Evaluations of social safety-nets in Bangladesh and India

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Evaluations of Social Safety-nets in Bangladesh and India

Evaluaties van sociale vangnetten in Bangladesh en India

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Chapter 1
Introduction

Developing counties have established a number of social safety-net programmes to deal with various concerns. These programmes cover issues ranging from health, nutrition, education and job creation using public works and other approaches. Typically, such programmes focus on specific areas. For example, conditional cash transfer (CCT) programmes focus on providing cash transfers to reduce child labour and enhance human capital investments or for instance, the recognition that catastrophic healthcare expenditure is one of the most common factors in precipitating poverty has led to the implementation of a variety of health insurance schemes throughout the developing world (Acharya et al., 2013; Devadasan et al., 2006; Lu et al., 2012). Indeed, the push towards universal healthcare coverage (UHC) is providing further impetus to the development of health insurance schemes.

While not challenging the usefulness of programs that focus on a specific area, the last two decades have also seen the advent of integrated approaches to poverty alleviation in countries in South Asia and Africa (Misha et al., 2014; Paul, 2007; United Nations, 2008) providing multifaceted support in the form of asset-transfer, food-stipends, education, healthcare and social support for two years. Utilizing a four-round panel data spanning 9 years and combining regression and propensity score weighting, we evaluate CFPR\u2019s short and long term impact on income, employment, social status, food security and asset ownership. While remarkable effects of CFPR are evident in short and medium-term (up to 6 years since baseline. This is perhaps a useful approach, most notably for the ultra-poor who are typically precluded from traditional market based poverty alleviation approaches. In addition to income generation, these programmes integrate a number of additional components such as training and transfers related to health, education, nutrition and social mobilization. The fact that generally separates these approaches from traditional interventions is that as opposed to a one-off push, these programmes require participation over a certain duration over which the additional services are delivered. Though the scope, the targeted population and the components vary considerably, programmes such as these are gaining popularity and are being implemented across a number of developing countries (Banerjee et al., 2015).

Table 1.1: Overview of standard of living indicators of two countries studies in this thesis

	Year	Bangladesh	India
Income per capita (Current USD$)	*1995*	*320.4*	*381.5*
	2014	1092.7	1595.7
Life expectancy at birth (years)	*1995*	*63.0*	*60.0*
	2013	71.0	66.0
Mortality rate, under-5 (per 1,000 live births)	*1995*	*114.0*	*109.0*
	2014	40.0	50.0
Maternal mortality ratio (modeled estimate, per 100,000 live births)	*1990*	*440.0*	*460.0*
	2013	170.0	190.0
Female literacy rate (% of females ages 15-24)	*1990*	*38.0*	*49.0*
	2013	83.0	82.0
Underweight children (% of total)	*1995*	*58.0*	*41.4*
	2013	31.9	43.5
Health expenditure, public (% of total health expenditure)	*1995*	*36.2*	*27.0*
	2013	35.3	32.3
Out-of-pocket health expenditure (% of private expenditure on health)	*1995*	*96.1*	*91.4*
	2013	93.0	85.9
Improved sanitation facilities (% of population with access)	*1995*	*40.0*	*21.0*
	2014	60.0	40.0

Source: World Bank Open Data

This thesis evaluates two social safety-net programs implemented in South Asia. One of these focuses on a single area, health insurance, while the other is an integrated program. The first half of the thesis (Chapter 2 to 4) focuses on the evaluation of two health insurance schemes that have been implemented in India. The first is a Community Based Health Insurance (CBHI) scheme that provides coverage for both in and outpatient care. The second scheme is a high-profile national insurance scheme called *Rashtriya Swasthya Bima Yojana* (RSBY), implemented by the Government of India. The latter half of the thesis (Chapters 5 to 7) focuses on an ultra-poverty alleviation programme undertaken in Bangladesh called *Challenging the Frontiers of Poverty Reduction: Targeting the Ultra-poor* (CFPR:TUP). The programme uses an integrated approach to ultra-poverty alleviation through the provision of income generating assets and multifaceted training over a duration of two years.

1.1 Health insurance in India

Notwithstanding notable improvements in health indicators over the past decades, the provision of quality healthcare and access to financial protection remains a major concern. Although India boasts the 4th largest economy in the world, a third of the population still lives below the poverty line (World Bank, 2014). Private healthcare expenditures constitute 68% of total healthcare expenditure, of which more than 86% is paid out-of-pocket (OOP). Since only 15% of the population has access to financial protection (such as health insurance) from such expenditures, this exposes many households to hardship or causes them to forego care altogether (Bhandari et al., 2010; World Health Organization, 2012).

To fill this vacuum, Community Based Health Insurance schemes have been suggested as alternatives since the early 1990s. There are currently a number of such schemes operating across the country, each of which offers different benefit packages. Examples include the Yeshasvini CBHI programme in Karnataka which provides coverage for outpatient diagnosis, laboratory tests and inpatient surgical procedures, a scheme in Gudalur, Andhra Pradesh provides hospitalization coverage (Aggarwal, 2010; Devadasan et al., 2010), and a scheme in Maharashtra is restricted to providing consultation services through community health workers (Mahal et al., 2013)preventive products, and insurance. These factors motivated this intervention wherein a composite health-care package was delivered by a telemedicine-enabled community health worker (CHW. Each of these schemes targets different groups in rural India – Yeshasvini targets farmers belonging to a co-operative and informal sector workers; the CBHI in Gudalur targets indigenous (Adivasi) households while the scheme in Maharashtra targets low-skilled workers. The impact of such schemes on access to healthcare and financial protection is mixed. Furthermore, most of these studies rely on non-experimental approaches to evaluate the effects of the scheme and bias arising from self-selection into insurance remains a concern.

In contrast to the existing literature, the CBHI schemes investigated in this thesis have been rolled out and implemented so as to support an experimental evaluation of the effects of access to insurance on health care and financial protection. Three schemes were rolled out in locations in Uttar Pradesh and Bihar states of India and provide both inpatient and outpatient coverage to the participants. These locations were deliberately chosen as they are considered among the poorest in the country with the least education and large gender disparities (Planning Commission, 2011). The schemes differ from a

number of existing schemes operating in India in the sense that they are both managed and financed by the communities in which they operate. The schemes were rolled out among Self-Help Group (SHG) households. SHGs are groups of 10-20 women living in the same village who come together and agree to save a specific amount each period and are generally trained and supported by NGOs (Fouillet and Augsburg, 2008).

Prior to identifying the impact of the CBHI schemes, Chapter 2 of the thesis examines health seeking behaviour among the SHG households. Understanding local healthcare practices is crucial in designing benefit packages that effectively address the needs of the insured. The chapter estimates the probability of seeking out or inpatient care followed by modelling the likelihood of seeking care from specific providers, while distinguishing between demand and supply side related determinants.

Core objectives of an insurance scheme include facilitating access to care and alleviating the burden of healthcare expenses. Chapter 3 evaluates the impact of CBHI participation on access to care followed by measuring the magnitude of financial protection afforded to the insured for both out and inpatient care. The essay distinguishes itself from other literature in the field in two distinct ways. First, this is one of the first studies that utilizes a step-wise cluster randomized control trial (CRCT) to facilitate the evaluation. Second, the scheme evaluated is "stand alone" in the sense that it operates in the absence of financial or administrative support from the government.

Alongside private health insurance schemes such as the CBHI, several state-level publicly funded insurance schemes have also been in effect since the late 1990s. A number of issues however, led to the dissolution of most of these programmes (Prinja, Kaur, & Kumar, 2012; Balooni, Gangopadhyay, Turakhia, & Karthik, 2012; Sood et al., 2014; Results for Development Institute, 2010). Taking into account the shortfalls of previous endeavours, in 2008, the Government of India launched the RSBY, one of the largest social protection programmes in the country's history. The programme targets below-poverty-line (BPL) households and provides inpatient insurance coverage at a heavily subsidized rate. To date, the voluntary programme has been rolled out in 436 (of 479) targeted districts in all 29 states of the country, providing coverage to more than 37 million BPL households.

Chapter 4 provides a comprehensive assessment of the RSBY. Although a number of papers exist on the enrolment and impact aspect of the programme, they are primarily based on secondary district-level data. Additionally, there are no papers on factors that determine scheme retention. In this chapter, we first analyse household level determinants of enrolment using the same household level data as used in Chapter 2 and 3. Second, given membership renewals are an important benchmark of how RSBY's performance is deemed by participants, we analyse the determinants of dropping out of the scheme. Finally, we use a difference-in-differences approach to identify the impact of participating in the RSBY on healthcare use and financial protection.

1.2 Integrated approach to ultra-poverty alleviation in Bangladesh

Despite the impressive strides made in poverty reduction and the achievement of becoming a low-middle income country (from being a Least Developed Country), a third of the population still lives below $1.25/day. Similarly, although the number of people living in ultra-poverty ($0.60 to $0.70/day)

has decreased considerably between 2000 and 2010, it is still about 21 percent (Gimenez et al., 2013; National Institute of Population Research and Training (NIPORT) et al., 2013). The country reached a number of the Millennium Development Goals, including those related to reducing maternal and child mortality. However, despite these notable achievements, malnutrition remains a major contributor to child morbidity and mortality in Bangladesh (Rahman et al., 2009). Nearly 39% of children younger than 5 in rural Bangladesh are underweight while 28% of women report thinness (National Institute of Population Research and Training (NIPORT) et al., 2013).

In the absence of effective government-driven efforts to tackle poverty a vibrant NGO community has developed in the country. Bangladesh currently has nearly 2500 registered organization across the country focusing on improving the lives of the poor (Hamilton, 2015). One of the most popular tools so far has been microfinance. Despite its permeation, a number of prominent studies show that while the programme, is indeed useful in that it promotes entrepreneurship and brings many out of poverty, inclusion barriers preclude the participation of the ultra-poor (Hashemi and Rosenberg, 2006; Navajas et al., 2000).

BRAC, an international NGO launched the first phase of the CFPR programme in 2002 with the explicit intention of reaching the ultra-poor and pushing them out of ultra-poverty. Using a three-step targeting procedure to ensure the inclusion of the poorest and to prevent leakage, the CFPR requires participants to enrol for a period of two years during which time they are provided a productive asset base (typically in the form of livestock and poultry), continuous and intensive training sessions, both in-class and hands-on, on maintaining assets, a food subsidy, education, health, nutrition, and social and legal support.

A number of studies have confirmed the positive short-term effects of CFPR on participants' socioeconomic status measured through income and the type of employment (Rabbani et al., 2006), health and health related expenditures (Ahmed et al., 2007; Ahmed, 2006; Prakash and Rana, 2006) and food security (Ahmed and Rana, 2005; Haseen and Sulaiman, 2007; Prakash and Rana, 2006). Given the relative size of the push provided by the programme to the participants, in comparison to the participants' baseline status, the magnitude of the short-term gains are not unexpected. Given the broad scope of the CFPR and the particular importance attached to the health component, Chapter 5 first measures the short-term impact of the programme on the nutritional status of participant household members taking advantage of the randomized rollout. We subsequently investigate the spill-over effects on non-participants (both poor and non-poor). Similarly, we investigate the heterogeneity of impact across the sex of the household head followed by the sex of the individual. Lastly, we identify potential pathways of both the main effects and spill-over effects.

Chapter 6 evaluates the impact of the programme on explicitly targeted outcomes such as agricultural asset holdings (typically livestock and poultry) and financial market participation (microfinance participation, savings rates) in the medium-term (six years post-graduation). This is followed by the evaluation of implicitly targeted outcomes such as income, the likelihood of owning other income generating assets (e.g. rickshaws and cycle-vans) and landholdings.

One of the long-term goals of CFPR is to precipitate lasting changes in the employment trajectories of the participants, away from activities such as begging, working as maids and day-labouring to entrepreneurial activities. In Chapter 7, in addition to the outcomes investigated in Chapter 6, we

evaluate the long-term employment trajectories of the participants. As gender inequality is high on the policy agenda in Bangladesh and the impact of anti-poverty programmes has been linked to the gender of the main recipients (Berger, 1989), we investigate the heterogeneity of these trajectories across the gender of the household head and the baseline employment status.

Part I

Health Insurance

Chapter 2

Healthcare Seeking Behaviour among Self-help Group Households in Rural Bihar and Uttar Pradesh, India

In Collaboration with: Ellen van de Poel, Pradeep Panda, David Dror and Arjun Bedi

2.1 Introduction

Healthcare financing in India is still largely reliant on out of pocket spending (OOPS),[1] exposing many households to financial hardship or causing them to forego care altogether (Binnendijk et al., 2012; Bonu et al., 2009; Murray et al., 2012). Since 2008, the government has been offering inpatient coverage through a scheme called Rashtriya Swasthya Bima Yojana (RSBY) for those below the poverty line, but outpatient care, representing some 80 percent of total health expenditure, is generally still not included (Bhandari et al., 2010; Dror and Vellakkal, 2012). In the absence of other solutions to ease OOPS, a number of non-governmental organizations (NGOs) have introduced community-based health insurance (CBHI) schemes in rural India (Devadasan et al., 2006; Dror et al., 2007). These schemes have different benefit-packages, reflecting both different priorities within a demand-driven model, and unequal availability of services across rural locations.[2] Clearly, a good understanding of household healthcare seeking behaviour can inform how well such schemes respond to perceived priorities.

There is some evidence on determinants of health-seeking behaviour in urban settings in India (Das and Hammer, 2007; Das and Sanchez-Paramo, 2003; Das et al., 2012; Ergler et al., 2011; Gupta and Dasgupta, 1999; Levesque et al., 2006; Sudha et al., 2003). However, studies based on rural India are comparatively sparse. Ager and Pepper (2005)concern remains regarding the rates of utilization of state-provided services within Orissa. The reported study examined patterns of service utilization across the rural population of four districts of Orissa, with special reference to perceptions of the availability and quality of state services at the primary care level. Within the selected districts, 219 interviews were conducted across 66 villages. Households reported utilizing a wide range of health care providers, although hospitals constituted the most frequently--and primary health care centres (PHCs reported that in 1996 primary healthcare centres were relatively underused in rural Odisha and that households preferred (qualified and unqualified) private providers.[3] They reported that reputation of provider, cost and ease of access were important in influencing provider choice. Using data from India's National Sample Survey Organisation (NSSO), Borah (2006)a better understanding of the individual provider choice decision is required. This paper is an attempt in this direction as it investigates the determinants of outpatient health care provider choice in rural India in the mixed multinomial logit (MMNL and Sarma (2003) found that the demand for healthcare in rural areas is negatively affected by the price of healthcare and distance to a healthcare facility. They concluded that poorer households were more price-sensitive, with higher elasticity of demand in seeking care for children than for adults. Gautham, et al. (2011)the present study sought to collect descriptive evidence on 1 st contact curative health care

[1] Private expenditure constitutes 81 percent of total health expenditure in India of which 94 percent is out-of-pocket expenditure (Bhandari et al., 2010). Less than 15 percent of the population is covered by health insurance (Bhandari et al., 2010; World Health Organization, 2012).

[2] There are a number of schemes operating across the country, each of which offers different benefit packages. Examples include the Yeshasvini CBHI programme in Karnataka which provides coverage for outpatient diagnosis, laboratory tests and inpatient surgical procedures, a scheme in Gudalur, Andhra Pradesh provides only hospitalization coverage (Aggarwal, 2010; Devadasan et al., 2010), and a scheme in Maharashtra is restricted to providing consultation services through community health workers (Mahal et al., 2013). Each of these schemes targets different groups in rural India – Yeshasvini targets farmers belonging to a co-operative and informal sector workers; the CBHI in Gudalur targets indigenous (Adivasi) households while the scheme in Maharashtra targets low-skilled workers.

[3] Unqualified or less than fully qualified practitioners are referred to by a variety of designations: rural medical practitioners (RMPs), local medical providers, non-degree allopathic providers or somewhat informally as "quacks" (De Costa and Diwan, 2007).

seeking choices among rural communities in two States of India - Andhra Pradesh (AP, using data from household surveys, key informant interviews and focus group discussions, found that the majority (92%) of respondents in Andhra Pradesh visited private providers, of which 75 percent visited non-degree allopathic providers (NDAP); and in Odisha, 53 percent of respondents sought allopathic care, of which about 76 percent were NDAP. The main reasons for such choices were providers' proximity, and their readiness to make home visits when needed.

The main objective of this paper is to examine and understand healthcare seeking behaviour with a view to drawing lessons on the design of benefit packages offered through CBHI schemes. In particular, this paper provides evidence on the healthcare seeking behaviour of a specific but important group in rural India, namely households affiliated to self-help groups (SHG). The study was carried out against the backdrop of the introduction of CBHI schemes, implemented by local NGOs, which were going to offer insurance to households where at least one member was affiliated to a self-help group in March 2010 (see Doyle et al., (2011) for further details). The study draws on baseline surveys which were conducted a year prior to scheme launch and focuses on rural Uttar Pradesh and Bihar, two of India's most populated, poorest and least urbanized states, with large gender differences.[4] As SHG households are typically poorer and less educated than the general population our analysis sheds light on the healthcare seeking behaviour of a relatively marginalized population in rural India (Panda et al., 2014).[5]

We begin the analysis by estimating the probability of seeking any out or inpatient care. Second, we model the probability of seeking care from a specific provider, while distinguishing between patient and provider characteristics. Third, our analysis distinguishes between care sought for acute and chronic conditions, between outpatient and inpatient care, and we examine the probability of seeking care from a wider range of providers.

