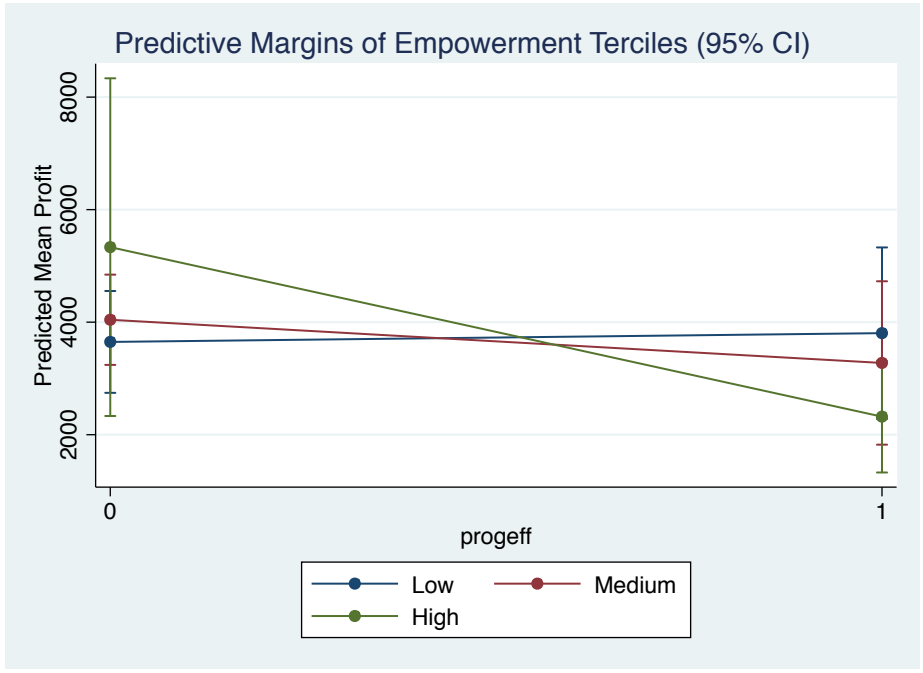


Figure 5.9 Average marginal program effect on predicted mean profit for baseline empowerment groups



CHAPTER 6. CONCLUSIONS

This study had an overarching goal of understanding the value of integrating microfinance and health for clients. We first conducted a systematic literature review to assess the observed effects of this combined approach and found that microfinance is being integrated with a variety of health products in low- and middle-income countries. Microfinance has been bundled with health education, health micro-insurance, direct and indirect linkages to health providers, and access to health products. Combining microfinance with a health component has been effective to some extent, but the most convincing evidence is for microfinance and health education. This integrated approach has demonstrated effects in improving health knowledge, attitudes, and some behaviors. However, there was a dearth of information on the effect of integrating programs on client financial outcomes, such as revenue and profit. In order to support the integration of these two sectors, it is essential that we understand both the health and financial implications of a combined approach.

We used data from a cluster RCT in Benin to analyze the effect of an integrated microfinance and health education intervention on client reported revenue and profit in the past seven days. We used a difference-in-differences approach to model the effect of the program, differencing out the means between intervention groups as well as the change in revenue and profit over time. We found that although participants in the CwE group reported decreases in revenue and profit relative to those receiving only credit, the CwE program did not have significant effects on profit. However, the effect was approaching significance for revenue ($p=0.052$). Then, given the evidence that empowering women helps achieving gains across various health and development outcomes, we analyzed if women who were more empowered performed better than their less empowered counterparts. When controlling for all other

variables, empowerment had a significant positive effect on both revenue and profit. We anticipated empowerment to have a strong effect based on how this measure was constructed and the qualitative support for the various dimensions within empowerment. Our analysis found some evidence that revenue and profit improved as empowerment score increased. For the full sample, CwE participants with a medium level of empowerment reported significant decreases in revenue compared with credit-only clients, and CwE participants with a low level of empowerment reported significant decreases in profit relative to the credit-only group. However, this effect was not supported in the analysis using only cluster-level average baseline level of empowerment.

This analysis did not support our initial hypotheses that women participating in CwE would have improved outcomes relative to the credit-only group. It may be that CwE participants were confronted with a number of trade-offs. First, given the information they gained on health, CwE participants may spend more time on health-enhancing activities, thereby limiting the time they spend on their business endeavor in any given week. A reduction in time spent focusing on business may well be reflected in the revenue and profit. Or, due to the health information they gained, such as the importance of purchasing and using mosquito nets or bringing sick children to health facilities, CwE participants may have invested more resources in health than the credit-only participants. Another possibility is that CwE participants are engaged with mechanisms that help smooth consumption, such as savings accounts, tontines, or even multiple concurrent loans.

However, the abovementioned financial trade-off scenarios are only realistic assumptions if we consider revenue and profit to be measured with some degree of error. Specifically, if participants do not dutifully keep their business earnings and their household expenditures separate, there may have been some degree of error in how they recalled and reported their revenue and profit in the past seven days. We would hope this would not be the case since PADME offers a brief business training to all credit clients, and other research has

found that groups receiving business and financial education have experienced improvements in business and financial outcomes (Karlan and Valdivia, 2011; Drexler *et al.*, 2014). Nevertheless, given the education and literacy levels of our sample, it is not unreasonable to speculate that there may be some degree of accounting error. Ideally, we would have health expenditure information or more robust data on clients' other financial investments to better assess these theories. However, we were unable to do so in this analysis and therefore recommend that future research on client financial outcomes plan to consider these alternatives as part of the evaluation.

Perhaps a more plausible scenario is that CwE participants had challenges in terms of comprehension and recall, or the ability to meaningfully absorb and apply both microfinance and health-related information. Credit-only clients may have performed better than their CwE counterparts because they were only tasked with focusing on their business. CwE participants, on the other hand, had to focus on business as well as make decisions about how to improve the health of their family. Many women may already be balancing those decisions for their family, making this an unfair assessment; however, it may be still be important for future studies to understand participants' capacity to meaningfully absorb and use different types of information, and how such knowledge may affect health and business decision-making (Mullainathan and Shafir, 2013).