The paper is organized as follows: the methods (data and analytical techniques) are described in section 2, followed by results in section 3. Section 4 contains a discussion and concluding remarks.

2.1 Methods

2.2.1 Data and Specification

The data used in this paper is drawn from household surveys conducted between March and May 2010 in *Kanpur Dehat* and *Pratapgarh* districts in Uttar Pradesh and in *Vaishali* district in Bihar.[6] As mentioned above, these baseline surveys preceded the implementation of three CBHI schemes which offered insurance to targeted households.[7] The target group consisted of 3,686 SHG households (1284

[4] The surveys were designed to provide a better understanding of the healthcare needs among the targeted group such that the benefit package could be tailored to meet local needs.

[5] A self-help group (SHG) usually consists of between 10-20 poor women living in the same village who come together and agree to save a specific amount each period. The savings of all SHG members are combined and deposited in a bank or a co-operative organization. Members may borrow from the pooled savings when the SHG agrees to give the loans. SHGs are usually supported and trained by NGOs. According to Fouillet, Augsburg [40] there are about 40 million SHG members in India.

[6] These districts were purposively selected as the NGOs offering the CBHI insurance scheme had an established network of self-help groups in these three districts.

[7] Project details can be found at http://www.microinsuranceacademy.org/content/developing-efficient-responsive-community-based-health-insurance-cbhi-india and in Doyle, Panda et al. (2011).

in Pratapgarh, 1039 in Kanpur Dehat and 1363 in Vaishali) representing 21,366 individuals. All targeted households were surveyed. The primary respondents were the SHG members themselves or the head of the household, if the member was unavailable. Information on other household members was collected from the primary respondents.[8]

While the survey gathered information on a wide range of socio-demographic and economic characteristics, of particular interest is the detailed information collected on health status, self-reported symptoms experienced during the four weeks preceding the survey for outpatient care and one year for inpatient care, and choice of provider. Respondents who reported an illness were asked whether they sought care, and if so, from which type of provider. Data pertaining to the following pre-selected providers were collected: traditional healers, priests, pharmacists, NDAPs, nurses, qualified private doctors, qualified public doctors, specialist public doctors, specialist private doctors and 'others'.[9]
Outpatient episodes were separated into acute or chronic.[10] For chronic illnesses, information was gathered on the most recent visit; for acute illnesses, information was gathered for up to three illnesses and three visits per illness in the four weeks preceding the survey. While we have data on multiple illnesses and multiple visits, the analysis deals mainly with choice of healthcare provider for the first illness and the first visit, as most individuals (98%) experienced only a single illness during the four-week period. While there are repeat-visits for the same illness, the number of cases is not as large as the first visit and perhaps more importantly, as will be discussed later, the choice of provider does not vary substantially in subsequent visits. In the case of inpatient care the survey enquired whether any household member had been hospitalized in the 12 months preceding the survey.

Consistent with the existing literature, the probability of healthcare use and the choice of provider are modelled as functions of individual and household level covariates (Borah, 2006; Sahn et al., 2003; Sarma, 2003). The individual characteristics include the respondent's demographics, educational attainment, occupational status and self-reported health status. For models related to acute illnesses, we use the socioeconomic characteristics of the household head, since a substantial proportion of the sample consists of children (41%). We control for the nature of the respondent's illness by including a set of self-reported symptom variables and health status is measured by the generic quality of life variable (EQ5D) which contains information on five dimensions of health: mobility, self-care, pain, ability to perform usual activities and mental health status. The scores from each question are converted into an index that is increasing in health and ranges between -1 to +1 using the procedure suggested by Dolan (1997). As these questions were administered only to individuals older than 12 years, the EQ5D measure is only used while modelling the probability of obtaining care for chronic conditions which is estimated only for respondents older than 12. Household level covariates include household size

[8] For all survey instruments, ethical approval was acquired from the independent ethics committee of the University of Cologne. Informed consent was taken prior to each interview, and respondents were free to halt the interview at any time, or to refuse to answer questions.

[9] Qualified private doctors and specialists have been grouped together and are henceforth referred to as private doctors. Similarly, qualified public doctors and specialists have been grouped together and are referred to as public doctors. Due to the small number of observations, traditional healers, priests and nurses have been grouped together and form part of the 'other' category. We have also clubbed trained AYUSH (Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homoeopathy) doctors in category "other" as only 2 of 4184 respondents who reported an illness sought care from an AYUSH doctor.

[10] Chronic illnesses are defined as conditions that are reported to have been ongoing for 30 days or more.

and gender of the household head, whether a household belongs to a scheduled tribe or caste and household socioeconomic status as captured by (the log of) per capita consumption.[11]

2.2.2 Analytical technique

The probabilities of using acute and chronic outpatient care, and inpatient care, are modelled using probit specifications. We consider the probability of using outpatient care conditional on reporting an illness while for the probability of inpatient care we use the full sample.

To model the choice of healthcare provider for outpatient care, we use an alternative-specific conditional logit model (McFadden, 1974). This has the advantage of allowing both individual and provider level characteristics to influence the choice of healthcare provider (Borah, 2006; Erlyana et al., 2011; Qian et al., 2009) and does not require arbitrary choices as in the case of a nested logit model (Brown and Theoharides, 2009; Chawla and Ellis, 2000; Dor et al., 1987). The probability that individual *i* chooses healthcare provider *j* (out of a set of *m* providers) can then be written as:

$$P_{ij} = \frac{\exp(x_{ij}'\beta + z_i'\gamma_j)}{\sum_{l=1}^{m} \exp(x_{il}'\beta + z_i'\gamma l)}, \; j = 1, ..., m \qquad (1)$$

where x_{ij} are healthcare provider specific regressors and z_i are individual specific regressors.

Since respondents only report information such as cost and travel time for the providers they actually visit, following established practice (Borah, 2006; McFadden and Train, 2000; Qian et al., 2009), we impute costs and time faced by each individual and for each provider.[12] We estimate a log linear model on the sample of users (using individual, household covariates and village indicator variables) and subsequently predict costs and travel time for the entire sample.[13] To ease interpretation of coefficients, we calculate marginal effects for the alternative specific variables as:

$$\frac{\delta p_{ij}}{\delta x_{ik}} = p_{ij}(1 - p_{ij})\beta \qquad (2)$$

Since we use the logarithm of costs and travel time in our models, the marginal effects for these two variables is interpreted as the change in the probability of choosing healthcare provider *j* due to a 1 percent increase in costs or travel time. All analysis was done using STATA version 12.0.

[11] Information on household consumption is self-reported and based on a 30-day recall period for store bought and home grown food items and a 12 month recall period for household durables and investments in agricultural equipment. This is then divided by the household size to arrive at the figure.

[12] This study considers direct costs of care that relate to consultation fees, medicines, lab and imaging tests.

[13] While we follow accepted practice, it is likely that this approach underestimates variation in costs and travel time that may be experienced by those who did not use care.

2.3 Results

2. 3.1 Summary statistics

Table 2.1 shows summary statistics for the full sample, and separately for the three different sites. Half of the adult respondents are women while children younger than 13 years account for 37 percent of the sample. The average household size is 6.8. About 37 percent of household heads have no education while 11 percent have higher secondary education. As for employment, 34 percent of the household heads are self-employed in agriculture followed by 26 percent who work as casual wage labourers. Thirty percent of the sample may be classified as scheduled caste or tribe (SC/ST).[14] The average annual per capita consumption is INR 13,588.[15] While there are differences across the three sites in aspects such as the percentage of female headed households and occupational status of household head, differences are minimal for household size, self-assessed health status, educational attainment, share of SC/ST, and annual per capita expenditures.

Table 2.1: Description and means of covariates

Variable	Means			
	Pooled	Kanpur Dehat	Pratapgarh	Vaishali
Demographics				
Female headed household (1/0)	0.19	0.09	0.19	0.21
Female children 0-13 (1/0)	0.18	0.15	0.16	0.20
Female aged 14-55 years (1/0)	0.29	0.27	0.31	0.27
Female older than 55 years (1/0)	0.04	0.06	0.04	0.05
Male aged 0-13 years (1/0)	0.19	0.16	0.19	0.21
Male aged 14-55 years (1/0)	0.26	0.31	0.26	0.23
Male older than 55 years (1/0)	0.04	0.05	0.04	0.04
Household size	6.77	6.94	7.28	6.10
	(2.75)	(2.64)	(3.22)	(2.07)
Self-assessed health measure (EQ5D) increasing in health (-1 to +1)	0.76	0.77	0.79	0.72
Education (respondent)				
No education (1/0)	0.38	0.33	0.35	0.44
Primary education (1/0)	0.26	0.24	0.26	0.28
Secondary education (1/0)	0.28	0.33	0.30	0.23
Higher secondary education (1/0)	0.08	0.10	0.09	0.05

[14] This is a higher proportion than the state rural SC/ST averages (nearly 17 per cent in Bihar and 23 per cent in Uttar Pradesh).

[15] PPP$1 = INR 18.073 for 2010. A comparison between SHG affiliated households and randomly selected non-SHG affiliated households in the same location shows that the monthly per capita expenditure and educational attainment of SHG members was about 6% and 7% lower than the comparison group.

Table 2.1: *(Continued)*

Variable	Means			
	Pooled	Kanpur Dehat	Pratapgarh	Vaishali
Education of household head				
No education (1/0)	0.37	0.31	0.33	0.46
Primary education (1/0)	0.17	0.14	0.19	0.17
Secondary education (1/0)	0.35	0.40	0.37	0.28
Higher secondary education (1/0)	0.11	0.15	0.11	0.09
Socioeconomic Status				
Annual per capita expenditure (Indian Rupees [INR])(17329)	13588 (25338)	15922 (10095)	11368 (14688)	13961
Household belongs to a scheduled tribe/caste (1/0)	0.30	0.28	0.33	0.29
Occupation (respondent)				
Self-employed in agriculture (1/0)	0.11	0.19	0.07	0.07
Self-employed in non-agriculture (1/0)	0.04	0.03	0.05	0.06
Other employment (1/0)	0.02	0.02	0.04	0.02
Casual wage labourer (1/0)	0.09	0.05	0.09	0.11
Not working (1/0)	0.06	0.05	0.07	0.04
Doing housework (1/0)	0.20	0.21	0.20	0.19
Student (1/0)	0.48	0.45	0.48	0.51
Occupation of household head				
Self-employed in agriculture (1/0)	0.34	0.63	0.22	0.21
Self-employed in non-agriculture (1/0)	0.14	0.07	0.17	0.18
Other employment (1/0)	0.07	0.03	0.12	0.05
Casual wage laborer (1/0)	0.26	0.13	0.29	0.35
Not working (1/0)	0.07	0.05	0.11	0.04
Doing housework (1/0)	0.12	0.09	0.09	0.17
Student (1/0)	0.00	0.00	0.00	0.00
Location				
Household located in Kanpur Dehat (1/0)	0.29			
Household located in Pratapgarh (1/0)	0.37			
Household located in Vaishali (1/0)	0.34			

Notes: Underlined categories are used as reference categories in the regression models. The health status indicator EQ5D only pertains to those above the age of 12. Standard deviation provided in parentheses for continuous variables. [*Observations: 21,366*]

2.3.2 Disease Burden and Healthcare Seeking Behaviour

Table 2.2 shows the distribution of self-reported symptoms for both acute and chronic conditions. Approximately 20% and 15% of individuals report acute and chronic symptoms, respectively (see

Figure 2.1).[16] Over half (52%) of the acute conditions relate to gastrointestinal symptoms (diarrhoea and cholera), followed by respiratory symptoms (20%). While symptoms related to chronic conditions were more difficult to classify, 27 percent were grouped into the 'other' category, followed by musculoskeletal symptoms (23%), lung/respiratory symptoms (15%) and gastrointestinal symptoms (15%). Ten percent of the sample reports having persistent allergies or infections.

Table 2.2: Distribution of self-reported symptoms for acute and chronic conditions

	Category	Means			
		Pooled	Kanpur Dehat	Pratapgarh	Vaishali
Acute (N=4171)	Gastrointestinal symptoms (1/0)	0.52	0.57	0.56	0.46
	Febrile symptoms (1/0)	0.08	0.06	0.05	0.14
	Lungs/respiratory symptoms (1/0)	0.20	0.15	0.21	0.22
	Musculoskeletal symptoms (1/0)	0.04	0.03	0.05	0.03
	Other symptoms (1/0)	0.16	0.19	0.13	0.15
Chronic (N=3277)	Lungs/respiratory symptoms (1/0)	0.15	0.17	0.09	0.21
	Gastrointestinal symptoms (1/0)	0.15	0.13	0.14	0.19
	Musculoskeletal symptoms (1/0)	0.24	0.20	0.35	0.09
	Chronic allergies/infections (1/0)	0.10	0.08	0.09	0.14
	Other symptoms (1/0)	0.27	0.33	0.24	0.28
	Internal symptoms (1/0)	0.09	0.09	0.10	0.09

Notes: Underlined categories are used as reference categories in the regression models. Chronic conditions exclude children younger than 13 years of age.

Figure 2.1 displays the pattern of healthcare seeking behaviour in the sample (see Annex ' for site level details). There are several notable points emerging from the figure. The majority of individuals do seek care for both acute (86%) and chronic illnesses (70%). Of those who seek care for acute illnesses, only 8 percent visit qualified doctors/specialists at public health facilities while the rest seek care from private practitioners. NDAPs account for 56 percent of visits while qualified doctors/specialists in private practice account for 23 percent of the visits, followed by pharmacists (11%). For chronic illnesses the private sector dominates (83 percent of healthcare visits). Qualified private doctors/specialists and NDAPs are responsible for a substantial proportion of care (39% and 30% respectively) followed by pharmacists (14%). With regard to inpatient care, once again private care (nursing homes and private hospitals) dominates and accounts for 78 percent of visits followed by public hospitals (15%) and other public providers (7%). Figure 2.2 displays healthcare seeking behaviour for second visits in the case of acute illnesses. The main point emerging from the figure is that individuals tend to use the same provider a

[16] The surveys were implemented during the low morbidity season and it is possible that the incidence of reported illnesses is understated. In this part of rural India, the maximum burden of disease occurs during the monsoon season – May to July (see Kumari et al., (2012)).

second time. For instance of the 1,991 individuals who visited NDAPs, 629 (29 percent) report a second visit of which 91 percent visit an NDAP. In the case of those who visited private providers, 35 percent report a second visit of which 72 percent visit a private provider the second time around.

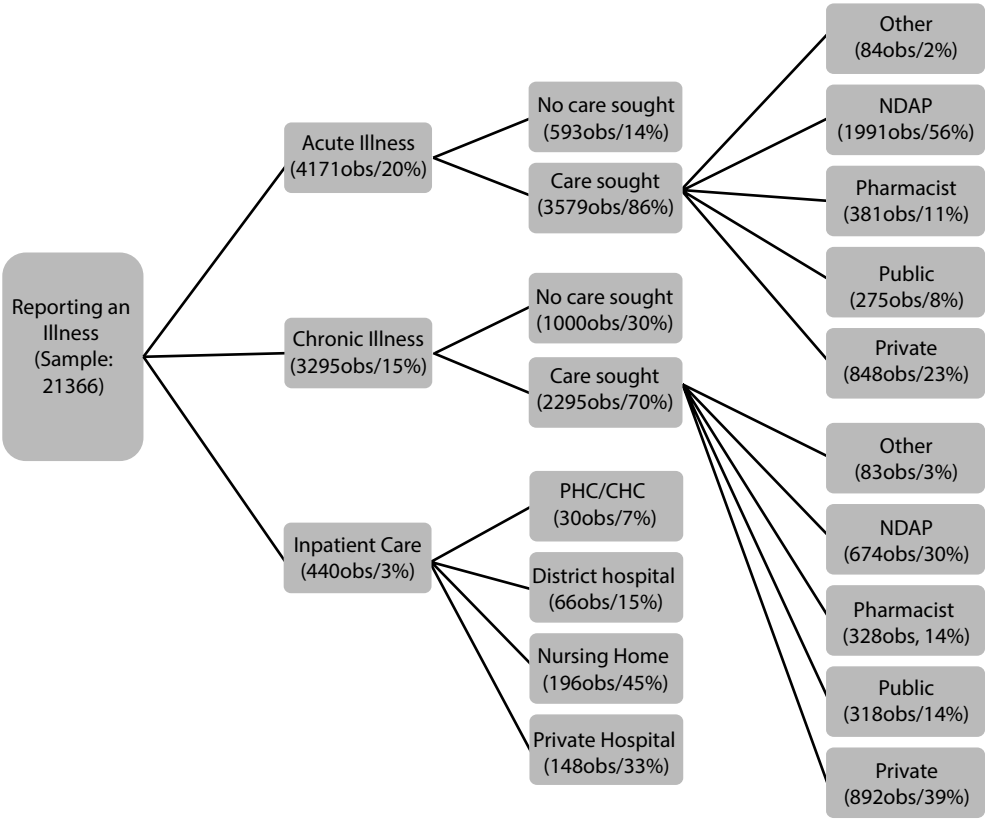

Figure 2.1: Health seeking behaviour in the sample

Note: The sample for chronic illnesses and inpatient care exclude children younger than 13 years of age.

2.3.3 Determinants of seeking care conditional upon reporting illness

Table 2.3 contains estimates of the probability of seeking outpatient care for acute (column 1), chronic illnesses (column 2), and inpatient care (column 3). Several points emerge from these probit estimates. Across all three specifications, for the most part, employment status and whether an individual belongs to the SC/ST groups do not have much of a bearing on the probability of seeking care. However, socioeconomic status as reflected by annual per capita household expenditure is positively correlated with the probability of seeking care. A one percent increase in expenditure is associated with a four percentage point (pp) increase in the probability of seeking care in case of an acute illness. The effect for chronic illnesses is stronger (seven percentage point effect) while for inpatient care the effect is much smaller, perhaps reflecting the necessity of such care. Reflecting ease of access to at least some form

of medical care, educational attainment is not correlated with the probability of seeking care for acute illnesses. However, those with higher educational levels (higher secondary education) are substantially (13 pp) more likely to seek care for chronic illnesses. In the case of acute illnesses there are clear gender differences. Male children (0-13 years) and working age men (14-55 years) are more likely to be treated for acute conditions compared to adult females (5 and 6 percentage points respectively). Female children are also more likely to receive care compared to adult females in the age group 14 to 55. Respondents in Pratapgarh and Kanpur Dehat are substantially less likely to seek outpatient care compared to those in Vaishali. This may be due to the greater proximity of healthcare providers in Vaishali versus the other two sites. The health status of an individual has an expected sign, namely those in better health are less likely to seek care.

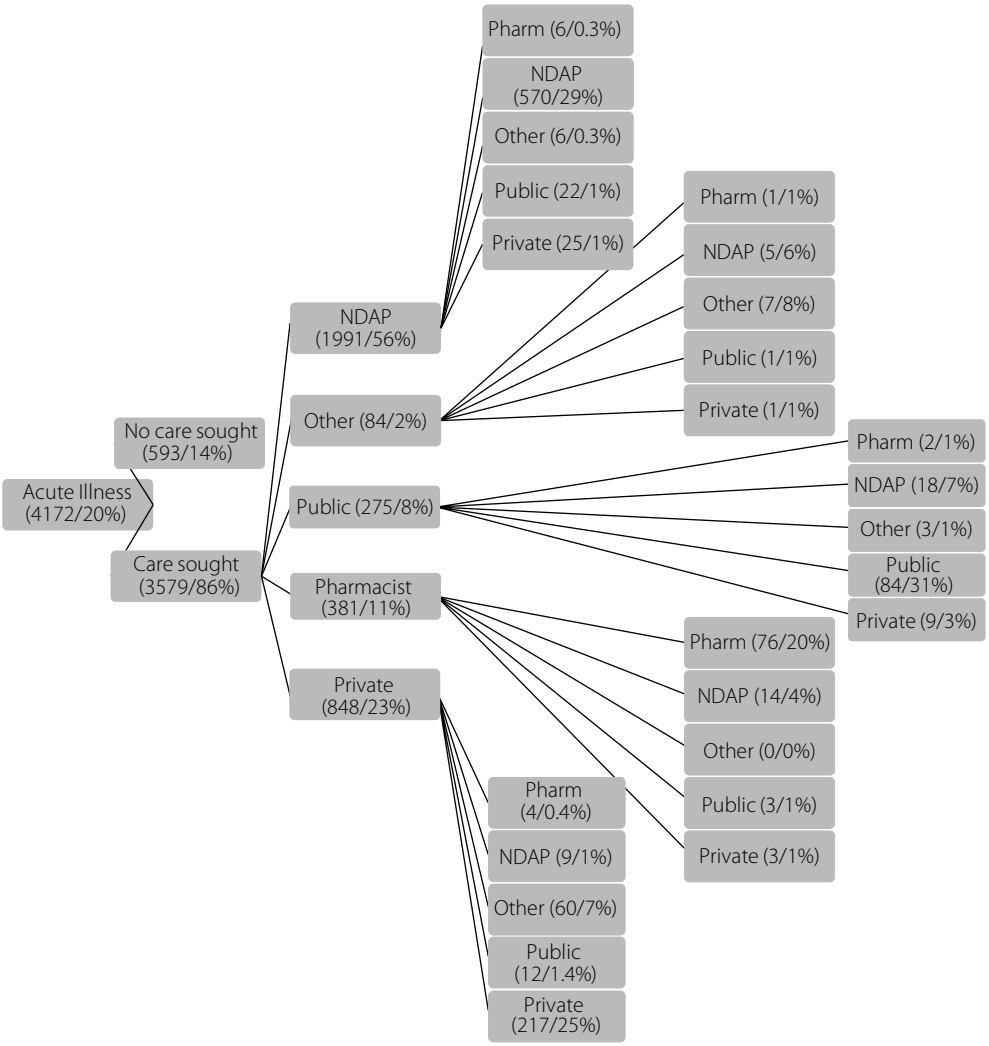

Figure 2.2: Health seeking behaviour for those suffering from an acute illness (first and second visit)

Table 2.3: Determinants of the probability of seeking outpatient care for acute and chronic conditions and of seeking inpatient care

Variable	Acute Illness (1)		Chronic Illness (2)		Inpatient Care (3)	
	Marginal effects	Standard error	Marginal effects	Standard error	Marginal effects	Standard error
Female headed household (1/0)	0.002	0.018	-0.033*	0.018	-0.000	0.003
Female children 0-13 (1/0)	0.035**	0.015				
Female older than 55 years (1/0)	0.012	0.026	0.016	0.024	-0.011**	0.005
Male aged 0-13 years (1/0)	0.050***	0.015				
Male aged 14-55 years (1/0)	0.060***	0.015	-0.017	0.021	-0.006*	0.003
Male older than 55 years (1/0)	0.042	0.033	0.012	0.026	-0.010**	0.005
Log of household size	0.058***	0.017	0.107***	0.020	-0.003	0.003
Primary education (1/0)	0.017	0.017	0.026	0.021	0.007*	0.003
Secondary education (1/0)	-0.016	0.013	-0.003	0.019	0.005*	0.003
Higher secondary education (1/0)	0.022	0.020	0.131***	0.031	0.004	0.004
Natural log of annual per capita expenditure (INR)	0.037***	0.013	0.069***	0.019	0.005*	0.003
Scheduled caste/tribe (1/0)	-0.004	0.012	-0.008	0.015	-0.001	0.003
Self-employed in non-agriculture (1/0)	0.002	0.018	0.041	0.032	-0.005	0.005
Other employment (1/0)	-0.066***	0.022	0.080**	0.038	0.005	0.006
Casual wage labourer (1/0)	-0.017	0.015	0.003	0.026	0.003	0.004
Not working (1/0)	-0.033	0.022	-0.015	0.027	0.000	0.005
Doing housework (1/0)	-0.011	0.022	0.001	0.022	0.000	0.004
Student (1/0)			-0.033	0.031		
Kanpur Dehat	-0.098***	0.015	-0.087***	0.019	-0.006**	0.003
Pratapgarh	-0.029**	0.014	-0.101***	0.017	-0.007***	0.003
Acute gastrointestinal symptoms (1/0)	-0.032**	0.015				
Acute febrile symptoms (1/0)	-0.093***	0.022				

Table 2.3: *(Continued)*

Variable	Acute Illness (1)		Chronic Illness (2)		Inpatient Care (3)	
	Marginal effects	Standard error	Marginal effects	Standard error	Marginal effects	Standard error
Acute musculoskeletal symptoms (1/0)	-0.136***	0.026				
Other acute symptoms (1/0)	-0.020	0.019				
Self-assessed health measure Increasing in health (-1 to +1)			-0.150***	0.024	-0.049***	0.004
Chronic lungs/respiratory symptoms (1/0)			0.043*	0.023		
Chronic gastrointestinal symptoms (1/0) (1/0)			0.061***	0.023		
Chronic allergic symptoms (1/0)			-0.004	0.026		
Other chronic symptoms (1/0)			0.008	0.019		
Chronic symptoms related to Internal organs (1/0)			0.021	0.027		
Observations	*4,171*		*3,276*		*13,965*	

Notes: The table provides marginal effects based on probit models. Models for outpatient care are estimated over the sample of respondents that reported an illness. The sample for chronic illnesses and inpatient care exclude children younger than 13 years of age. The employment and occupation variables refer to the employment and occupation of the household head. *, **, *** indicate significance at the 10%, 5% and 1% respectively.

2.3.4 Determinants of choice of provider

Figure 2.3 shows the main reasons provided by respondents for choosing a specific healthcare provider (Figure 2.3A for acute, 2.3B for chronic conditions and 2.3C for inpatient care respectively). In the case of acute illnesses, NDAPs dominate and the main reason for visiting them is their proximity (60 per cent), followed by the view that they are the best providers (23 per cent) while cost considerations are not as important (10 per cent). Those who visit private hospitals point out that the main reason for visiting them is that they are considered the best providers of care (50 per cent) followed by proximity. With regard to chronic conditions, qualified doctors/specialists in private practice dominate as they are considered as best by the care-seekers (58 percent). The reason for visiting NDAPs is their proximity. Disaggregated results by site reveal similar patterns (see Annex Table 2.2).

Before modelling health provider choice, we estimated travel time and average costs for providers across sites, both for acute and chronic conditions (Annex Table 2.3). Across all three sites the closest providers are NDAPs followed by pharmacists (17 and 19 minutes travel time, respectively). On average, qualified public and private providers are about 40 minutes away. Across the three locations Vaishali seems to have the greatest concentration of access to healthcare facilities. On average, NDAPs are only 9 minutes away in Vaishali as compared to 18 and 24 minutes in Pratapgarh and Kanpur Dehat respectively. Similarly, it takes about 32 minutes to access qualified doctors in Vaishali as compared to 54-56 minutes in Kanpur Dehat.

With regard to the costs of treatment, there are marked differences across acute and chronic conditions. Regardless of the provider, the cost of care is higher for treating chronic conditions compared to acute illnesses. We find that pharmacists are the cheapest amongst the various providers for both acute and chronic illnesses (INR 69 and INR 154 respectively), followed by NDAPs (INR 128 and INR 246 respectively), public doctors (INR 155 and INR 570 respectively) and private doctors (INR 380 and INR 929 respectively).

Table 2.4 shows odds ratios (OR) based on a conditional logit model for choice of outpatient care for acute conditions (reference category: public healthcare providers). Children, either male or female, are more likely to receive care from private doctors or NDAPs. There is some evidence that higher education is associated with the use of greater care from private providers. For instance, households headed by heads that have secondary education are more likely to use private care (OR – 1.7) and individuals living in households where heads have higher secondary education are less likely to visit NDAPs (OR – 0.65). Patients living in households with higher per capita annual expenditure are less likely to forego care and also less likely to visit other providers. Belonging to a SC/ST group has no bearing on provider choice. Consistent with the differences in availability of care, respondents living in Kanpur Dehat are more likely to forego care while households in Pratapgarh are far more likely to use public care as compared to other providers.

Figure A: Reasons for choosing provider for Acute Illnesses

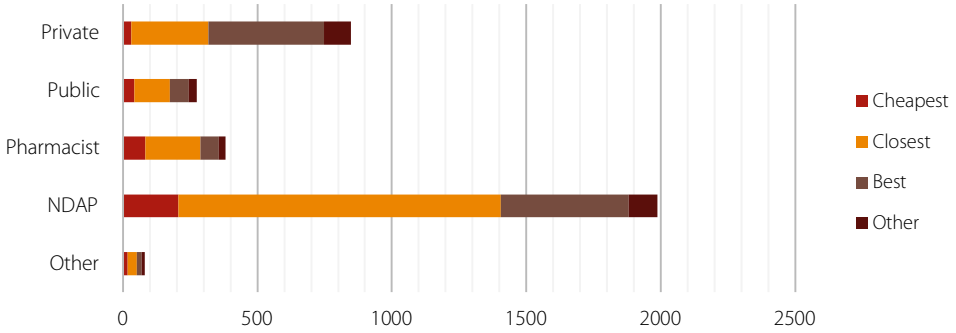

Figure B: Reasons for choosing provider for Chronic Illnesses

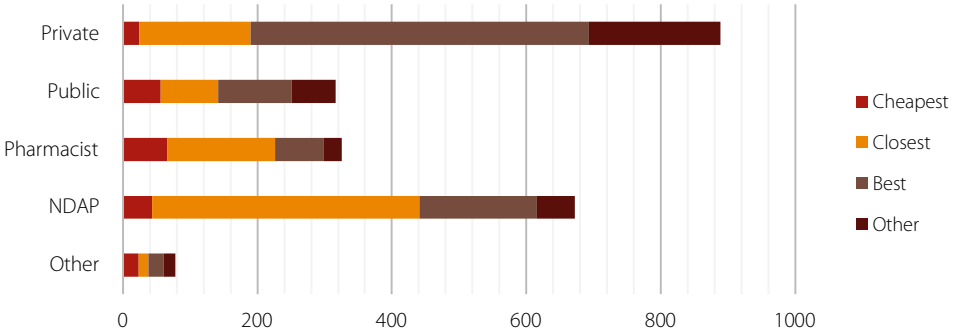

Figure C: Reasons for choosing provider for inpatient care

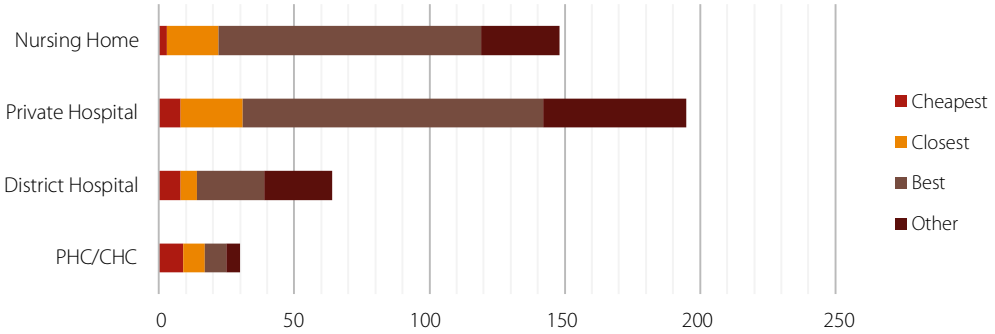

Figure 2.3: Self-reported reasons for choosing a healthcare provider for acute, chronic and inpatient conditions

Notes: Each figure for acute, chronic and inpatient care represents the number of cases (3573, 2280 and 437 respectively) reported. The sample for chronic illnesses and inpatient care exclude children younger than 13 years of age. Responses are not mutually exclusive.