Judging the success of PADME's CwE program based on the amount of revenue and profit generated by participants may be narrow-sighted. Understanding why women joined the group in the first place may be important to consider. In our qualitative analysis of empowerment, we asked about the types of groups that are available for women to join within the community and the reasons why they might be interested in participating. One-third of women specifically mentioned microfinance or tontines. Also listed were spiritual groups, choral groups, funeral groups, or groups that rallied around a common identity, such as farming or those who sell *lafou* in the marketplace. Regardless of group, women consistently commented

that they join groups for *support* – logistical, emotional, and financial. In households that have so little, individuals depend on the broader community to fill in gaps. It may be that although microfinance groups have the primary objective of helping women earn money, the ancillary reasons for joining may be just as strong (i.e. sense of community or being able to turn to a specific group of women for all matters of support). In the case of integrated microfinance and health groups, it may be that some women have a more vested interest in the health component. In general, turning a large profit may not be the objective for a certain subset of women so long as their microfinance endeavor allows them to make ends meet.

There are myriad potential factors to consider when assessing the characteristics of successful microfinance and health participants. One factor of interest is women's empowerment, which refers to a process whereby women are able to make strategic life choices when previously this ability was not available to them (Malhotra and Schuler, 2005). Groups or individuals may operate differently in large structural interventions, such as PADME's CwE program, based on their ability to make choices and exercise their personal power. There are major challenges to measuring empowerment. Namely, it is an unobservable, culture bound variable that is informed by a number of experiences, decisions, or positions held by an individual. It is also ever-changing, with women becoming exposed to new experiences that are either empowering or disempowering. Women engaging in interventions or groups that foster collective action, for example, may serve as a catalyst for taking on greater responsibility or decision-making within the home (DeVries and Rizo, 2015). Each individual approaches a microfinance intervention with their own level of pre-exposure empowerment.

Our analysis provided mixed results of empowerment on revenue and profit. Although empowerment had a positive and significant effect when controlling for other variables, the effect of empowerment was less clear when examining how program effect on average revenue and profit changed as empowerment increased or decreased. In the full sample, empowerment seemed to have a protective effect, but the opposite appeared true when examining average

empowerment at baseline. The latter scenario contradicts our perceptions of how empowerment operates, but if true, begs us to reconsider how empowerment functions within the microfinance context. It could be that more empowered women have less time available to spend on business given other family and community commitments. Ultimately, more research is necessary to better understand this dynamic relationship.

Limitations

This analysis includes certain limitations. First, there may be some measurement error in client reported revenue and profit. Respondents were asked to report their revenue and profit over the past seven days, which is not objective and may be subject to recall bias. The short time frame was meant to mitigate recall; however, this question structure precludes those whose income is generated on a seasonal or monthly basis (i.e. farmers). This may have led to underreporting of revenue and profits, though this would have been balanced across groups due to randomization. Future studies might try to use a more objective measure of annual income. Second, the cross-sectional nature of the study does not allow us to evaluate the effect of the program at the individual-level. This applies to dependent variables as well as the the cluster-level analysis of empowerment, which may have reduced our ability to meaningful measure empowerment at baseline. We used a rigorous method to create our empowerment measure that included CFA as well as a qualitative assessment of the measure. Nevertheless, we did not use an empowerment tool that has been tested as valid and reliable for constructing this measurement. There may be some dimensions that relate to empowerment in the Beninese context but were not included in the survey dataset (i.e. legal). Also, our measure was designed at an individual level, and a village-level aggregated measure may need to measured differently to ensure accuracy. Future research should attempt to measure empowerment prospectively and incorporate the various steps necessary to ensuring the measure fits within the appropriate context. Finally, although there were two years between baseline and follow-up, the intervention

period may not have been long enough to fully evaluate a change in revenue and profit, as education must first translate into knowledge, then to behavior change before finally generating the changes we sought to measure. It may be useful to look for a change in revenue and profit over a more extended period of time.

Future Directions

This analysis sought to understand the value of integrating microfinance and health as a cross-sectoral approach. Although there are observed health-related benefits, this analysis does not support that financial outcomes also improve for clients in integrated programs. This may be aligned with some expert assessment that when microfinance is bundled with other social services it detracts from the ability to deliver effective financial services (Kabeer, 2001). However, data limitations constrain our ability to draw such a conclusion. Instead, we find no evidence of synergy by combining microfinance and health approaches. However, there are many opportunities for future studies to help contextualize these findings within a broader body of research. Although our systematic review found that the number of RCTs conducted on the subject have increased in recent years, we need more rigorous studies with randomized designs to improve the quality of evidence for integrating these two sectors. Specifically, studies should be designed with multiple study arms such that it is possible to decipher the distinct effect of the microfinance versus health components as well as their effect when combined. Studies evaluating the effect of an integrated program should take both health and financial outcomes into consideration to further assess the value add of bundling these services. Also, the current evidence rarely successfully measured changes in behaviors and broader health outcomes. Future studies may include more indicators of health status and be conducted over longer time periods so as to more reliably document the pathway from knowledge to behavior change to health outcome.

There are also opportunities to advance research in terms of understanding financial implications of integrated programs on clients. To begin, future studies should include a more objective measure of revenue and profit as well as more closely capture a range of household finances, including savings accounts, tontines, and formal and informal loans that contribute to overall household finances. Moreover, investigators could compare client reported data against administrative data collected from the MFI to generate more objective measures. Collecting information on health expenditures, including routine care, curative care, and health-related products would allow researchers to more clearly understand if and how clients are making financial trade-offs. Qualitative data could also be leveraged to explain the types of trade-offs clients are making and how the information and resources gained from program participation translate to their daily lives. Qualitative data may also elucidate the impetus for clients to join microfinance or integrated programs and how this relates to their own expectations for earning revenue and profit.