Table 2.4: Determinants of provider choice for outpatient care for acute conditions

Variable	None		Other		Pharmacist		Private		NDAP	
	Odds ratio	Standard error	Odds ratio	Standard error	Odds ratio	Standard error	Odds ratio	Standard error	Odds ratio	Standard error
Female headed household (1/0)	1.336	0.348	3.054***	1.233	1.215	0.339	1.414	0.356	1.435	0.335
Female children 0-13 (1/0)	1.382	0.413	2.016	1.123	1.32	0.417	2.308***	0.672	1.861**	0.487
Female older than 55 years (1/0)	1.104	0.437	1.427	0.877	1.311	0.565	1.346	0.522	1.215	0.439
Male aged 0-13 years (1/0)	1.087	0.31	2.875**	1.535	0.865	0.264	2.200***	0.605	1.673**	0.412
Male aged 14-55 years (1/0)	0.742	0.158	1.191	0.472	1.321	0.295	1.411*	0.283	1.175	0.218
Male older than 55 years (1/0)	0.78	0.358	2.794*	1.697	1.009	0.509	1.064	0.467	1.152	0.465
Log of household size	0.540***	0.124	0.555	0.232	0.614*	0.153	0.938	0.201	0.954	0.19
Primary education (1/0)	0.859	0.195	0.292**	0.142	0.841	0.204	1.064	0.228	1.11	0.216
Secondary education (1/0)	1.517**	0.295	1.005	0.351	1.149	0.242	1.694***	0.317	1.264	0.219
Higher secondary education (1/0)	0.707	0.187	0.912	0.502	0.937	0.259	1.371	0.332	0.654*	0.149
Log of annual per capita exp. (INR)	0.650**	0.117	0.462**	0.164	0.78	0.155	0.963	0.156	0.909	0.14
Scheduled caste/tribe (1/0)	1.129	0.188	0.659	0.2	1.042	0.188	0.91	0.147	1.209	0.178
Self-employed in non-agriculture (1/0)	1.19	0.303	1.139	0.479	1.867**	0.483	1.540*	0.363	0.967	0.212
Other employment (1/0)	1.662*	0.467	0.819	0.443	1.473	0.441	1.115	0.308	0.738	0.186
Casual wage labourer (1/0)	1.369	0.296	1.231	0.483	1.155	0.271	1.486*	0.305	1.128	0.213
Not working (1/0)	1.953**	0.635	0.825	0.646	1.071	0.404	2.115**	0.666	1.375	0.398
Doing housework (1/0)	0.945	0.305	0.605	0.318	0.841	0.297	1.157	0.358	0.784	0.225
Student (1/0)	0.752	0.183	0.476	0.226	1.007	0.257	0.606**	0.143	0.818	0.172
Kanpur Dehat	1.992***	0.458	1.181	0.413	0.420***	0.11	0.653*	0.143	1.261	0.263
Pratapgarh	0.435***	0.087	0.203***	0.072	0.408***	0.082	0.193***	0.036	0.389***	0.068
Acute gastrointestinal symptoms (1/0)	1.446*	0.296	1.621	0.602	1.265	0.267	0.834	0.156	1.201	0.209

Table 2.4: *(Continued)*

Variable	None		Other		Pharmacist		Private		NDAP	
	Odds Ratio	Standard Error	Odds Ratio	Standard Error	Odds Ratio	Standard Error	Odds Ratio	Standard Error	Odds Ratio	Standard Error
Acute febrile symptoms (1/0)	1.718*	0.533	1.216	0.751	0.701	0.246	0.736	0.221	0.78	0.219
Acute musculoskeletal symptoms (1/0)	4.711***	2.112	4.894**	3.199	2.121	1.026	1.801	0.814	1.343	0.58
Other acute symptoms (1/0)	0.901	0.223	1.212	0.515	0.645	0.173	0.97	0.216	0.643**	0.135
Log of cost	0.996	0.005	0.996	0.005	0.996	0.005	0.996	0.005	0.996	0.005
Log of time	0.858***	0.029	0.858***	0.029	0.858***	0.029	0.858***	0.029	0.858***	0.029
Observations: 4,171										

Notes: The table provides odds ratios based on a conditional logit model. The reference category is visiting a public provider. Models are estimated over the sample that reported an acute illness. The employment and occupation variables refer to the employment and occupation of the household head. *, **, *** indicate significance at the 10%, 5% and 1% respectively.

The last two rows of Table 2.4 illustrate that respondents are sensitive to the time it takes to reach a provider, and are far less likely to visit providers located further away. Table 2.5 shows the marginal effects of travel time required to reach various types of providers. A 1 percent increase in travel time reduces the probability of visiting a NDAP by 4 percentage points and the probability of visiting a private doctor by 2 percentage points. Respondents are not as responsive in the case of travel time to pharmacists and public doctors. Consistent with Figure 2.3, these estimates show that the main advantage of NDAP is their proximity. The substantially larger negative effect of distance to NDAPs compared to more qualified providers suggests that if NDAPs were not located close by, their advantage would be whittled away as households would then be less likely to trade proximity for quality. Surprisingly, and an issue that we return to later, the cost of care does not seem to have a bearing on provider choice.

Table 2.5: Predicted probabilities of the effect of travel time to the provider

	Travel Time		Cost	
	Acute Illness	**Chronic Illness**	**Acute Illness**	**Chronic Illness**
No care	-0.018***	-0.020	0.000	-0.021***
Other	-0.003***	-0.002	-0.001	-0.003***
Pharmacy	-0.012***	-0.008	0.000	-0.009***
Private	-0.024***	-0.018	-0.001	-0.019***
Public	-0.009***	-0.008	-0.001	-0.009***
NDAP	-0.036***	-0.015	0.000	-0.017***

Notes: *, **, *** indicate significance at the 10%, 5% and 1% respectively.

Estimates pertaining to chronic illnesses are provided in Table 2.6. There is no strong statistical evidence of gender related differences. If anything, it seems that older males are more likely to forego care (OR – 2.16). Households headed by individuals with higher secondary education are far more likely to visit private providers (OR – 3.4). Caste and household per capita expenditure do not seem to exert a strong influence on provider choice. In contrast to the findings for acute illnesses, we find that travel time does not influence provider-choices. However, provider choice is sensitive to cost (last two rows of Table 2.6). A one percent increase in cost reduces the probability of visiting an NDAP or a private doctor by 2 percentage points (Table 2.5).

Table 2.6: Determinants of provider choice for outpatient care for chronic conditions

Variable	None		Other		Pharmacist		Private		NDAP	
	Odds ratio	Standard error	Odds ratio	Standard error	Odds ratio	Standard error	Odds ratio	Standard error	Odds ratio	Standard error
Female headed household (1/0)	0.635	0.213	0.738*	0.125	0.814*	0.101	0.806	0.137	0.863	0.114
Female older than 55 years (1/0)	1.478	0.633	0.810	0.193	0.951	0.170	0.812	0.200	1.209	0.218
Male aged 14-55 years (1/0)	1.268	0.473	0.816	0.166	1.010	0.147	0.806	0.161	1.075	0.170
Male older than 55 years (1/0)	2.157*	0.929	0.893	0.225	1.006	0.192	0.844	0.220	1.164	0.232
Log of household size	1.708	0.560	1.455*	0.298	1.807***	0.264	1.502**	0.310	1.642***	0.258
Self-assessed health measure Increasing in health (-1 to +1)	1.307	0.592	0.439***	0.101	0.434***	0.075	0.328***	0.073	0.588***	0.110
Primary education (1/0)	0.963	0.372	1.163	0.232	1.164	0.176	1.394	0.292	1.065	0.170
Secondary education (1/0)	1.053	0.326	0.871	0.162	1.134	0.149	1.326	0.239	0.799	0.114
Higher secondary education (1/0)	0.655	0.396	1.909**	0.596	2.596***	0.582	3.360***	0.965	1.382	0.350
Log of annual per capita exp. (INR)	2.034***	0.558	1.174	0.228	1.560***	0.203	1.126	0.218	1.212	0.175
Scheduled caste/tribe (1/0)	1.306	0.343	0.996	0.140	0.848	0.090	0.968	0.139	1.144	0.125
Self-employed in non-agriculture (1/0)	1.766	0.896	0.868	0.257	1.308	0.287	0.848	0.268	1.396	0.333
Other employment (1/0)	2.847*	1.651	1.576	0.513	1.370	0.393	2.261**	0.753	1.999**	0.572
Casual wage labourer (1/0)	1.071	0.545	0.726	0.173	1.135	0.201	0.896	0.224	0.972	0.189
Not working (1/0)	1.203	0.543	0.646	0.173	1.152	0.225	0.807	0.221	1.051	0.217
Doing housework (1/0)	1.404	0.557	0.654**	0.136	1.043	0.165	0.994	0.213	1.124	0.189
Students	0.786	0.463	0.513**	0.164	0.870	0.191	0.889	0.259	0.920	0.221
Kanpur Dehat	1.358	0.460	0.247***	0.061	0.491***	0.068	0.841	0.168	1.159	0.179
Pratapgarh	0.695	0.233	0.844	0.141	0.346***	0.042	0.703**	0.126	0.754**	0.103
Chronic lungs/respiratory symptoms (1/0)	2.153*	0.909	0.608**	0.145	1.520**	0.255	0.979	0.231	1.217	0.205
Chronic gastrointestinal symptoms (1/0)	3.616***	1.450	1.326	0.266	1.725***	0.295	0.839	0.205	1.632***	0.272

Table 2.6: *(Continued)*

Variable	None		Other		Pharmacist		Private		NDAP	
	Odds ratio	Standard error	Odds ratio	Standard error	Odds ratio	Standard error	Odds ratio	Standard error	Odds ratio	Standard error
Chronic allergic symptoms (1/0)	1.321	0.638	0.632*	0.157	1.185	0.219	1.021	0.244	0.701*	0.141
Other chronic symptoms (1/0)	1.924*	0.713	0.602***	0.110	1.616***	0.230	1.264	0.229	0.837	0.122
Chronic symptoms related to Internal organs (1/0)	2.304*	1.006	0.617*	0.163	1.647***	0.308	1.033	0.260	0.819	0.167
Log cost	0.841***	0.030	0.841***	0.030	0.841***	0.030	0.841***	0.030	0.841***	0.030
Log time	1.055	0.044	1.055	0.044	1.055	0.044	1.055	0.044	1.055	0.044
Observations: 3,276										

Notes: The table provides odds ratios based on a conditional logit model. The reference category is visiting a public provider. Models are estimated over the sample that reported a chronic illness. Sample excludes children below 13 years of age. The employment and occupation variables refer to the employment and occupation of the household head. *, **, *** indicate significance at the 10%, 5% and 1% respectively.

2.4 Discussion and conclusion

This paper examined healthcare seeking behaviour among households where at least one female member is affiliated to a woman's self-help group in rural parts of Bihar and Uttar Pradesh, India. Consistent with recent evidence from rural Odisha, a state in Eastern India (Gautham et al., 2011), we found that the majority of rural households do access some form of care. In the case of acute illnesses only 14 percent of respondents forego care and in the case of chronic illnesses about 30 percent do not seek care.

Analysis of provider usage patterns shows overwhelming use of private care for both outpatient and inpatient services. In the case of acute illnesses, private care is sought by 90 percent of those who seek care while the corresponding figures are 83 percent in the case of chronic illnesses and 78 percent in the case of hospitalization. This study confirms the findings of Ager and Pepper (2005) and Gautham et al. (2011) that non-degree allopathic providers account for a substantial proportion of health care. In this study such providers accounted for 56 percent of all visits in acute cases and 30 percent in the case of chronic illnesses (see Figure 2.1). With regard to acute illnesses, the econometric estimates highlight the importance of proximity in determining provider choice while the self-reported information (Figure 2.3) confirms that the main reason for relying so heavily on NDAP is their proximity. Somewhat different from findings reported in Borah (2006) and Sarma (2003), we found that direct costs did not have a bearing on choice of provider at least in the case of acute illnesses but does influence provider choice when households are faced with chronic illnesses. For chronic illnesses the econometric estimates show that cost plays a role in determining provider choice while proximity is not as important. This is consistent with the patterns in Figure 2.1 which show that qualified private practitioners are the most sought after providers in case of chronic illnesses and that households rely on such providers as they are considered the best source of care (see Figure 2.3). Overall, in the case of acute conditions, which are less likely to be serious, proximity appears to be important in driving provider choice while in the case of chronic conditions households feel the need for higher quality and costs are more likely to inhibit access to care. Notwithstanding these remarks, it is possible that identification of the cost effect is inhibited by the use of predicted cost variables, rather than actual information on costs of care across providers for different ailments.

Given the paper's focus on households where women are affiliated to self-help groups, the generalizability of the findings may be limited. Furthermore, the lack of information on cost of care and other provider-specific factors such as quality of care are also limitations. Notwithstanding, these limitations our findings confirm that in the locations studied there is a tendency to seek care from allopathic providers, mostly unqualified, and that publicly provided services are less likely to be chosen, even by a relatively poor population in two of India's poorest states.

This study has been conducted within the framework of a larger research program which deals with the implementation of CBHIs in rural India. A key implication from this study is that since proximity is an important factor influencing healthcare-seeking behaviour, CBHI schemes should also consider reimbursement for transportation costs and/or reimbursement of foregone earnings as part of the insurance package. Some experiments with CBHI in India and Nepal have already reported doing just that (Acharya et al., 2013; Devadasan et al., 2006). Finally, one cannot ignore the preponderant role of

NDAPs in provision of primary care. The debate over their role in the Indian rural medical provision system is well known (De Costa and Diwan, 2007; Kanjilal et al., 2007).

Chapter 3

Impact of community based health insurance on access and financial protection: Evidence from three randomised control trials in rural India

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3.1 Introduction

Less than 15% of the Indian population is covered by health insurance with the result that 94% of healthcare expenditure is paid for out-of-pocket (Bhandari et al., 2010; World Health Organization, 2012). The absence of pre-financing arrangements exposes many households to financial hardship when confronted with ill-health, or causes them to forego care altogether (Binnendijk et al., 2012; Bonu et al., 2009; Murray et al., 2012).

Since the 1990s, Community Based Health Insurance Schemes (CBHI) which involve beneficiaries in scheme design and management have been proposed to enhance access to care and provide financial protection (Aggarwal, 2010; Devadasan et al., 2010; Dror et al., 2007). Studies of CBHI operating in four Indian states report that scheme access is associated with increased utilization of health care (Aggarwal, 2010; Devadasan et al., 2010; Dror et al., 2007). However, none of these studies control for unobserved factors that may influence insurance uptake, although Aggarwal (2010) uses matching and Devadasan et al. (2010) use regression to control for selection on observables. A more convincing methodological approach is followed by Mahal et al. (2013)preventive products, and insurance. These factors motivated this intervention wherein a composite health-care package was delivered by a telemedicine-enabled community health worker (CHW who use a randomised design to establish that a pre-paid health card raised visits to community health workers and led to more referrals to doctors and hospitals and reduced length of hospitalisation and reduced out-of-pocket (OOP) expenditure in rural Maharashtra. While these papers purport to analyse the effect of community based insurance schemes, involvement of the community in determining scheme benefits and premiums, and thereafter managing the schemes is often limited. Government, private insurance companies and donors are usually heavily involved in the financing and operations of the schemes.[17] Studies outside of India frequently report that CBHI is positively associated with increased health care utilization and improved financial protection (Ekman, 2004; Mebratie et al., 2013). But only a handful of studies control for observed and unobserved characteristics that may have a bearing on insurance uptake and may also influence the outcomes of interest.[18]

This paper makes two main contributions. First, it adds to the literature by evaluating the effects of three CBHI schemes in northern rural India set up as step-wise clustered randomised control trials (CRCT). We offer one of the few studies which uses an experimental approach to evaluate the impact of CBHI schemes. We use the randomised rollout of the schemes to identify their impact on health care utilization and financial protection, while distinguishing between outpatient care and hospitalizations. In addition to the methodological novelty, the paper assesses the impact of CBHI schemes which have been designed, and which are administered and managed by the communities themselves and which do not receive any financial or technical support from a government or a private provider.

[17] Mebratie et al. (2013) classify CBHI schemes into three categories: government-run community-involved schemes, provider-based health insurance schemes and community-driven and community-managed schemes. The schemes under scrutiny in this paper lie in the last category. Typically, such schemes charge lower premiums, offer less generous packages but have a higher degree of community involvement.

[18] Eight of the 46 studies reviewed in Mebratie et al. (2013) use baseline and follow-up data and control for self-selection effects. Only one of these studies is based on a randomised control design (Levine et al., 2012).

The paper is organised as follows: Section 2 describes the CBHI schemes. Section 3 discusses the data while section 4 outlines the empirical approach. Section 5 presents the results and the final section contains a discussion and concluding remarks.

3.2 CBHI Schemes

The CBHI schemes were introduced in 2010 by the Delhi-based Micro Insurance Academy in partnership with three local NGOs in Kanpur Dehat and Pratapgarh districts in Uttar Pradesh and in Vaishali district in Bihar. The two states are amongst India's most populated and least educated with large gender disparities (Planning Commission, 2011). Enrolment in the schemes was offered to households connected to Self Help Groups (SHG). SHGs consist of 10-20 women living in the same village who come together and agree to save a specific amount each period and are generally trained and supported by NGOs (Fouillet and Augsburg, 2008).

At each of the three sites, the target group was defined as all members of households with at least one woman registered by March 2010 as a member of a SHG. The 91 villages in the three districts were grouped into 48 clusters (15 in Pratapgarh, 17 in Kanpur Dehat and 16 in Vaishali). Clusters were formed by combining contiguous villages such that they contained roughly an equal number of SHG households (60 to 80). Subsequently, at each site, the clusters were randomly assigned to one of the three implementation waves (2011-2012-2013). In each of the implementation waves, all SHG households within the selected clusters were offered an opportunity to enrol in the CBHI schemes. By the end of the project the entire target population had been offered a chance to join the schemes. Additional details on the design of the experiment are available in Doyle et al. (2011).

Preparations for the scheme started in the second half of 2010 with a campaign to raise insurance awareness including the screening of a movie in the intended treatment areas and numerous meetings held at the SHG level. From June to December 2010, based on a set of four to six initial benefit packages designed by the Micro Insurance Academy, the intended subscribers of the first wave were offered a chance to choose benefit packages.[19] This took place in three steps. In the first stage, individual SHG members determined the benefit package they preferred. In the second stage, the individual members debated their choices and the SHG group was asked to provide a first and a second choice package. In the third stage, all the SHG groups met and debated their choices and the package that was chosen by most groups was retained in each district (for details, see Dror et al., 2014). Scheme rollout took place in February 2011 in Vaishali and Pratapgarh and in March 2011 in Kanpur Dehat. Prior to scheme rollout, SHG members were chosen to form parts of the claims committees and governing bodies that steer the day-to-day operation of the insurance scheme. The claims committees meet about every three weeks to decide on claims and pay-outs, which are settled on a cash basis.