There is still much to uncover about the relationship between microfinance and empowerment. One criticism of microfinance is that it often does not reach the poorest-of-the-poor but rather the near-poor. This selection bias may be in some way related to level of empowerment, inasmuch as near-poor may be more empowered and have the ability and resources to join a microfinance group, whereas poorer groups do not. Future research should use valid and reliable measures of empowerment in groups of clients and non-clients to evaluate this relationship. More generally, this area of research would benefit from standardized measures of empowerment that are validated within the cultural context. As the field of empowerment continues to progress, valid and reliable measures continue to emerge. These will need to be applied rigorously, prospectively, and at the individual-level if we hope to understand how empowerment operates differentially for clients.

Evaluating the individual and synergistic effects of combining microfinance and health is important for determining the future of this cross-sectoral development approach within low-

and middle-income countries. Although the evidence for integrating microfinance and health seems promising in terms of health and social benefits, equal importance must be placed on improving financial outcomes for clients. If IMH has a negative, or even null, effect on financial outcomes, it is worth considering if empowerment and health strategies could be better applied in tandem with other programs that do not pose such high financial risks. Although women tend to be reliable borrowers, there are some criticisms that microfinance can indebt already poor households, create tensions within families, and catch vulnerable households in the poverty trap. Lower-risk integrated approaches may be available if future research demonstrates that IMH does not produce reasonable financial outcomes for clients. Empowerment may play an important role in foreseeing how clients will perform. If we are able to prospectively identify clients who may require additional support, we can provide them with a tailored package of services that assists them in achieving their goals. Or, we may be able to divert those potential clients away from microfinance and into more appropriate programs that foster social or financial inclusion. Ultimately, if we believe there is value-add to combining microfinance and health, we require more rigorous evaluations of this integrated approach to better justify its ubiquitous uptake across low- and middle-income countries.

ANNEX A: ANALYSIS OF INTEGRATED MICROFINANCE AND HEALTH PROGRAMS

Study (date)	Design	Subjects and sample	Control Condition	Outcomes of Interest	Key Findings: Quantitative	Main Limitations	Quality Score
Agha <i>et al.</i> (2004)	<ul style="list-style-type: none"> •Quasi-experimental •Cross sectional baseline and follow-up surveys with non-equivalent comparison group 	<ul style="list-style-type: none"> •<i>n</i>=22 clinics (<i>n</i>=15 in intervention; <i>n</i>=7 in control) •<i>n</i>=1690 clients accessing intervention clinics •<i>n</i>=739 clients accessing control clinics 	<ul style="list-style-type: none"> •Control clinics did not receive loans •Comparison clinics were selected based on similarity to intervention clinics in terms of client volume, facilities, and range of services provided 	<ul style="list-style-type: none"> O.1. Client perceptions of service quality O.2. Service utilization 	<ul style="list-style-type: none"> •Significant improvement in service utilization and client perceptions of quality across 4 of 8 indicators •Quality-related reasons for visiting clinic were associated with patient loyalty •High rate of loan repayment followed by additional and larger loans 	<ul style="list-style-type: none"> L.1. Non-random group assignment L.2. Short intervention period may underestimate impacts L.3. Does not use validated quality measures 	Moderate
Ahmed <i>et al.</i> (2006)	<ul style="list-style-type: none"> •Quasi-experimental •Longitudinal baseline and follow-up surveys 	<ul style="list-style-type: none"> •<i>n</i>=2189 intervention households •<i>n</i>=2134 control households •3 purposively selected district. Program villages randomly sampled; all intervention households qualified •Control households in same villages selected at random 	<ul style="list-style-type: none"> •Ultra poor households in the same villages as intervention households but not receiving inputs from the CFPR/TUP program 	<ul style="list-style-type: none"> O.1. Care-seeking behavior (self-care, traditional care vs. formal care) O.2. Deficit status O.3. Health expenditures 	<ul style="list-style-type: none"> •Poverty status was improved, increasing capacity for health expenditures •Significant increase in care seeking at formal provider for both groups, but overall program effects were not significant. •Increase health knowledge, awareness of resources, immunizations, and perceived health status and use of formal health services 	<ul style="list-style-type: none"> L.1. Selection bias L.2. Potential contamination limiting overall program impact L.3. Program districts not randomly selected 	Moderate

611	Amin <i>et al.</i> (2001)	<ul style="list-style-type: none"> •Quasi-experimental •Cross sectional baseline and follow-up surveys 	<ul style="list-style-type: none"> •Phase I: 1992 baseline household survey of 656 women from experimental area; 1997 follow-up survey of 2105 women and 1721 women from experimental and control areas •Phase 2: 1998 post-intervention survey of 1068 women and 700 women from experimental and control areas 	Not specified, but geographically separate from experimental areas	O.1. Fertility rate O.2. Contraceptive use rate O.3. Infant mortality rate O.4. Immunization rates	<ul style="list-style-type: none"> •Significant increase in contraceptive use and decline in fertility •No decline in infant mortality rate •Increase in dissemination of information and utilization of ESP services in broader community 	L.1. Purposive selection of experimental and control areas L.2. Concurrent programs in microfinance and family planning in all areas L.3. Self-selection L.4. No baseline data for controls	Low
	Arrivillaga <i>et al.</i> (2014)	<ul style="list-style-type: none"> •Pre-post without control •Baseline & follow-up surveys with all participants 	<ul style="list-style-type: none"> •n=48 women living with HIV/AIDS on anti-retroviral therapy 	No control	O.1. Knowledge of HIV O.2. Knowledge of treatment O.3. Score of adherence O.4. Score of self-efficacy O.5. Formation of micro-enterprise	<ul style="list-style-type: none"> •Increase in knowledge of HIV/AIDS ($p<0.001$) •Increase in knowledge of treatment ($p<0.001$) •Increase in adherence to treatment ($p<0.001$) •Increase in self-efficacy for work ($p<0.001$) •29% of participants were able to form and sustain clothing enterprise 	L.1. Non-experimental design without control group L.2. Small sample size L.3. Intervention microfinance component facilitated access but did not guarantee a loan for participants	Low
	Banerjee <i>et al.</i> (2014)	<ul style="list-style-type: none"> •Community randomized trial •Longitudinal baseline and follow-up surveys 	<ul style="list-style-type: none"> •n=101 villages required to purchase health insurance •n=100 control villages •Intervention groups selected randomly from 	<ul style="list-style-type: none"> •Controls borrowers were not required to purchase health insurance •Remaining MFI candidate villages not randomized to intervention 	O.1. Loan renewal decisions O.2. Adverse selection (socio-economic conditions for renewers)	<ul style="list-style-type: none"> •Clients in treatment villages were 23% less likely to take out loan within one year from pilot start date ($p<0.001$), representing a net loss in access to microfinance •No evidence of adverse 	L.1. Insurance became voluntary before endline due to client discontent L.2. Self-selection	Moderate

		MFI candidate villages			selection across variety of household characteristics		
De la Cruz <i>et al.</i> (2009)	<ul style="list-style-type: none"> •Community randomized trial •Cross sectional baseline & follow-up surveys 	<ul style="list-style-type: none"> •<i>n</i>=213 in malaria education intervention •<i>n</i>=223 in standard diarrhea education •<i>n</i>=268 in control group •Microcredit communities randomly assigned to receive either malaria or diarrhea education; all clients in comm. received intervention 	<ul style="list-style-type: none"> •Controls were randomly selected non-clients in malaria education communities 	<ul style="list-style-type: none"> O.1. Malaria knowledge O.2. Malaria attitudes O.3. Malaria behaviors 	<ul style="list-style-type: none"> •Overall increase in knowledge across all groups; malaria clients were more likely to identify vulnerable groups and report ITNs as best form of protection •Significant increase in knowledge of warning signs of malaria during pregnancy ($p < 0.001$) in IG •Malaria clients were significantly more likely than non-clients to own at least 1 ITN •Training did not change treatment-seeking behavior for children < 5 	<ul style="list-style-type: none"> L.1. Group differences at baseline L.2. Concurrent malaria initiatives may have contaminated outcomes L.3. Self-selection 	High
Desai and Tarozzi (2010)	<ul style="list-style-type: none"> •Community randomized trial •Cross sectional baseline & follow-up surveys 	<ul style="list-style-type: none"> •<i>n</i>=6440 households at baseline (356 villages) •<i>n</i>=6275 households at follow-up (same villages as baseline) •133 peasant organizations randomly allocated, stratified by region 	<ul style="list-style-type: none"> •Control group received neither micro-credit nor family planning services •Comparison groups received either micro-credit only or family planning services only, but not both 	<ul style="list-style-type: none"> O.1. Contraceptive use 	<ul style="list-style-type: none"> •The integrated program did not increase contraceptive use more than either intervention on its own •No program (linked or unlinked) increase contraceptive use significantly more than control group 	<ul style="list-style-type: none"> L.1. Potential for contamination across villages L.2. Estimated average exposure, not actual use of program L.3. Village-level data may mask heterogeneous effects 	High

Dohn <i>et al.</i> (2004)	<ul style="list-style-type: none"> •Quasi-experimental •Cross sectional baseline and follow-up surveys 	<ul style="list-style-type: none"> •$n=27$ households in each area 	<ul style="list-style-type: none"> •One community received integrated approach; the other two communities received only micro-credit or health promotion, serving as a control to the other component 	O.1. Health knowledge O.2. Health behaviors O.3. Community involvement	<ul style="list-style-type: none"> •8 of 11 health indicators improved significantly in integrated community ($p<0.05$ or greater) •5 of 11 health indicators improved significantly for health promotion program only ($p<0.05$) •No indicators changed for micro-credit only community 	L.1. Small sample size L.2. Potential contamination of intervention L.3. Self-selection	Moderate
Flax <i>et al.</i> (2014)	<ul style="list-style-type: none"> •Cluster-randomized control trial •Longitudinal baseline and follow-up surveys 	<ul style="list-style-type: none"> •$n=229$ intervention •$n=232$ control •Respondents were pregnant at baseline and between 15-45 years 	<ul style="list-style-type: none"> •Microcredit only 	O.1. Exclusive breastfeeding at 6 months O.2. Exclusive breastfeeding to 1 and 3 months O.3. Initiation of breastfeeding within 1 hour of delivery O.4. Use of only colostrum or breast milk during first 3 days of life	<ul style="list-style-type: none"> •Odds of exclusive breastfeeding at six months increased ($p<0.01$) •Odds of exclusive breastfeeding through 3 months also increased ($p<0.05$) •Increase in timely breastfeeding initiation ($p<0.001$) 	L.1. Unclear which component of intervention is most effective L.2. Intervention exposure may have differed between implementing partner organizations L.3. Self-selection	High
Freeman <i>et al.</i> (2012)	<ul style="list-style-type: none"> •Case control study •Post-test only 	<ul style="list-style-type: none"> •$n=281$ adopters (SHG member who purchased filter) •$n=247$ non-adopters (SHG member who did not purchase the filter) •$n=251$ other community members 	<ul style="list-style-type: none"> •SHG member who received education and was offered a loan for the filter but did not purchase it 	O.1. Use of water filter O.2. Water treatment practices O.3. Water quality (mean thermotolerant chloriform [TTC] count)	<ul style="list-style-type: none"> •Adopters were more likely to treat drinking water than non-adopters (92.5% vs. 58.3%, $p<0.001$) •Adopters had better water quality than non-adopters; mean TTC count was 13.7 vs. 44.5, $p<0.01$) •Sub-optimal 	L.1. Non-random group assignment L.2. Post-test only L.3. Does not capture correct or consistent use of intervention filter	Low