Table 3.1 shows the benefit packages chosen across the three sites in the first year of the project (2010). Although site specific annual premiums are not considerably different, the packages chosen do vary. Members in Vaishali chose cover exclusively for outpatient care while those in Pratapgarh

[19] The benefit packages offered to the SHG members were designed on the basis of information available in the baseline data and take into account local health care costs, availability of facilities and the probability of experiencing different health problems.

initially opted only for inpatient care, but opted to extend coverage to outpatient care after one year. Members in Kanpur Dehat opted for a shallower coverage of both outpatient and inpatient expenses. A potential reason for the preference for only outpatient coverage in Vaishali could be the penetration of the government run Rashtriya Swasthya Bima Yojana programme that provides insurance coverage for inpatient care (Bhandari et al., 2010).[20] Changes to the benefit packages could be made annually (prior to the next enrolment wave) (see Annex 3.1 for coverage in 2012). Given that inpatient expenses were never included in the benefit package in Vaishali, we exclude observations from this site when estimating effects on inpatient utilization and expenses.

Table 3.1: CBHI package details in 2011 (wave 1)

Sites	Pratapgarh	Kanpur Dehat	Vaishali
Annual CBHI premium per person/per year (INR)	176	192	197
Coverage for hospitalization			
Fees (maximum coverage per episode, INR)	6000	3000	-
Wage loss (per day, INR)[1]	100	75	100
Transport (maximum coverage per episode, INR)[2]	100	100	-
Coverage for outpatient care			
Fees (INR)	-	Unlimited	Unlimited
Lab tests (per year, INR)[3]	-	-	200
Imaging tests (per year, INR)[4]	-	-	300
Coverage for maternity care			
Caesarean (per episode, INR)	5000	-	-

Notes: "-" indicates "Not Included in package". [1] In Pratapgarh wage losses covered from the 3rd to the 6th day, in Kanpur Dehat from the 4th to the 13th day and in Vaishali from the 4th to the 9th day. [2] For hospitalization of more than 24 hours. [3,4] Maximum amount, per person per year.

It is important to note that throughout all sites and years, coverage for outpatient care is restricted to designated practitioners, mainly Rural Medical Providers.[21] While not necessarily licensed, these providers are responsible for a majority of health care visits for outpatient care (Gautham et al., 2011; Raza et al., 2013). They are contracted on a yearly capitation basis, with monthly instalments, and are expected to provide care and medicines free of charge to the insured. For other covered expenses, receipts are provided by the beneficiaries and reimbursements are decided upon by the claims committees.

[20] Below-poverty-line households living in the three districts where the CBHI schemes are offered are eligible to enrol in the RSBY. In these districts the RSBY scheme covers only inpatient care while the CBHI offers communities an option to cover both types of care. Our data suggest that the two schemes complement each other as at the time that the package choices were offered to wave 1 households, Vaishali district had an RSBY uptake rate of 48 while RSBY uptake was 18 percent in Pratapgarh and 15 percent in Kanpur Dehat.

[21] By 2013, the Kanpur CBHI scheme had begun offering the services of a qualified doctor who visited the office of the local partner NGO and other designated places on a weekly basis.

Initially, the intention was that enrolment would be at the household level. However, this was not followed as households claimed that paying premiums for all household members was a heavy financial burden. Hence, scheme administrators decided that provided women linked to the SHG enrolled, they could join the scheme alone or with selected members of their household.

During the first wave of implementation, at least one individual from 39% of the households that had been offered insurance joined the scheme while during the second wave the corresponding figure was 45%. In terms of individuals, these figures translate into an individual insurance uptake rate of 23% in wave 1 and 24% in wave 2. Dropout rates are quite high with 54% of the households (42% of individuals) who enrolled in the first wave renewing in the second, followed by a renewal of 25% of those originally enrolled households (17% of individuals) during the third wave. Analysis of enrolment decisions from the first wave reveals that except for hospitalization, which increases the probability of enrolling by 10 percentage points in Kanpur Dehat, there is no evidence that enrolment is motivated by previous illnesses (Panda et al., 2014). While direct evidence of adverse selection may seem modest, households with children seem to be more risk averse or expect a higher need for health care and are substantially more likely to enrol.

3.3 Data

3.3.1 Data collection

We use three rounds of household panel data collected from SHG-linked households living in each of the three sites. The surveys covered *all* eligible households. In all the surveys the primary respondents were the SHG members themselves or the head of the household if the member was unavailable. The baseline survey was canvassed before any household was offered enrolment (March-May 2010) and covered 21,372 individuals (3,685 housheholds).[22] In April-May 2011, SHG-linked households residing in a third of the clusters were offered a chance to enrol in the scheme. The second survey was conducted between March and May 2012 during which 18,405 individuals (3,318 households) were re-interviewed, of whom 1,596 individuals were new to the households by means of marriage, birth and split households. Subsequently, enrolment was offered to a second cohort, that is, an additional one third of the target group. The third survey was conducted between March and May 2013 and comprised 18,322 individuals (3,307 households) of whom 4,285 individuals were new additions over the two previous years. By May 2012, about two-thirds of the sample (14,209 of the 21,372 individuals surveyed in 2010 or 2,517 of the 3685 households) had been offered a chance to enrol in the schemes. Those who had been offered a chance to enrol in the schemes by May 2012 are considered the treatment group, while those who had not been offered a chance to enrol by May 2012 are referred to as controls (see Annex 3.2 for details on sample size and distribution between treatment and control in each wave).

[22] All targeted households (SHG members) in the three districts were included in the survey. The study was designed to detect a "small" to "medium" effect. At each site the minimum detectable effect size is 0.4 standard deviations while it is 0.2 standard deviations for the full sample. The calculations were based on a 5% probability of committing a Type I error, power of 80% and an intra-cluster correlation of 5%. Accordingly, for the pooled sample, for outpatient care (mean – 0.8, standard deviation 0.4) an effect of size 0.08 (a 10% increase in utilization) is detectable while for inpatient care (mean 0.03, standard deviation 0.16) an effect of size 0.03 (a 100% increase in utilization) is detectable. As these figures suggest, the available sample sizes make it harder to detect an effect on inpatient care.

3.3.2 Variables

The main outcome variables of interest relate to health care utilization and health care expenditures. Outpatient care in the 30 days preceding the survey is recorded for all individuals in the household for whom sickness is reported during that period. Inpatient care in the 12 months preceding the survey is recorded for all individuals. Information on health care costs (consultation fees, costs of medicine and lab/imaging tests) and the manner in which a household finances costs was gathered for both outpatient and inpatient care and is reported for each individual. This information was used to define the probability that a household resorted to *hardship financing* to cover the cost of care reported for each individual. That is, meeting health care costs by borrowing from high interest rate lenders, cutting back on essential expenditures[23] or selling assets (Binnendijk et al., 2011). All analyses are conducted on outcomes defined at the individual level.

In addition to these outcome variables the surveys gathered information on a range of demographic (age/gender indicators, household size, gender of household head), socioeconomic (educational attainment, occupational status, scheduled caste/tribe status and per capita household expenditures) and health related characteristics. Information on per capita consumption (net of healthcare spending) is based on a 30-day recall period for store bought and home grown food items and a 12 month recall period for household durables and investments in agricultural equipment.[24]

3.3.3 Summary Statistics

Table 3.2 presents baseline means of outcome variables for individuals residing in clusters that were offered a chance to enrol in the scheme by 2012 (treatment group) and individuals living in clusters that were not offered a chance to enrol by 2012 (control group). Three of the nine outcome variables are statistically different across the treatment and control groups but the gaps are not substantial.[25] The site specific means presented in Annex 3.3 show that there are no statistically significant differences in the baseline means of the outcome variables in Kanpur Dehat and that in the other sites the differences are limited to one or two outcomes. The differences observed in the probability of using outpatient care in the pooled sample emanate from both Pratapgarh and Vaishali. In Pratapgarh the treatment group is more likely to seek outpatient care (79.3 versus 72.9 percent) and in Vaishali the treatment group is less likely to seek outpatient care (83.7 versus 86.8 percent).

[23] This includes, delays in paying bills for rent, fuel, agricultural/business inputs, pulling children out of school or reducing food consumption.

[24] Expenditure data, that is, healthcare costs and per capita expenditure are in 2010 prices.

[25] The reported illness rates may seem on the higher side but they are not particularly different from morbidity rates obtained from surveys conducted in similar parts of the country by other researchers. For instance, based on a survey conducted in 2010 in Gaya district of Bihar, India, Binnendijk et al. (2012) report an illness rate of 31.4 percent in the month preceding the survey; in a survey conducted in 2013-2014 in the neighbouring state of West Bengal, Kanungo et al. (2015) report a morbidity rate of 56 percent in the two months preceding the survey.

Table 3.2: Means of outcome variables at baseline – Treated (offered CBHI by 2012) and control (not offered CBHI by 2012) groups

	Individuals offered enrolment by 2012	Individuals not offered enrolment by 2012	Test: Treated=Control
	Treated Mean	Control Mean	*p*-value
	1	2	3
Reporting an illness (1/0)	0.34	0.33	0.23
Observations	*14894*	*6478*	
Health care utilization (1/0)			
Outpatient care conditional upon reporting illness	0.81	0.79	0.04
Outpatient care from a Rural Medical Practitioner conditional upon reporting illness	0.37	0.37	0.67
Observations	*5061*	*2146*	
Inpatient care	0.03	0.03	0.06
Observations	*14894*	*6478*	
Individual health care expenditures (conditional upon use)			
Outpatient care expenses (INR)	666	611	0.27
(standard deviation)	(2052)	(1500)	
Hardship financing for outpatient care (1/0)	0.18	0.18	0.57
Observations	*4082*	*1685*	
Inpatient care expenses (INR)	12079	13361	0.40
(standard deviation)	(14723)	(19142)	
Hardship financing for inpatient care (1/0)	0.55	0.50	0.25
Observations	*400*	*204*	
Health care expenditures (full sample)			
Outpatient care expenses (INR)	226	203	0.17
(standard deviation)	(1237)	(910)	
Inpatient care expenses (INR)	325	418	0.07
(standard deviation)	(3102)	(4115)	
Observations	*14894*	*6478*	

Notes: The number of observations varies depending on the outcome. The full sample size is 21,372 observations with N = 6,265 in Kanpur, 7,814 in Pratapgarh and 7,293 in Vaishali. Hardship financing is defined as having to meet health care costs by borrowing from high interest rate lenders, cutting back on essential expenditures or selling assets.

Baseline means for a set of demographic and socio-economic characteristics are provided in Annex 3.4. For the pooled sample, a number of the covariates are statistically different across treatment and control groups but again the differences are not substantial. The treatment group has slightly smaller households (6.75 versus 6.85 members) and a slightly higher proportion of household members with secondary education (29 percent versus 26 percent). However, they are more likely to belong to the

lowest consumption tertile (39.5 versus 37.2 percent) and are more likely to belong to scheduled castes (34 versus 29 percent). Although there are differences in magnitude, the site specific means display similar patterns, except for one trait. The proportion of scheduled caste households in the treatment group is much lower in Kanpur while it is higher in the case of the other two sites.

The overall impression emerging from an assessment of the baseline characteristics across the two groups is that, while not perfect, the clustered-randomization approach has delivered comparable groups. There is no clear link between treatment status and socio-economic traits. While some of the pre-treatment outcomes and demographic and socio-economic traits are statistically different, except for caste affiliation, the differences are not substantial. As discussed in the next section our empirical approach controls for time- invariant attributes such as caste.

3.4. Empirical strategy

3.4.1 Intention to treat effect

We first investigate whether being offered CBHI membership has an effect on healthcare utilization and financial protection; that is, the intention-to-treat effect (ITT). For the binary health care utilization outcomes (y_{ivt} for individual i in village v at time t) we use a model specified as:

$$y_{ivt} = \gamma OFFER_{vt} + x_{ivt}\beta + \delta_t + \alpha_v + \varepsilon_{ivt}. \quad (1)$$

The model includes year indicators (δ_t) to capture time trends in healthcare use common to both treated and control groups, village fixed effects (α_v) to capture time-invariant village level characteristics[26], a set of time varying individual and household variables (x_{ivt}) as shown in Annex 3.4 and the key indicator variable of interest ($OFFER_{vt}$) which is switched on if households in village v had been offered the possibility of enrolling in the CBHI program at time t. For half the treatment group the post-treatment period is two years while for the other half it is one year.

We use a (village) fixed effects Poisson model to estimate the effect of being offered CBHI on healthcare spending. The Poisson model is well suited to dealing with skewed outcomes with a mass at zero (Buntin and Zaslavsky, 2004; Manning and Mullahy, 2001; Mihaylova et al., 2011; Santos and Tenreyro, 2006; Wooldridge, 2001).[27] For the expenditure outcome variables, m_{ivt}, we specify the conditional mean as:

$$E(m_{ivt}|OFFER_{vt}, x_{ivt}, \delta_t, \alpha_v) = \exp(\gamma OFFER_{vt} + x_{ivt}\beta + \delta_t + \lambda_v), \quad (2)$$

where we economize by using the same notation for parameters as (1). The estimated coefficients may be interpreted as percentage changes in m due to a unit change in the explanatory variables.

[26] We use village level rather than individual level fixed effects as the IV versions of the non-linear models cannot accommodate individual fixed effects. The results were robust to the inclusion of individual fixed effects rather than village fixed effects. Results from the ITT models were also robust to using a logit model for the binary outcomes rather than a linear probability model.

[27] The Poisson is optimal when the conditional variance is proportional (not equal) to the conditional mean, but also consistent when this is not the case.

3.4.2 Average treatment effect on the treated

The ITT effect is a lower bound of the effect of actually enrolling in the CBHI schemes – the average treatment effect on the treated (ATET). Since households in the control group were not able to access CBHI, the ATET is simply the ITT scaled by the proportion of those offered CBHI that actually enrolled. While the offer of insurance was randomized, uptake is not exogenous. To estimate the ATET of insurance enrolment while accounting for self-selection into CBHI we use the randomized offer of CBHI as an instrument for actual uptake (Imbens and Wooldridge, 2009).[28] Models for the binary healthcare utilization outcomes are estimated using two-stage least squares and for healthcare expenditures, IV-Poisson models are estimated using a two-stage GMM estimator (Windmeijer and Santos Silva, 1997).[29] The first stage of these IV models is specified as:

$$uptake_{ivt} = \theta OFFER_{vt} + x_{ivt}\rho + \delta_t + a_v + u_{ivt}, \quad (3)$$

where the dependent variable is 1 if the household accepts the offer of CBHI, and is 0 if the offer is declined or not made.[30]

In all models, standard errors are adjusted to allow for serially and/or spatially correlated shocks at the cluster level (Angrist and Pischke, 2009; Bertrand et al., 2004). We first estimate models using the data pooled across the states (3 for outpatient utilization/expenses and 2 for inpatient), followed by site specific estimates. All statistical analysis is done in Stata 13.

3.4.3 Attrition

The rate of attrition between 2010 and 2012 was 21.36% and between 2012 and 2013 it was 17.91%, or a total attrition rate of 39.21% at the individual level. At the household level, the rate of attrition by 2012 was 17.67% and 8.56% in the following year, leading to a total of 26.23%. We examined the probability of attrition between the baseline and the endline surveys as a function of demographic and socioeconomic characteristics and also examined whether attrition rates vary across survey enumerators. The estimates suggest that attrition may be attributed to migration for work as unemployed males in the age group 14 to 55 and who have completed middle to high school are most likely to exit the sample.[31] To check for attrition bias, we constructed inverse probability weights by running wave-specific probit models of remaining in the sample by the next wave on baseline covariates (Jones et al., 2013). Including these weights in our regression models led to negligible changes in the estimates (the results are available on request).

[28] Since no one in the control group can access CBHI and there is imperfect compliance in the treatment group, the local average treatment effect (LATE) is equal to the ATET.

[29] In the case of the IV-Poisson model, equation (3) is estimated using ordinary least squares. To control for endogeneity, the residual from this first-stage regression is included as an additional regressor in equation (2). The augmented model is then estimated using GMM.

[30] See Annex 3.5 for first stage regression results. The probability of enrolment is higher for older males and those with primary education versus no education.

[31] An examination of the link between the probability of attrition and enumerator codes suggests that variation over enumerators accounts for a negligible proportion of variation in attrition.

3.5 Results

3.5.1 Effects on health care use

The top panel of Table 3.3 displays the impact of the randomized offer of insurance (ITT) and the uptake of insurance (ATET) on the probability that individuals reporting sickness use outpatient and inpatient care based on the data pooled across the three sites. The ITT estimates show no significant effect of the offer of insurance on any utilization outcome, including care from Rural Medical Practitioners (RMPs) who are intended to be the main source of outpatient care covered by CBHI in all three sites. Scheme uptake is about 23% and so the ATET estimates are about four times larger than the ITT estimates but insignificant.

Table 3.3: Effects of the randomized offer (ITT) and uptake of insurance (ATET) on healthcare utilization and financial protection - data pooled across three intervention sites

	ITT		ATET	
	Marginal effect	**Standard error**	**Marginal effect**	**Standard error**
Health care utilization				
Outpatient care conditional upon reporting illness	-0.016	(0.021)	-0.065	(0.082)
Outpatient care from a Rural Medical Practitioner conditional upon reporting illness	0.001	(0.017)	0.005	(0.069)
Observations			*22,569*	
Inpatient care	-0.001	(0.004)	-0.005	(0.017)
Observations			*38,045*	
Health care expenditures (conditional upon use)				
Outpatient care expenses	-0.044	(0.063)	-0.203	(0.173)
Hardship financing for outpatient care	0.001	(0.020)	0.002	(0.081)
Observations			*16,665*	
Inpatient care expenses	0.102	(0.252)	0.047	(0.135)
Hardship financing for inpatient care	0.016	(0.33)	0.047	(0.135)
Observations			*914*	
Health care expenditures (full sample)				
Outpatient care expenses	-0.059	(0.060)	-0.225	(0.206)
Observations			*58,099*	
Inpatient care expenses	0.121	(0.256)	0.882	(1.013)
Observations			*38,045*	

Notes: For binary outcomes (health care utilization and hardship financing), ITT effects are estimated by OLS and ATET effects are estimated by 2SLS with CBHI enrolment instrumented by the randomized offer of insurance. For expenditure outcomes, ITT effects are estimated by Poisson regression and ATET effects are estimated by GMM of a Poisson model with CBHI enrolment instrumented. All models include village level fixed effects, time effects and control for the covariates listed in Annex IV. See notes to Table II for the definition of hardship financing. Effects on outpatient utilization/expenses are estimated using observations from all three sites. Effects on inpatient utilization/expenses are estimated using observations from Kanpur Dehat and Pratapgarh.

Site specific results are reported in Table 3.4 (top panel). In Kanpur Dehat, the offer of insurance is associated with a 4 percentage point increase in the probability of seeking outpatient care from any provider with the entire increase coming from an increase in the probability of using RMPs but the estimated effects are not statistically significant at conventional levels. In Vaishali, the CBHI has no effect on utilization. In Pratapgarh, an offer of insurance, which did not initially include coverage of outpatient care in this site, is estimated to lead to a statistically significant 7 percentage point decline in the probability of seeking outpatient care. Actual uptake of CBHI is estimated as being associated with a large decline (51 percentage points) in the probability of using outpatient care.[32] The decline in use of outpatient care is partly, although not significantly, due to a reduction in the use of RMPs but the main change is that households in Pratapgarh are less likely to use general practitioners/specialists once insurance, which does not cover care from these providers, is offered (results not shown in table). Substitution away from practitioners outside the scheme coverage is not unexpected. However, this does not explain the negative coefficient on the use of RMPs.

3.5.2 Effects on financial protection

ITT and ATET estimates of the effect of insurance on out-of-pocket health care expenditure for outpatient and inpatient care and on the probability of *hardship financing* are provided in the lower panel of Table 3.3. Estimates are provided conditional upon the use of care and also for the full sample. The point estimates for outpatient expenses are negative. But those for inpatient expenses are positive and there is no significant evidence that access to the CBHI scheme works towards reducing out-of-pocket expenditures. This is counter to what one might expect given that there is no significant impact on utilization.

Site specific results (Table 3.4) show that the CBHI has no effect on health expenditure or on the probability of *hardship financing* in Kanpur Dehat and in Vaishali. In the case of Pratapgarh, the ITT estimates indicate that, conditional on use, access to CBHI leads to a 16.4 percent decline in outpatient care expenditure while the ATET effects indicate an 80 percent decline for those with CBHI cover. But this follows from the estimated reduction in the use of outpatient care and should not be interpreted as indicative of a protective influence of the scheme.[33] There is no evidence of any impact on inpatient expenses or hardship financing in Pratapgarh.

[32] Outpatient care was only included in the CBHI schemes offered in Pratapgarh in wave 2 but not in wave 1. Restricting the sample to the baseline and endline surveys also yields negative, albeit statistically insignificant estimates of the CBHI scheme on the probability of using outpatient care in Pratapgarh.

[33] Not only is there a decline in the incidence of outpatient health care use (reported in Table 3.4) but also a statistically significant decline in the number of outpatient visits {ITT: -0.164 (Std. Err: 0.077);ATET: -1.251 (Std.Err: 0.657)}.

Table 3.4: Effects of the randomized offer (ITT) and uptake of insurance (ATET) on healthcare utilization and financial protection – site specific estimates

	Kanpur Dehat				Pratapgarh				Vaishali			
	ITT		ATET		ITT		ATET		ITT		ATET	
	Marginal effect	Standard error	Marginal effect	Standard error	Marginal effect	Standard error	Marginal effect	Standard error	Marginal effect	Standard error	Marginal effect	Standard error
Health care utilization												
Outpatient care conditional upon reporting illness	0.041	(0.026)	0.163	(0.113)	-0.068**	(0.024)	-0.513**	(0.256)	-0.005	(0.028)	-0.017	(0.082)
Outpatient care from a Rural Medical Practitioner conditional upon reporting illness	0.04	(0.033)	0.162	(0.137)	-0.028	(0.023)	-0.215	(0.188)	-0.008	(0.023)	-0.024	(0.068)
Observations	*6,506*				*8,187*				*7,944*			
Inpatient care	0.002	(0.004)	0.010	(0.023)	-0.003	(0.004)	-0.012	(0.018)				
Observations	*16,479*				*21,566*							
Health care expenditures (conditional upon use)												
Outpatient care expenses	0.045	(0.106)	0.316	(0.396)	-0.164***	(0.061)	-0.794**	(0.349)	0.000	(0.072)	-0.031	(0.220)
Hardship financing for outpatient care	0.01	(0.028)	0.041	(0.109)	-0.007	(0.011)	-0.05	(0.074)	0.008	(0.024)	0.024	(0.071)
Observations	*4,639*				*6,107*				*5,919*			
Inpatient care expenses	-0.196	(0.312)	-0.301	(0.261)	0.542	(0.425)	0.989	(1.136)				
Hardship financing for Inpatient care	0.093	(0.99)	0.301	(0.261)	-0.045	(0.82)	-0.114	(0.125)				
Observations	*416*				*498*							
Health care expenditures (full sample)												
Outpatient care expenses	0.107	(0.095)	0.507	(0.598)	-0.238***	(0.077)	-1.078***	(0.385)	-0.028	(0.072)	-0.049	(0.264)
Inpatient care expenses	-0.093	(0.304)	-2.840	(3.207)	0.385	(0.402)	0.547	(1.207)				
Observations	*16,479*				*21,566*				*20,054*			

Notes: *, **, *** indicate significance at the 10%, 5% and 1% respectively.

3.6 Conclusion

This paper utilizes data from three randomised control trials to evaluate the impact of community based health insurance (CBHI) schemes offered to families of women belonging to self-help groups in rural India on healthcare utilization and expenditures. Our analysis reveals that the schemes had no impact on access to outpatient or inpatient care. Nor do we find any impact on healthcare expenditure. Perversely, at one of the sites (Pratapgarh) studied we find that access to insurance led to a decline in utilization of outpatient care. This may be partly due to the lack of initial coverage of outpatient care in this site but it also appears indicative of the failure of the schemes examined to improve access and financial protection. The lack of success is also underlined by the high scheme drop-out rate. Two years after its introduction, only about 17% of those who had enrolled in CBHI renewed their membership (Panda et al., 2015). Although not directly comparable due to differences in scheme design, our findings differ from those reported in the case of other CBHI schemes implemented in India. For instance, in the case of the Yeshasvini scheme in Karnatatka, Aggarwal (2010) finds a 6-7% increase in the use of outpatient care and a 30% reduction in hardship financing. Mahal et al. (2012) report a 20 to 25% increase in the use of outpatient care from community health workers.

Qualitative field work based on interviews with 33 households who had enrolled in the scheme for at least one year, as well as discussions with the organization implementing the scheme provides clues to the underlying reasons for the disappointing results. Sixteen of the households reported that they had to pay for outpatient services and medicine for conditions that should have been covered by the insurance scheme. Ten of the 33 households dropped out after a year and the most common reasons for dropping out included poor quality of services and expenditure on premiums *and* the need to pay for care from non-designated providers. The insurance scheme offers access to outpatient care at designated providers who are paid on a capitation basis. Since the designated providers are chosen in consultation with the community, it is unlikely that the perception of poor quality services is due to those providers falling short of the standards offered by the alternatives. The most likely explanation is that the payment system, which pays a fixed fee per patient per year, provides an incentive to lower the quality of care offered to insured patients compared to that offered to those paying fee-for-service. A Rural Medical Practitioner was paid INR 40 per insured patient per year while the estimated cost per visit was INR 125 (see, Raza et al., 2013). Problems related to the capitation system have also been mentioned as the main reason for the absence of positive effects of CBHI in Burkina Faso (Fink et al., 2013), and may be compounded by a lack of competition between providers.[34]

With regard to inpatient care, the lack of an effect may be related to the small sample size given the infrequency of hospitalizations in the target population. Furthermore, coverage for inpatient care is relatively shallow, which is a more general problem in the context of community based schemes which operate without subsidies.[35]

[34] On average, there was only 0.28 RMPs per village in Pratapgarh while it was 0.5 in the other two sites.

[35] For instance, in Pratapgarh in 2012 the maximum coverage per inpatient care event was INR 4000, while at baseline, conditional upon use, inpatient care expenses incurred by individuals who were offered insurance in the preceding year was INR 12,000.

There are some limitations to this study. The focus only on households belonging to Self-Help Groups hinders generalizability, the number of clusters per site limits power and the explanations provided for the unexpected effects may be considered speculative. Notwithstanding these limitations, the results of this study display that CBHI schemes, at least of the type examined here, which do not receive external financial or technical support, are unlikely to have a large effect on access to care and financial protection.

Chapter 4

Analyses of enrolment, dropout and effectiveness of RSBY in northern rural India

In collaboration with: Ellen Van de Poel and Pradeep Panda

4.1 Introduction

Improving access to adequate healthcare services and financial protection features high on policy agendas of low and middle income countries. In India, a developing country with a third of the population living below the poverty line and nearly 94% of the workforce in the informal sector, there has been little or no access to effective social protection schemes against catastrophic medical expenditures until recently (Birdsall, 2015).[36] Healthcare costs are typically financed out of pocket (OOP) and patients have strong preferences for private care providers, despite the country boasting a free public healthcare system (Raza et al., 2013; World Health Organization, 2012)supported by non-governmental organizations (NGOs.[37] Hospitalizations alone, account for more than a quarter of the population falling into poverty every year (Flores et al., 2008; Shahrawat and Rao, 2012).

Since the 1990s, a number of interventions have been launched to fill this vacuum, with community based health insurance (CBHI) schemes being amongst the most popular (Aggarwal, 2010; Raza et al., 2014). Implemented predominantly by non-government organizations, these schemes are generally characterized by limited voluntary participation and shallow benefit packages (Acharya et al., 2012). Their effectiveness in promoting healthcare utilization and providing financial protection are consequently mixed (Ekman, 2004; Mebratie et al., 2013). The Government of India (GoI) has also been active in this domain through a number of national and local schemes (Devadasan and Jain, 2008; Prinja et al., 2012).[38] High administrative costs, lack of accountability and sustained efforts in implementation, monitoring and evaluation have however, led to the dissolution of many such programmes (Balooni et al., 2012; Prinja et al., 2012; Results for Development Institute, 2010; Sood et al., 2014). Taking into account the shortcomings of previous endeavours, in 2008, the GoI launched the Rashtriya Swasthya Bima Yojana (RSBY) insurance programme (Karan et al., 2014). A national level programme, the RSBY is expected to eventually provide universal healthcare coverage (UHC) (Devadasan et al., 2013; Karan et al., 2014).

Administered by state governments in partnership with private insurance companies, the heavily subsidized RSBY targets households below the poverty line (BPL) and provides cashless protection against hospitalization costs.[39] Families of up to five persons pay an annual premium of INR 30 per year for protection against hospitalization costs of up to INR 30,000 in any of the empanelled hospitals. The programme has been rolled out in 436 (of 479 targeted) districts in all 29 states of the country and enrolled 37 million households (approximately 55% of total BPL households) since 2008 (Government of India, 2015). From 2011, the RSBY has also been piloting outpatient coverage across eight districts (Nandi et al., 2013; Shoree et al., 2014b).

Seven years after the start of the program, the evidence base on various aspects of the RSBY remains sparse. Sun (2010) presents one of the first studies to investigate the determinants of enrolment using

[36] Less than 15% of the population was covered by health insurance in 2009 (Berman et al. 2010).

[37] Private expenditure constitutes 81% of total health expenditure in India of which 94% is out-of-pocket expenditure (Bhandari et al., 2010; World Health Organization, 2012).

[38] Schemes from state governments include Sanjeevani implemented in Punjab, the Chief Minister's Health Insurance scheme in Assam and the Aarogyasri in Andhra Pradesh. At the national level, the ministry of finance had implemented the Universal Health Insurance Scheme along with Employees State Insurance Scheme and the Central Government Health Scheme (Chawla and Ellis, 2000; Devadasan and Jain, 2008; Prinja et al., 2012).

[39] Recently the programme has been expanded to include additional categories of poor households such as construction workers, rural employment guarantee scheme workers, street vendors and so forth (Shoree et al., 2014a).

village level census data from seven states. The study reveals some evidence of cream-skimming by insurance companies in that they prioritize enrolling healthier villages first. Similarly, there is greater enrolment in villages with a larger number of BPL households, increased distance from the nearest town and greater availability of education and medical facilities. The second part of the study uses household level data to conclude that there is gender preference towards men when enrolling households with more than 5 members. Using a combination of district level data from 2007-2008 from 590 districts and matching it with the District Level Household Data survey, Nandi et al. (2013) examine how socioeconomics, political and institutional factors correlate with RSBY participation at the district level. The paper first estimates the probability of a district participating in RSBY, followed by a model of the determinants of household enrolment in participating RSBY districts. They conclude that districts with a higher scheduled caste or tribe (SCST) population, weaker administrative capacity and pre-existing insurance schemes experience lower participation and enrolment rates. To understand the importance of insurance literacy in engaging potential clients, Das and Leino (2011) collect household data to assess the impact of the Information and Education Campaign (IEC) on enrolment into the RSBY in Delhi. They find that IEC is not associated with higher enrolment and suggest the timing of the campaign (two months prior to the enrolment) as a potential explanation.

Evidence on the impact of the scheme on health care use and financial protection thus far has been mixed. Nandi et al. (2013) find greater benefits of the programme being captured by higher socioeconomic groups. Hou and Palacios (2010) observe higher rates of healthcare utilization among RSBY households. Neither of the studies however control for either observable or unobservable characteristics that may influence insurance uptake and health care use. Devadasan et al. (2013) find continuing OOP despite RSBY membership, but the use of cross-sectional data also limits their ability to control for self-selection and hence claims of causality. Selvaraj and Karan (2012) do control for district-level heterogeneity in observable and (time invariant) unobserved characteristics by using difference-in-differences on data from 321 RSBY districts and 291 non-RSBY districts in the Andhra Pradesh, Karnataka and Tamil Nadu states. The authors find that hospitals in RSBY districts inflate their costs over time due to weak scheme administration and operational oversight, leading to increases in expenses for inpatient care. This culminates in a greater likelihood of RSBY households facing catastrophic levels of expenditures.

This paper adds to the literature on RSBY in several ways. First, we analyse household level determinants of RSBY enrolment using household level panel data collected in 2012 and 2013. Earlier studies are primarily derived from administrative data collected during the initial stages of the programme (2008-2010). Second, this is the first study to investigate the determinants of dropping out of the scheme. Retaining membership is an important indicator of the sustainability/usefulness of the scheme. Third, we investigate whether RSBY membership is associated with increased use of hospital care and financial protection. Finally, this is the first paper to focus on the scheme in Uttar Pradesh (UP) and Bihar which are among the poorest and least educated states in the country.

The paper is organised as follows: The following section describes the details of the RSBY programme. Section 2 discusses the data while section 3 outlines the empirical approach. Section 4 presents the results and the final section contains a discussion and concluding remarks.

4.1.1 Background

The RSBY caters to the largely illiterate BPL households with little financial liquidity, by introducing smart cards that provide cashless care in any of the empanelled hospitals (Basu, 2010). In collaboration with the central government, the state governments recruit insurance companies through a competitive bidding process to launch the schemes. Insurance companies are paid a premium per beneficiary household such that they have an incentive to enrol more households (up to INR 750/beneficiary household). These companies are also tasked to empanel both public and private hospitals which are compensated directly for treating RSBY registered patients. The insurance companies are responsible for the monitoring of the hospital activities to ensure quality and prevent misuse (Birdsall, 2015). In order to monitor RSBY, a quality control mechanism is in place at the national level, but actual implementation lies with states. The state government is expected to monitor the selected insurance agencies and the hospitals that are attached. To what extent state government is ensuring the monitoring and quality control is unclear. There is a grievance redressal mechanism as well, but there is scant information on who is covering this and processes thereof.