					improvements in water quality, even among adopters		
Hadi (2001)	<ul style="list-style-type: none"> •Quasi-experimental •Cross-sectional survey 	<ul style="list-style-type: none"> •<i>n</i>=500 women with at least one child •Four strata: women in credit groups >5 years; women in credit groups <5 years (combined participants, <i>n</i>=258); poor women who were eligible but did not join (<i>n</i>=118); women of non-eligible households (<i>n</i>=124) 	<ul style="list-style-type: none"> •Compared against women who were eligible to join micro-credit program but did not 	<ul style="list-style-type: none"> O.1. Pre-natal care knowledge O.2. Post-natal care knowledge 	<ul style="list-style-type: none"> •Credit forum participation had a net positive effect on both pre- and post-natal care knowledge ($p<0.05$) •Longer duration corresponded with higher likelihood of having increased knowledge for pre- and post-natal care •Media exposure was also significantly correlated with increased knowledge, except for knowledge of tetanus vaccines 	<ul style="list-style-type: none"> L.1. Non-random group assignment L.2. Only one cross-section of data 	Moderate
Hadi (2002)	<ul style="list-style-type: none"> •Quasi-experimental •Cross-sectional survey 	<ul style="list-style-type: none"> •<i>n</i>=2814 women with at least one child <5 3 strata: non-credit participants (<i>n</i>=1239); active credit participants (<i>n</i>=958); non-eligible (<i>n</i>=618) 	<ul style="list-style-type: none"> •Microcredit only in comparison villages •2 geographically adjacent, non-random districts 	<ul style="list-style-type: none"> O.1. ARI symptom knowledge score O.2. ARI prevention knowledge score 	<ul style="list-style-type: none"> •34% of women in ARI communities could name at least 4 clinical signs of ARI, compared with 15.8% in non-ARI communities ($p<0.01$) •Prevention knowledge was much lower, but 30.7% of women in intervention could name at least 2 preventive measures, compared with 15.8% in control communities ($p<0.01$) •Net positive effect of program 	<ul style="list-style-type: none"> L.1. Non-random group assignment L.2. Only one cross-section of data L.3. Potential contamination with adjacent control communities 	Moderate

Hamad, Fernald, & Karlan (2011)	<ul style="list-style-type: none"> •Randomized control trial •Longitudinal baseline and follow-up surveys 	<ul style="list-style-type: none"> •Baseline: $n=920$ in treatment group, $n=935$ in control group •Follow up: $n=757$ in treatment group, $n=744$ in control group 	•Microcredit only	O.1. Health knowledge score O.2. Child health status	<ul style="list-style-type: none"> •Caregivers in IG were more knowledgeable in diarrhea danger signs ($p<0.01$) and knowledge of doctor's office activities ($p<0.01$) •Less educated parents in treatment group demonstrated more knowledge about doctor's office activities than more educated parents in treatment group •No difference in reported health status or anthropometric measures 	L.1. Unable to determine the effectiveness of each component in isolation L.2. High attrition	High
Hamid, Roberts, & Mosley (2011)	<ul style="list-style-type: none"> •Non-experimental •Cross-sectional survey 	<ul style="list-style-type: none"> •$n=329$ households 3 strata: microfinance branches with at least 5 years of MHI experience; 1-2 years of MHI experience; no MHI experience 	<ul style="list-style-type: none"> •No randomized control •Compared against households in GB area without MHI experience 	O.1. Health awareness O.2. Health status O.3. Health service utilization	<ul style="list-style-type: none"> •Established MHI clients had greater overall awareness ($p<0.01$) •Established MHI clients were more likely to utilize formal health services ($p<0.01$) •No significant improvements in reported health status 	L.1. Non-random assignment to experimental conditions L.2. Recall bias L.3. Single cross-section of data	Low
Kim <i>et al.</i> (2007)	<ul style="list-style-type: none"> •Quasi-experimental •Longitudinal baseline and follow-up surveys 	<ul style="list-style-type: none"> •$n=8$ villages (pair-matched and randomly assigned to intervention) •$n=430$ loan & education recipients (IG) •$n=430$ matched controls 	<ul style="list-style-type: none"> •Pair-matched to loan recipients based on age and poverty •Control group did not receive loans or education 	O.1. Women's empowerment O.2. Intimate partner violence	<ul style="list-style-type: none"> •After 2 years, the risk of past-year physical or sexual violence by intimate partners was reduced by more than half ($RR=0.45$; $[CI]=0.23, 0.91$) •Improvements in all 9 indicators of women's empowerment 	L.1. Small number of clusters (villages) L.2. Self-report or social desirability bias in IPV measures L.3. Self-selection	Moderate

Kim <i>et al.</i> (2009)	<ul style="list-style-type: none"> •Quasi-experimental •Longitudinal baseline and follow-up surveys 	<ul style="list-style-type: none"> •$n=8$ villages (pair-matched and randomly assigned to intervention) •$n=430$ loan & education recipients (IG) •$n=430$ matched controls •$n=540$ in comparison group of MF only 	<ul style="list-style-type: none"> •Pair-matched to loan recipients based on age and poverty •Control group did not receive loans or education •Comparison group received only microfinance, not comprehensive training or education 	O.1. Women's empowerment O.2. Intimate partner violence	<ul style="list-style-type: none"> •Both microfinance only and IMAGE groups showed economic improvements relative to control, but not statistically different from one another •IMAGE group showed consistent associations across all measures involving women's empowerment, IPV, and HIV risk-behavior, although only some of the empowerment measures were significantly different from microfinance alone 	L.1. Small number of clusters (villages) L.2. Self-report or social desirability bias in IPV measures L.3. Self-selection	Moderate
Landman & Frolich (2015)	<ul style="list-style-type: none"> •Randomized control trial •Cross-sectional baseline and follow up surveys 	<ul style="list-style-type: none"> •$n=13$ branches •$n=1320$ households in 9 treatment branches •$n=777$ households in 4 control branches 	Standard bundled micro-health insurance and microfinance product	O.1. Children working in hazardous occupations O.2. Child earnings O.3. School attendance	<ul style="list-style-type: none"> •Significant decrease in hazard occupation and child earnings for those offered supplementary insurance ($p<0.01$) •Marginal increase in school attendance for boys ($p<0.1$) but no change for girls •Significant effects suggest expanded health coverage for families improves child well being 	L.1. Examined effects at the branch level, leading to a small sample size L.2. Self-selection	High