The scheme is heavily subsidized and the benefit package may be considered very generous in comparison to the small premium paid by clients. The package includes more than 700 pre-defined surgical packages for maternal and neonatal care, coverage for same-day surgeries and transport costs to and from the hospital. Providers are paid on a fee-for-service basic with packages defined for each of the covered procedures (Joint Learning Network, 2015). All pre-existing diseases are covered under the scheme (Government of India, 2015). While three quarters of the total costs are paid by the central government, the rest, including the cost of smart cards are paid by state governments. Depending on the state where the programme is being implemented, the government pays up to INR 750 per household to bridge the costs (Basu, 2010). The average subsidy per household paid by the state governments are INR 262 and INR 490 in UP and Bihar respectively (Government of India, 2015).

Insurance companies begin the enrolment process by first implementing awareness campaigns at the village level, prioritizing those with greater proportions of BPL households (based on a BPL list created in 2001). Members are provided an opportunity to renew coverage towards the end of each calendar year (Das, 2012). Since 2008 nearly 37 million BPL households have enrolled in the programme (Government of India 2014). With the enrolment process nearly complete (the scheme has been offered in 436 of 479 targeted districts), the proportions of the target group enrolled stand at 55% (Government of India, 2015). It is important to note that the enrolment proportions are likely to be overestimated as they reflect cumulative enrolment which does not take into account dropouts. The RSBY began operating in UP in December 2008, while enrolment in Bihar started nearly a year later.

The RSBY is not without criticisms. First, the list of BPL households used in enrolment procedures was created between 2001 and 2002 and is therefore likely to be outdated leading to accusations of fraud and mis-targeting (Bagcchi, 2014; Sun, 2010). Concerns regarding the programme's operations have also been raised. Though designed to be cashless, due to lower educational and socioeconomic status, the RSBY covered patients are often unable to gain enough information or are unable to exercise their rights sufficiently (Dror and Vellakkal, 2012; Nandi et al., 2012). Examples of this include the implementation of unnecessary and invasive procedures to claim money from insurance companies, and charging patients for medicines or tests allegedly not covered by the scheme. Das and Leino (2011)

point out that insurance companies are largely preoccupied with "outright" fraud prevention rather than assessing the medical necessities of the many procedures that are performed. Additionally, private hospitals were found to be reluctant to treat RSBY insured patients because the fees are considered insufficiently generous or because of disputes with insurance companies over compensation (such as delayed payment, disagreement over necessity of certain procedures) (Nandi et al., 2012; Shoree et al., 2014a).

4.2 Data

4.2.1 Data collection

The data used in this paper were collected as a part of an evaluation of three CBHI schemes rolled out in *Kanpur Dehat* and *Pratapgarh* districts in Uttar Pradesh and in *Vaishali* in Bihar. The surveys were implemented among all Self-Help Group households in the three locations.[40] Though the surveys did not collect information on BPL status, qualitative data collection suggests nearly two thirds of the sample own BPL cards and should be eligible for RSBY.[41]

The baseline survey was canvassed between March and May 2010 and covered 3,686 households (the full census of SHG related households in these districts). The follow up survey was conducted between March and April in 2012 during which 3318 households were revisited. During the same time the following year, 3307 households were re-interviewed for the third time. As some of our variables, related to insurance awareness, were only collected in the 2012 and 2013 surveys, we only use the latter two survey waves in our analyses of enrolment and dropout. The primary respondents were the SHG members themselves or the head of the household if the member was not available.

4.2.2 Variables

The household survey collected detailed information on demographic and socioeconomic status, as well as information on healthcare utilization, expenses and coping strategies for both out- and inpatient care. Given the focus on RSBY in this paper, we primarily focus on inpatient care data that was collected with a recall period of one year.

4.2.2.1 Determinants of RSBY membership and non-renewals

To model the determinants of enrolment, we use data from 2012 and 2013 that contains an indicator of whether the household was enrolled in RSBY in the specific survey wave. To analyse factors associated with dropping out, we only consider households that were enrolled in 2012 and have dropped by the subsequent wave in 2013.

[40] A self-help group (SHG) usually consists of between 10–20 poor women living in the same village who come together and agree to save a specific amount each period. The savings of all SHG members are combined and deposited in a bank or a co-operative organization. Members may borrow from the pooled savings when the SHG agrees to give the loans. SHGs are usually supported and trained by NGOs. According to Fouillet, Augsburg (2008), there are about 40 million SHG members in India.

[41] Nearly 50% of the households in our sample with RSBY membership have reported per capita household expenditures that are greater than the rural poverty line in the respective states. This could indicate either mistargeting of the RSBY scheme, or mistargeting of the BPL cards. Reports of mistargeting and corruption in the issuance of BPL cards are well documented in the existing literature (Selvaraj, Karan 2012, Nandi et al. 2013).

We consider four categories of variables as possible determinants of enrolment and dropout from RSBY (see Table 4.2 and Annex 4.1 for exact definitions). The first represents health related characteristics of the households: proportion of household members suffering from chronic illness[42] and a binary variable depicting whether any members were hospitalized in the previous year.

Table 4.2: Summary statistics of outcome variables in 2010

Definition	HH with RSBY member-ship	HH without RSBY member-ship	Test: RSBY HH=Non-RSBY HH	Test: RSBY HH=Non-RSBY HH	Test: RSBY HH=Non-RSBY HH
		Pooled Data		Uttar Pradesh	Bihar
			P-value (1)	P-value (2)	P-value (3)
Proportion of household (HH) members with chronic illnesses	0.17	0.14	0.773	0.163	0.145
Any hospitalizations in the household (1/0)	0.19	0.19	0.105	0.510	0.102
Probability of incurring expenses due to hospitalization(1/0)	0.98	0.97	0.824	0.992	0.168
Direct hospitalization expenses (INR)	12034	14020	0.214	0.210	0.440
Standard Deviation	(31846)	(33290)			
Average distance to facility (km)	27.23	37.02	0.000	0.461	0.000
Standard Deviation	(24.42)	(24.17)			
Household with debt due hospitalization (1/0)	0.86	0.80	0.104	0.370	0.089
Debt amount (INR)	8187	8328	0.894	0.243	0.951
Standard Deviation	(20096)	(15790)			

Notes: Table shows summary statistics across RSBY and non-RSBY households in 2010. P-values 1 through 3 refer to t-tests comparing means of the enrolled and non-enrolled at the pooled level and by sites.

The second category represents healthcare supply side characteristics and includes the (logarithm of the) average distance members of a community have to travel to reach a hospital.[43] Unfortunately we do not have information on whether the hospital is empanelled by RSBY in the survey.[44]

[42] Chronic conditions are defined as outpatient illnesses that have lasted longer than 30 days preceding the survey.

[43] Since respondents only report distance (in kilometres) for the providers they actually visit, we impute the distance to the nearest hospital for those households that have not used inpatient care (Borah 2006, McFadden, Train 2000, Qian et al. 2009). We estimate a log linear model on the sample of hospital users and subsequently predict the distance (Qian et al. 2009, Raza et al. 2013). Covariates used to predict the distance include household level demographic, socioeconomic and regional indicators.

[44] We attempt to match the self-reported names of the hospitals visited to the list provided in the RSBY website to get an understanding of the extent of use of such empaneled hospitals, but were only successful in matching 20% of the used hospitals (Government of India, 2015).

The third category contains household characteristics related to insurance literacy and risk aversion. We include an indicator of whether any members are enrolled in the CBHI scheme and an index depicting the understanding of insurance.[45,46] Three questions were included in the index: whether the particular household was exposed to any insurance awareness campaigns; the respondent understands the concept of premiums and insurance in general; and whether the respondent believes such schemes can be beneficial. This index is represented in the models as tertiles of scores obtained from principal component analysis of questions applicable to insurance schemes.

The fourth category relates to demographic conditions such as the sex of the household head, household members' age and sex distribution and socioeconomic characteristics including education, occupational and educational status of the household head, whether the household belongs to a scheduled caste or tribe (SCST), and tertiles of an asset index generated through principal component analysis.[47]

4.2.2.2 Effect of RSBY on the use and financing of inpatient care

After having established patterns of enrolment and dropout, we investigate whether participating in the RSBY is associated with a higher probability of any hospitalizations within the household, a lower probability of having any expenses when hospitalized, lower direct cost of the hospitalization, lower probability of resorting to debt to finance the hospitalization, and finally a lower amount of debt incurred (conditional upon incurring any debt).[48]

4.2.3 Summary statistics

Table 4.1 shows rates of enrolment and non-renewals in 2010, 2012 and 2013. Among 3,685 households surveyed in 2010, 28% were already enrolled. In 2012, 14% of the households dropped out while the total proportion of enrolled increased to 31%. A considerable shift in enrolment is noted between 2012 and 2013. The proportion of enrolled increases to 51% while dropout reduces to 8% in 2013. Over time, the differences in state-level enrolment rates diminish and (at baseline enrolment rates are 18% in UP and 41% in Bihar) the proportion of enrolled increased in UP by 2013. Although more households drop out of the scheme in Bihar in 2012 (19%) than in UP (14%), the rates are more comparable in 2013 (8% and 11% respectively). The enrolment rates at the village level vary considerably (between 7% and 78%). Overall, despite the relatively modest enrolment rates, the low drop-out rates are suggestive of the perceived positive effects of RSBY by the insured.

[45] The CBHI enrolment indicator is included as a proxy for the risk averseness of the household rather than to capture any substitution effects within the schemes given the RSBY coverage is considerably more generous and that the bulk of CBHI coverage pertains to outpatient care.

[46] In the way it is measured, insurance related awareness may be a consequence of enrolment into an insurance scheme rather than a determinant. We have confirmed robustness of results to omitting this potentially endogenous variable, and omit this variable from model 3 (described in Section 3.2) as the household fixed effects should capture awareness (to the extent that it is time-invariant).

[47] The asset tertiles includes household level characteristics such as availability of running water, toilet, electricity, roof material and the ratio of cement to dirt floors. The index also includes durable assets such as livestock, fans, radio/televisions, sewing machines, bicycles/motorcycles, mobile telephones and generators.

[48] Direct costs refer to consultation fees, costs of medicine and lab/imaging tests, net of reimbursements from any schemes such as the CBHI.

Table 4.1: Membership in RSBY

	Pooled			Uttar Pradesh			Bihar		
	2010	**2012**	**2013**	**2010**	**2012**	**2013**	**2010**	**2012**	**2013**
Enrolled (renewal and new)	0.28	0.31	0.51	0.18	0.21	0.41	0.47	0.48	0.68
Dropped out (from previous period)		0.14	0.08		0.10	0.08		0.19	0.11
Not enrolled	0.72	0.55	0.41	0.82	0.69	0.51	0.53	0.33	0.21
Households in RSBY	1048	1039	1678	415	431	874	633	608	804
Observations	*3,685*	*3,318*	*3,307*	*2,322*	*2,045*	*2,087*	*1,363*	*1,246*	*1,183*

Means of health and health care use related outcomes in 2010 among those enrolled in RSBY and those not enrolled are presented in Table 4.2 (summary statistics of outcomes in 2012 and 2013 in the pooled sample are presented in Annex 4.2). Comparing RSBY and non-RSBY households in the pooled data suggests that only the average distance to facilities significantly differs between the two groups (27km and 37km respectively). Other factors such as the proportion of members with chronic illnesses (17% and 14%) and the likelihood of hospitalization (19% for both) are do not vary across the groups. When hospitalized, almost all households, both RSBY and non-RSBY covered, incur out of pocket payments. The amount of expenses incurred by RSBY and non-RSBY households (INR 12034 and INR 14020), the probability of incurring any debt (80% and 79%) and the amount of debt do not differ significantly. State-level disaggregation suggests the significant difference in the distance to facilities across both groups to stem from Bihar. Similarly, RSBY households in this state are marginally more likely to incur debt when dealing with the expenses of a hospitalization.

A similar comparison of household level characteristics among the two groups in 2010 is presented in Annex 4.1 (summary statistics of control variables in 2012 and 2013 in the pooled sample are presented in Annex 4.3). As 2010 represents the baseline of the CBHI scheme for which the information was collected, enrolment in the CBHI scheme is missing. Similarly, information related to insurance related awareness was not collected until 2012. Regarding demographic variations in RSBY and non-RSBY households, the former have a higher proportion of working aged women (14-55 years) and a lower proportion of elderly women (55+ years).

RSBY enrolled household do appear to have lower socioeconomic status as those not-enrolled. Household heads among the non-enrolled are generally better educated (e.g., 45% of RSBY household heads have no education compared to 38% among non-RSBY) and belong to higher socioeconomic groups. Figure 4.1 shows distribution of insured households across wealth tertiles. While a clear and steep gradient is visible in Bihar where the highest proportion of enrolled households belong to the lowest asset tertile, trends in UP are not as clear (highest proportion belong to households in the middle tertile), potentially indicating problems with the targeting of the scheme (or the BPL cards) in UP. Enrolled households are more likely to belong to scheduled castes or tribes. A higher proportion of non-RSBY household heads are self-employed (43% vs 48%) whereas the opposite is true among the enrolled for casual wage labouring (32% vs 24%).

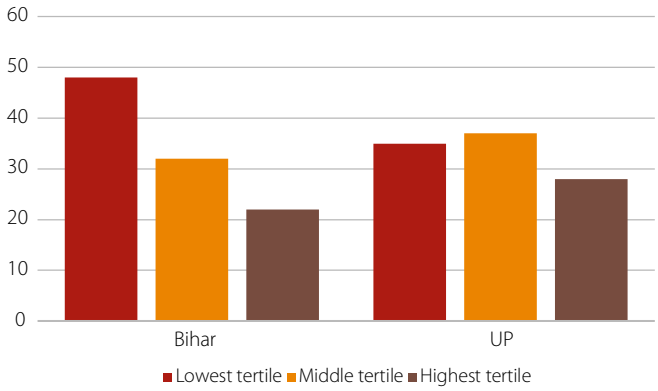

Figure 4.1: Timing of the surveys in relation to offer of enrolment

In sum, these descriptive statistics suggest relatively little differences between households enrolled in RSBY and those not enrolled, at least in 2010. This could be indicative of little problems of adverse selection, but also of little impact of the scheme. The following section describes the regression approaches used to identify the determinants of enrolment and non-renewals and to identify whether RSBY membership is associated with increased health care use and health care spending.

4.3 Empirical Strategy

4.3.1 Determinants of RSBY membership and non-renewals

We first investigate factors correlated with membership, defined as household (i) having RSBY coverage at time (*t*) in village (*v*) using the following linear probability model:

$$rsby_{itv} = \Gamma'_{itv}\beta_1 + \beta_2 D_{iv} + \Pi'_{itv}\beta_3 + X'_{itv}\beta_4 + v_v + t_t + \varepsilon_{itv} \; [i = 1,\ldots,N;\, t = 2012,2013] \quad (1)$$

where Γ'_{itv} represents a vector of health related variables, and D_{iv} represents the average distance to the hospitals. The household's insurance awareness related characteristics are captured by Π'_{itv}. A vector of socioeconomic and demographic characteristics is expressed through X'_{itv}. We control for time trends (t_t) and geographical variations through village fixed effects (v_v).[49]

The probability of not renewing the subscription in 2013 (conditional upon being enrolled in 2012), is modelled using the same explanatory variables as in equation (1), set at their 2013 values, that is:

$$Dropout_{iv} = \Gamma'_{iv}\theta_1 + \theta_2 D_{iv} + \Pi'_{iv}\theta_3 + X'_{iv}\theta_4 + v_v + \mu_{iv} \quad (2)$$

[49] We prefer village over household level fixed effects because some of the more interesting determinants, like the SCST status do not change over time. We have checked and confirmed robustness of results to using household level fixed effects (see Annex 4.4). While most results remain consistent, some differences arise for the coefficients on the insurance awareness indices and distance to healthcare facilities, which is related to their limited variation over time.

4.3.2 Associations between RSBY membership and inpatient care use and spending

We estimate the effects of RSBY membership on a battery of outcomes related to inpatient care use and spending (probability of hospitalization, probability of having healthcare spending conditional on hospitalization, log of the amount of healthcare expenses conditional on any spending, probability of incurring debt to meet healthcare expenses and the amount of debt, conditional on having any debt). For every outcome (Y_{itv}) we estimate the following linear model with household fixed effects:

$$Y_{itv} = \Omega_1 rsby_{itv} + X'_{itv}\Omega_2 + \Omega_3 \delta_{iv} + t_t + a_i + \rho_{itv} \; [i = 1,\ldots,N; t = 2010,2012,2013] \quad (3)$$

where t_t captures common time trends in healthcare use across households and a_i captures time invariant household level characteristics.[50] $rsby_{itv}$ is the key variable of interest that reflects whether the household *i* in village *v* is enrolled in RSBY at time *t*.[51]

Ω_1 identifies the effect of RSBY membership on outcome Y_{itv} under the assumption that there are no time-varying unobservables that correlate with both RSBY membership and the outcomes of interest. Given the targeting of the program to BPL households, and our inability to perfectly control for BPL status, and the voluntary nature of the program, this is a strong assumption. We expect our rich set of covariates to largely capture the self-selection into the program, especially because the program is highly subsidized and therefore attractive to the large majority of households.[52] To reduce the potential bias due to unobserved differences in socioeconomic characteristics that arise from the targeting of the program, we test sensitivity of our results by restricting the sample to the bottom two wealth thirds.[53] It should be stressed though that our identifying assumptions might be violated, and we therefore interpret our results as associations rather than causal impacts.