Marquis & Colecraft (2014)	<ul style="list-style-type: none"> •Quasi-experimental •Longitudinal baseline and follow up surveys (4 time points) 	<ul style="list-style-type: none"> •$n=179$ households in intervention •$n=142$ non-participating households in intervention villages •$n=287$ households in control •$n=12$ communities (6 intervention, 6 control) •Respondents were caregivers of children aged 2-5 years 	<ul style="list-style-type: none"> •Caregivers in intervention communities who did not take out loans were considered non-participants •Control village were matched but did not receive either microcredit or education 	O.1. Weight for age z-score (WAZ) O.2. Height for age z-score (HAZ) O.3. BMI for age z-score (BAZ)	<ul style="list-style-type: none"> •Significant increase in BAZ for IG over time ($p<0.01$) •Significant increase in WAZ for IG over time ($p=0.04$) •Significant increase in HAZ for IG over time ($p=0.04$) 	L.1. Variation in exposure and duration of education L.2. Self-selection	Moderate
Marquis <i>et al.</i> (2015)	<ul style="list-style-type: none"> •Quasi-experimental •Longitudinal baseline and follow up surveys (4 time points) 	<ul style="list-style-type: none"> •$n=179$ households in intervention •$n=142$ non-participating households in intervention villages •$n=287$ households in control •$n=12$ communities (6 intervention, 6 control) •Respondents were caregivers of children aged 2-5 years 	<ul style="list-style-type: none"> •Caregivers in intervention communities who did not take out loans were considered non-participants •Control village were matched but did not receive either microcredit or education 	O.1. Income generating activities O.2. Food purchasing practices O.3. Consumption of ASF	<ul style="list-style-type: none"> •No change in income generating activity over time •At endline only, intervention group reported increase in profits compared with controls •At endline, increase in meat ($p<0.001$), fish ($p=0.003$), poultry ($p<0.001$), and milk ($p<0.001$) product consumption relative to control group 	L.1. Variation in exposure and duration of education L.2. Self-selection L.3. Analysis mostly compared at endline, not across time	Moderate
Muñoz <i>et al.</i> (2011)	<ul style="list-style-type: none"> •Quasi-experimental •Longitudinal baseline and follow up surveys 	<ul style="list-style-type: none"> •$n=60$ in intervention •$n=60$ match controls •Participants were poor HIV patients about to begin 	<ul style="list-style-type: none"> •Poor HIV patients about to begin HAART treatment but did not receive at-home support 	O.1. Psycho-social factors: depression, stigma, social support, self-efficacy, quality of life	<ul style="list-style-type: none"> •At 2 years, individuals in intervention more likely to be on HAART (87% vs. 52%, $p<0.01$) and report adherence to HAART relative to controls (79% vs. 41%, 	L.1. Non-random group assignment L.2. Small sample size	Moderate

		HAART treatment		O.2. ART adherence O.3. Virulologic suppression	p<0.01) •More TB patients in intervention completed treatment as cure relative to controls (82% vs. 49%, p<0.01) •Increased life spans for participants •Improved psychosocial factors such as reduced stigma and increased social support (p<0.01)		
Odek <i>et al.</i> (2009)	•Non-experimental •Pre-test/post-test	*n=227 FSW	*No control	O.1. Number of sexual partners O.2. Self-reported condom use O.3. Exit from sex work	•45.4% of women had exited from sex work at endline •Reduction in mean number of all sexual partners in past week (3.26 to 1.84, p<0.001) •Overall condom use was high at both time points, but increase in consistent condom use with regular partners (79% vs. 94%, p<0.001)	L.1. No control group L.2. Self-selection of participants into microenterprise initiative L.3. Self-report bias	Low
Panda, Chakraborty, & Dror (2015)	•Non-experimental •Cross-sectional baseline and follow-up surveys	•n=300 households (randomly selected at baseline and again at follow-up) •At least one member of the household had to be in SHG	•No control	O.1. Awareness score O.2. Practice score	•Significant increase in awareness and practice of airborne diseases (p<0.001) •Significant increase in awareness and practice of water-borne disease (p<0.001) •Significant increase in awareness and practice of vector-borne diseases (p<0.001) •Overall, average practice scores were lower than average awareness scores	L.1. Original design was cluster-randomized trial, but this study does not include a control group L.2. Small sample size	Low

Pronyk <i>et al.</i> (2006)	<ul style="list-style-type: none"> •Quasi-experimental •Longitudinal baseline and follow-up surveys 	<ul style="list-style-type: none"> •$n=8$ villages pair-matched and randomly allocated within pairs to receive intervention •3 cohorts of women aged 14-35 in each of the treatment and control communities •Cohort 1: women in micro-credit/education program ($n=843$, 90% and 84% follow-up in treatment and control) •Cohort 2: Household co-residents aged 14-35 years ($n=1455$; 75% and 71% follow-up) •Cohort 3: community residents aged 14-35 ($n=2858$; 58% and 63% follow-up) 	<ul style="list-style-type: none"> •Did not receive loans or education (would receive after 3 year study period) 	<ul style="list-style-type: none"> O.1. Experience of IPV in past year O.2. Unprotected sex with non-spousal partner in past year O.3. HIV incidence 	<ul style="list-style-type: none"> •Reduction (55%) in IPV for participants in integrated program •No impact on rate of unprotected sexual intercourse in young household residents of participants, or on HIV incidence in cohort 3 •Effect estimates for all measures of empowerment were positive for IG 	<ul style="list-style-type: none"> L.1. Small number of clusters (villages) L.2. Short duration of follow-up L.3. Self-selection L.4. Reporting bias for IPV or empowerment measures 	Moderate
Pronyk <i>et al.</i> (2008a)	<ul style="list-style-type: none"> •Quasi-experimental •Longitudinal baseline and follow-up surveys 	<ul style="list-style-type: none"> •$n=8$ villages pair-matched and randomly allocated within pairs to receive intervention •$n=426$ women aged 14-35 receiving the 	<ul style="list-style-type: none"> •Did not receive loans or education (would receive after 3 year study period) 	<ul style="list-style-type: none"> O.1. Social capital 	<ul style="list-style-type: none"> •Higher levels of structural and cognitive social capital in intervention groups, although the increases were not statistically significant after controlling for baseline measures 	<ul style="list-style-type: none"> L.1. Small number of clusters (villages) L.2. Some group differences at baseline L.3. Self-selection 	Moderate

		intervention • <i>n</i> =419 age and poverty matched controls • <i>n</i> =105 transcripts (FGDs, interviews, loan group observations)					
Pronyk <i>et al.</i> (2008b)	•Quasi-experimental •Longitudinal baseline and follow-up surveys	• <i>n</i> =8 villages pair-matched and randomly allocated within pairs to receive intervention • <i>n</i> =112 women aged 14-35 receiving the intervention • <i>n</i> =108 age and poverty matched controls • <i>n</i> =105 transcripts (FGDs, interviews, loan group observations)	•Did not receive loans or education (would receive after 3 year study period)	O.1. HIV risk behavior	•Participants had higher levels of HIV-related communication, were more likely to have accessed voluntary counseling and testing, and less likely to have had unprotected sex at last intercourse with non-spousal partner	L.1. Small number of clusters (villages), wide confidence intervals L.2. Short duration of follow-up L.3. Self-selection into program	Moderate
Roy <i>et al.</i> (2008)	•Quasi-experimental •Longitudinal baseline and follow-up surveys	• <i>n</i> =439 in intervention • <i>n</i> =421 in comparison • <i>n</i> =415 in control •Intervention group received nutrition training in conjunction with RMP training	•Comparison group received only RMP training •Control group received no training	O.1. Nutritional status O.2. Iodized salt intake O.3. Immunization s	•Mean net gain in weight for intervention group(+1,333 g) versus loss in weight for comparison (-147g) and controls (-277g) ($p<0.001$) •Increase in knowledge of how to use packaged salts for intervention group ($p<0.001$) •Increase in child vaccinations across all groups	L.1. Potential spillover of education component between participants and comparison group L.2. Self-selection into RMP	Moderate

Saha, Kermode, & Annear (2015)	<ul style="list-style-type: none"> •Quasi-experimental •Longitudinal baseline and follow-up surveys •Focus group discussions and key informant interviews 	<ul style="list-style-type: none"> •n=472 (219 from intervention; n=253 from comparison) •Respondents were women of reproductive age with children <2 years 	<ul style="list-style-type: none"> •Comparison villages were matched to microfinance programs but did not receive a health program 	<p>O.1. Diarrhea among children</p> <p>O.2. Institutional delivery of babies</p> <p>O.3. Colostrum feeding to newborns</p> <p>O.4. Having a toilet at home</p> <p>O.5. Money spent on treatment</p>	<ul style="list-style-type: none"> •Intervention group had higher odds of delivering in an institution (OR: 5.08, 95% CI 1.21-21.35) and feeding babies colostrum than control group (OR: 2.83, 95% CI 1.02-5.57). •Intervention group had greater odds of having a toilet after 1 year (% increase not significant) •No significant improvements in incidence of diarrhea or money spent on treatment 	<p>L.1. Village health workers may not have had enough training to be effective</p> <p>L.2. Short intervention period</p> <p>L.3. Potential spillover</p> <p>L.4. Self-selection</p>	Moderate
Seiber & Robinson (2007)	<ul style="list-style-type: none"> •Quasi-experimental •Cross-sectional baseline and follow-up surveys •Exit interviews with clients 	<ul style="list-style-type: none"> •n=29 clinics, 22 of which received loans •n=2387 clients 	<ul style="list-style-type: none"> •Private clinics not receiving loans 	<p>O.1. Client perceptions of service quality</p> <p>O.2. Expansion of services</p> <p>O.3. Sustainability of services</p>	<ul style="list-style-type: none"> •Perceived quality improved on 6 indicators among intervention clinics (vs. 2 at controls) (p<0.05) •Clients more likely to choose clinics based on drug availability, fair charges, cleanliness and confidentiality •Increased client flows •Mixed results for loyalty to clinic (found lower levels but may be attributable to new clients) 	<p>L.1. Non-random group assignment</p> <p>L.2. Does not use validated quality measures</p>	Moderate

Sherer <i>et al.</i> (2004)	<ul style="list-style-type: none"> •Non-experimental •Longitudinal (financial) and cross-sectional (health) baseline and follow-up surveys 	<ul style="list-style-type: none"> •<i>n</i>=68 in Malawi •<i>n</i>=277 in Thailand •<i>n</i>=208 in Guatemala •Intervention group consist of new MFI clients 	<ul style="list-style-type: none"> •Comparison condition = clients in a microfinance program for at least 1 year 	O.1. Household income O.2. Health knowledge O.3. Health service utilization	<ul style="list-style-type: none"> •Improvements in household income ranging from 22% to 64%; improvements in savings ranged from 20% to 42% (IG only) •Small but insignificant gains in health knowledge in all 3 countries •Significant increases in percentage of women seeking care for STI signs and for those who accessed primary care for child health 	L.1. No use of control group in analyses L.2. Basic analyses that do not control for confounding L.3. Self-selection	Very Low
Smith (2002)	<ul style="list-style-type: none"> •Quasi-experimental •Cross-sectional baseline and follow-up surveys 	<ul style="list-style-type: none"> •<i>n</i>=963 Ecuador •<i>n</i>=981 Honduras •Women aged 15-49 years with and without children <2 years 	<ul style="list-style-type: none"> •Comparison group are women at credit-only bank •Control group are women who are not members of either type of bank 	O.1. Expenditures O.2. Incidence of child diarrhea O.3. Breast feeding behavior O.4. Maternal health	<ul style="list-style-type: none"> •In both countries, health bank participation raised subsequent health care (specifically cancer screening) over credit only participation •In Honduras, health bank reduced conditional diarrhea •In Ecuador, found that village banking may lower conditional diarrhea probability, but adding a health tie-in does not have a further effect •Basically, no statistically significant effect on breastfeeding probabilities, either in banks only or all samples 	L.1. Non-random selection of communities with banks L.2. Self-selection of banking clients within community	Moderate

Spielberg <i>et al.</i> (2013)	<ul style="list-style-type: none"> •Cluster-randomized control trial •Longitudinal baseline and follow-up surveys 	<ul style="list-style-type: none"> •$n=55$ villages (32 intervention, 22 control) •$n=1368$ in intervention; $n=859$ in control at baseline •Respondents included females who were SHG members or their daughters/daughters-in-law 	•Control villages did not receive education after the introductory session	O.1. HIV knowledge O.2. HIV attitudes O.3. HIV behaviors O.4. Earning capacity	<ul style="list-style-type: none"> •Savings education did not have significant impact on earning and saving attitudes or behaviors at 12 months •Women and girls who attended LGGs had significantly higher levels of HIV knowledge, attitudes, and behaviors ($p<0.05$) •No significant effect on condom use (10% had used condoms in intervention group vs. 5% in control) 	L.1. Short 6 month intervention period insufficient to measure behavior change L.2. Differences in implementation by MFIs L.3. Self-selection	High
Ssewamala <i>et al.</i> (2012)	<ul style="list-style-type: none"> •Cluster-randomized control trial •Longitudinal surveys at baseline, 10-12 months, and 20-24 months 	<ul style="list-style-type: none"> •$n=138$ children in treatment •$n=148$ children in control •AIDS-orphaned children in the last 2 years of primary school 	•Usual care, including counseling and health education via national curriculum	O.1. Children's depressive symptoms	<ul style="list-style-type: none"> •Significant decrease in mean depressive symptoms for intervention group compared with control at 10 and 20 months ($p<0.001$) •Depression slopes were not statistically different between groups 	L.1. Baseline levels of depression were different across groups L.2. Unable to determine which component was most effective	High

Swenden <i>et al.</i> (2009)	<ul style="list-style-type: none"> •Quasi-experimental •Longitudinal surveys at 4 time points 	<ul style="list-style-type: none"> •$n=110$ intervention •$n=106$ control •2 stage random sampling 	<ul style="list-style-type: none"> • STD treatment, peer education, and condom promotion 	O.1. STD/HIV knowledge O.2. Sexual negotiation skills O.3. Social support O.4. Financial security	<ul style="list-style-type: none"> •Improved knowledge of STDs and condom protection; maintained STD/HIV risk perceptions despite treatment •Improved cognitive, behavior, and affective skills in sexual and work place negotiations (i.e. increased condom decision-making) •Increased social support among sex workers •Increased savings and alternative incomes for sex workers •Did not improve ability to take leave from work when sick; political participation; loan taking (focus on savings); working in other places 	L.1. Differential attrition between groups L.2. No validated empowerment measure used L.3. Intervention period insufficient to measure behavior change	Moderate
Tarozzi <i>et al.</i> (2014)	<ul style="list-style-type: none"> •Cluster-randomized control trial •Longitudinal baseline and follow-up surveys 	<ul style="list-style-type: none"> •$n=1844$ households •$n=141$ villages selected using stratified random sampling (47 each group) •$n=40$ new villages for cash study •$n=25$ early controls, $n=15$ new villages) 	<ul style="list-style-type: none"> •Comparison group received malaria information and were offered ITNs at no cost •Control group did not receive loans or malaria information •In follow-up cash study, IG paid cash for ITNs and CG received nothing. 	O.1. ITN ownership O.2. ITN usage O.3. Health status	<ul style="list-style-type: none"> •In IG, ITN acquisition was 52% (vs. 96% in comparison) ($p<0.001$); however, programmatically important that half of villages still purchased nets with loans. •Utilization rates increased for MF (9 pp) but more significantly for Free villages (38 pp). •Cash purchases in extended study were significantly lower 	L.1. Selection bias L.2. Cannot determine effect of distinct intervention components L.3. Seasonality of data, measurement error for incidence and prevalence	High

					(11%) than MF loan uptake (52%) (p<0.01) •Malaria prevalence higher in intervention communities (seasonality of data collection), though no significant difference. •Malaria incidence declined in Free (p<0.05) and MF (p<0.01) communities.		
Witte <i>et al.</i> (2015)	•Cluster-randomized control trial •Longitudinal surveys at 4 time points	•n=107 (57 in treatment, 50 in control) •Female sex workers at least 18 years or older	•HIV education only •Incremental group randomization	O.1. Unprotected sex acts O.2. Number of partners	•Intervention group experienced a 22% greater decrease in number of sexual partners than control group (p<0.001) •Overall decrease in unprotected sex acts across both groups, but IG had greater odds of reporting 0 sex acts at 6 months (p<0.05)	L.1. Small sample size L.2. Recall and social desirability bias L.3. Control group received far fewer education lessons; effect is due to microcredit or increased education?	Moderate

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