Robustness of results is confirmed using non-linear specifications for the binary outcomes (results available upon request). All analysis was done using STATA version 13.0.

4.4 Results

4.4.2 Determinants of enrolment

Table 4.3 shows coefficients of the OLS model examining factors associated with enrolment in RSBY in 2012 or 2013. We find that the proportion of household members with chronic illness is positively correlated with the probability of being enrolled in RSBY (6pp). There is a negative correlation between distance to healthcare facilities and enrolment at the pooled level with a 1% increase in the distance

[50] As we are less interested in the coefficients on the household level covariates, we prefer using household fixed effects rather than village fixed effects as the former allow capturing more of the unobserved household level heterogeneity that may bias our coefficients on the RSBY variable.

[51] Note this is different from difference-in-differences models in the sense that we use both households that enroll and drop out from one year to another as 'treatment' households, and those that are enrolled throughout or never enrolled as controls.

52 Limiting the sample to those not enrolled in 2010 would not be particularly helpful in addressing the sample selection problem, because we do not know whether households have never enrolled, or have dropped out recently.

[53] Qualitative data collection suggests that around two-thirds of our sample should possess a BPL card.

reducing the probability of enrolment by 1pp. Insurance awareness is positively associated with RSBY membership (3pp). Households in the highest tertile of the index are 3pp more likely to be enrolled. Similarly, households who joined CBHI schemes are also more likely to be enrolled in RSBY (3pp), potentially indicating higher aversion to risk.

Table 4.3: Determinants of RSBY membership in 2012 and 2013

Variables	Pooled		Uttar Pradesh		Bihar	
	Marginal effects	Standard error	Marginal effects	Standard error	Marginal effects	Standard error
Proportion of household members with chronic illnesses (% of household)	0.056**	0.027	0.030	0.034	0.097**	0.046
Log of average Distance from facility	-0.008*	0.005	-0.010	0.030	0.004	0.016
Low insurance index score(1/0)	-0.010	0.035	-0.001	0.042	-0.038	0.063
High insurance index score (1/0)	0.026**	0.012	0.028*	0.015	0.019	0.021
Enrolled in CBHI(1/0)	0.032*	0.016	0.038*	0.021	0.016	0.027
Lowest asset tertile (1/0)	-0.006	0.015	-0.014	0.019	0.001	0.025
Highest asset tertile (1/0)	-0.039***	0.014	-0.028*	0.017	-0.058**	0.028
Household belongs to a scheduled tribe/caste (1/0)	0.070***	0.014	0.069***	0.017	0.077***	0.026
Primary education (1/0)	-0.034*	0.019	-0.015	0.023	-0.071**	0.032
Secondary education (1/0)	-0.042***	0.016	-0.026	0.020	-0.069**	0.028
Higher secondary education (1/0)	-0.060***	0.023	-0.014	0.027	-0.169***	0.044
Other employment (1/0)	-0.016	0.025	0.007	0.030	-0.065	0.048
Casual wage labourer (1/0)	0.023	0.016	0.028	0.020	0.012	0.026
Not working (1/0)	-0.010	0.025	-0.035	0.028	0.068	0.050
Doing housework (1/0)	-0.021	0.021	-0.016	0.026	-0.029	0.036
Female headed household (1/0)	0.009	0.020	0.012	0.025	0.013	0.033
Household size	0.011***	0.003	0.010***	0.004	0.016**	0.006
Female 0 to 13yrs (1/0)	-0.103**	0.048	-0.108*	0.060	-0.084	0.083
Female older than 55 (1/0)	-0.131***	0.050	-0.125**	0.059	-0.140	0.097
Male 0 to 13yrs (1/0)	-0.139***	0.047	-0.145**	0.058	-0.141*	0.082
Male 14 to 55yrs (1/0)	-0.037	0.048	-0.053	0.057	-0.006	0.090
Male older than 55 (1/0)	-0.025	0.072	0.033	0.085	-0.157	0.133
Year: 2012	0.215***	0.013	0.219***	0.016	0.207***	0.022
Observations	*6,367*		*4,085*		*2,282*	

Notes: Table shows marginal effects of OLS models using village level fixed effects. The binary dependent variable whether a household is enrolled in RSBY in 2012 or 2013. Joint significance tests for the village dummies found to be significant at the 1% level for all models. *, **, *** indicate significance at the 10%, 5% and 1% respectively.

Associations between socioeconomic variables and RSBY membership confirm the pro-poor targeting of the scheme. Households in the highest asset tertile are 4pp less likely to be enrolled compared to those in the middle. Members of scheduled castes or tribes (SCST) are more likely to enrol in the programme (7pp). Household heads with primary secondary or higher-secondary education, are less likely to be enrolled (3pp, 4pp and 6pp respectively).

Regarding demographics, we find that larger households are more likely to enrol (1pp), which likely is related to the premium not rising with household size (up to 5 members). Interestingly, households with a higher proportion of children or older women are less likely to be enrolled.

There appears relatively little variation in these associations across states. Factors such as the insurance awareness and CBHI membership only play a part in enrolment decisions among households in UP (3pp and 4pp respectively). Any education among household heads is only negatively associated with enrolment in Bihar (7pp for primary, 7pp for secondary and 17pp for higher-secondary education). As already expected from Figure 1, RSBY membership, conditional on other characteristics, is more concentrated among the poor in Bihar as compared to UP.

4.4.3 Determinants of non-renewals

Table 4.4 presents results from an OLS model analysing the determinants of not renewing RSBY membership in 2013, conditional upon being enrolled in 2012. Households with members who are chronically ill are much less likely to drop out. An increase in the proportion of chronically ill members (by 1pp) reduces the probability of non-renewal by 12pp. Households belonging to SCST are also less likely (12pp) to drop out from the RSBY. Lastly, household size is negatively associated with the likelihood of dropping out at the pooled level (3pp).

Variation across states is once again limited. Adverse selection is more pronounced in Bihar, while there is no significant correlation between the proportion of household members with a chronic illness and RSBY dropout in Uttar Pradesh. Overall, we find fewer significant effects in models of dropout as compared to those of enrolment, which might be related to the relatively low drop-out rates and smaller sample size. The presence of chronic illnesses, being a member of SCST and household size play a positive role in both enrolling and remaining in the scheme. Factors such as average distance from inpatient facilities, understanding of insurance, wealth and household demographics are related to enrolment but are not significantly related to of the probability of dropping out of RSBY.

4.4.4 Associations between RSBY membership and inpatient care use and spending

Table 4.5 presents results on the changes in health care use and spending that are associated with RSBY membership. The first row of results shows effects on the probability of hospitalization within a household over the preceding year. This is followed by the effects on the likelihood of incurring any expenses, and the amount spent, both conditional upon being hospitalized. We further investigate whether participation precipitates any change in the probability of incurring debt due to this hospitalization and the amount of debt, conditional on borrowing.

Table 4.4: Determinants of non-renewals in 2013

Variables	Pooled		Uttar Pradesh		Bihar	
	Marginal effects	Standard error	Marginal effects	Standard error	Marginal effects	Standard error
Proportion of household members with chronic illnesses (percent of household)	-0.118*	0.067	0.008	0.120	-0.195**	0.078
Any hospitalizations in the household (1/0)	0.048	0.041	0.081	0.075	0.047	0.048
Log of average Distance from facility	0.019	0.030	0.070	0.111	0.022	0.031
Low insurance index score(1/0)	0.037	0.142	-0.109	0.289	0.083	0.158
High insurance index score (1/0)	-0.012	0.030	0.021	0.054	-0.031	0.035
Enrolled in CBHI(1/0)	-0.006	0.040	-0.015	0.072	-0.003	0.048
Lowest asset tertile (1/0)	0.038	0.036	0.052	0.068	0.017	0.041
Highest asset tertile (1/0)	0.045	0.037	0.051	0.060	0.042	0.048
Household belongs to a scheduled tribe/caste (1/0)	-0.120***	0.034	-0.139**	0.057	-0.113***	0.044
Primary education (1/0)	0.071	0.046	0.090	0.083	0.051	0.055
Secondary education (1/0)	-0.017	0.039	-0.019	0.067	-0.014	0.048
Higher secondary education (1/0)	0.070	0.060	0.059	0.093	0.059	0.087
Other employment (1/0)	0.005	0.076	-0.029	0.120	0.026	0.104
Casual wage labourer (1/0)	0.034	0.038	0.017	0.071	0.051	0.045
Not working (1/0)	0.022	0.065	0.195*	0.114	-0.094	0.077
Doing housework (1/0)	0.033	0.050	-0.008	0.094	0.046	0.058
Female headed household (1/0)	-0.053	0.047	-0.007	0.087	-0.059	0.055
Household size	-0.028***	0.009	-0.041***	0.014	-0.018	0.011
Female 0 to 13yrs (1/0)	0.122	0.121	0.312	0.210	0.027	0.153
Female older than 55 (1/0)	0.118	0.145	-0.047	0.257	0.210	0.174
Male 0 to 13yrs (1/0)	0.091	0.120	0.229	0.210	0.018	0.149
Male 14 to 55yrs (1/0)	-0.14	0.134	-0.12	0.223	-0.15	0.170
Male older than 55 (1/0)	0.125	0.202	-0.156	0.338	0.338	0.256
Observations	*956*		*408*		*548*	

Notes: Table shows marginal effects of OLS models using village level fixed effects. The binary dependent variable shows whether the household did not renew its subscription to the RSBY in 2013, conditional upon being enrolled in 2012. *, **, *** indicate significance at the 10%, 5% and 1% respectively.

Table 4.5: Associations between RSBY membership and inpatient care use and spending

	Pooled		UP		Bihar	
	Coefficient	**Standard error**	**Coefficient**	**Standard error**	**Coefficient**	**Standard error**
Probability of hospitalizations (1/0)	0.000	(0.010)	-0.010	(0.013)	0.015	(0.017)
Observations	*10,125*		*6,359*		*3,766*	
Probability of having healthcare expenses conditional on use (1/0)	0.007	(0.026)	0.001	(0.042)	0.007	(0.031)
Observations	*1,413*		*836*		*577*	
Log of healthcare expenses conditional on spending (INR)	-0.056	(0.170)	0.224	(0.296)	-0.361*	(0.190)
Observations	*1,361*		*804*		*577*	
Probability of debt conditional on use (1/0)	0.061	(0.058)	0.059	(0.085)	0.017	(0.083)
Observations	*1,413*		*836*		*577*	
Log of the amount of debt conditional on borrowing (INR)	-0.078	(0.206)	0.251	(0.353)	-0.547**	(0.232)
Observations	*1,100*		*643*		*457*	

Notes: Table shows coefficients of OLS models using household level fixed effects. Logged forms of healthcare expenses and the amount of debt are used in the respective models. *, **, *** indicate significance at the 10%, 5% and 1% respectively.

RSBY membership is not significantly associated with the likelihood of hospitalization or the likelihood of positive spending within a household, the latter most likely related to high likelihood of having expenses at baseline. This is true for the pooled sample, and for both of the state specific samples. We do however find RSBY membership to be associated with a reduction in OOP spending in Bihar (36%). RSBY households in Bihar concurrently experience a 55% reduction in the amount of debt incurred in dealing with the cost of hospitalization. We find no significant effects on financial protection in UP. We carry out additional sensitivity analysis by restricting the sample to households in the bottom two asset tertiles. Results in general are comparable and are presented in Annex 4.5.

4.5 Discussion and concluding remarks

The Government of India (GoI) initiated Rashtriya Swasthya Bima Yojana (RSBY) in 2008 to provide inpatient insurance coverage to below-poverty-line (BPL) households in India. To date, the RSBY provides coverage to nearly 37 million BPL households across all 29 states. This paper examines three aspects of the programme taking place in the Uttar Pradesh (UP) and Bihar states of India. Using household level panel data, we first examine determinants of enrolment into RSBY followed by the determinants of

dropping out of the scheme. Lastly, the paper investigates whether RSBY membership is associated with increases in hospitalization rates and decreases in spending on inpatient care.

By 2013, more than half of our sample is enrolled in RSBY (51%). We do not have information on BPL status, but would expect about two-thirds of our sample to have BPL status, which would mean that coverage of RSBY in these states is reasonably high. While we do find coverage to be more concentrated among the poorest, the socioeconomic gradient is very weak in UP. This could be related to either some mistargeting of RSBY or mistargeting of BPL cards. Our findings correspond with observations made in similar studies. Sun (2010) for example speculated that the fact that the BPL list had been created nearly a decade prior to the launch of the RSBY considerably increased the potential for mistargeting. Subsequently, evidence of leakage was found by both Nandi et al. (2013) and Bagcchi (2014).

Analysis of the determinants of enrolment into the scheme reveals several insights. Firstly, the positive correlation between existing chronic conditions and enrolment suggests problems of adverse selection which might threaten sustainability of the scheme. The programme's pro-poor targeting is reflected in a higher concentration of poor wealth groups, lower educated households and SCST households among the enrolled. Insurance related awareness plays a considerable role in the household's decision to join the scheme. Additionally, we find enrolment rates vary considerably across villages (ranges between 7% and 78%), which might reflect geographical factors or variation in the efficacy of the RSBY partners (insurance companies) in enrolment activities. Distance to the nearest facility is negatively correlated to the likelihood of enrolling in the scheme. This indicates that the insured are indeed sensitive to accessibility and quality of care. Strengthening the health infrastructure by improving its quality and access will likely encourage more eligible households to join.

We find that the drop-out rates among RSBY households are relatively low (11% on average), suggesting that the program is considered to offer good value for (a limited amount of) money. Households with chronic illnesses are less likely to drop-out, further suggesting problems of adverse selection. SCST households are more likely to retain their membership.

We do not find RSBY membership to be associated with an increased likelihood of using inpatient care. The association between RSBY membership and financial protection appears to differ across the states. While no effects are seen among RSBY households in UP, insurance coverage is associated with a substantial reduction in OOP (36%) and the amount of debt incurred (55%) in Bihar. This contradicts the findings of an earlier study focusing on Andhra Pradesh, Karnataka and Tamil Nadu by Selvaraj and Karan (2012), who find that that weak scheme administration, lack of effective operational oversight and absence of accountability mechanisms led to increased expenses in inpatient care. This difference in results is likely driven by the fact that each state has a heterogeneous number of players and methods of implementation. The larger effect in Bihar, as compared to UP, could be related to the development efforts by the Bihar government since 2005.[54] These efforts include attempts to improve upon and enlarge access to basic services such as transportation and primary, secondary and vocational education

[54] The departments heading the RSBY in Bihar (DoHFW) and in UP (DoRD) were different, thereby leading to line management differences in the initial implementation. Subsequently, RSBY in UP was implemented by DoHFW. Secondly, political governance and administration has had different trajectory in Bihar as compared to UP, with the latter facing scams involving National Rural Health Mission and its repercussions on community perceptions. In Bihar, the government ownership to RSBY at the district-level was relatively higher than UP. These observations were communicated by the field-partners and some officials engaged with the implementation of RSBY.

(Singh, Stern 2013). Most importantly, the development efforts placed considerable focus on health through upgrading of health infrastructure and manpower, outsourcing diagnostic facilities, providing access to free medication, provision of emergency services, and maintenance of accountability through web-based monitoring (Planning Commission 2007).

Despite the positive effect on financial protection in Bihar, confirming the findings of Devadasan et al. (2013), we find that the programme does not provide cashless access to inpatient care. We find the probability of incurring any expenses for hospitalization to be close to one in both states for the whole sample. This might be related to RSBY not covering the full costs of treatment given to insured patients, or to problems of awareness among the low SES target group of RSBY.

There are some limitations to this paper. First and foremost, the surveys did not collect information regarding the respondent households' BPL status and the duration of enrolment in the RSBY. We are unable to ascertain whether the respondents, when hospitalized, in fact sought care from RSBY empanelled institutions. The data on which the paper is based were collected to gauge the impact of a CBHI scheme and is restricted to SHG households. Furthermore, as we have a relatively small sample of households which experienced hospitalization, models that are conditional on use may have low statistical power. RSBY was clearly not rolled out in a randomized way. While we do control for a rich set of observable characteristics and household fixed effects, there may still be unobservable time-varying characteristics that correlate with both the uptake of RSBY and the need for inpatient care. Notwithstanding these limitations, our study concludes that RSBY is indeed pro-poor, but there is evidence of adverse selection which might jeopardize long term sustainability. While insured households still need to make OOP payments for inpatient care in both states, RSBY is associated with increased financial protection in Bihar.

RSBY has the potential to contribute to India's move towards UHC. A further, more qualitative investigation, of the differences in RSBY implementation and management across the two states will provide useful insights on how to improve effectiveness of RSBY in UP. The focus on inpatient coverage might be a further point of concern. It is likely that generous inpatient care coverage in the absence of outpatient coverage might lead to inefficient and unnecessary use of hospital care.[55] Like many LMICs India is experiencing an epidemiological shift towards non-communicable diseases (Quigley, 2006), and the management of such conditions, typically through outpatient based care, has been found to represent one of the largest shares of households' health related expenditures (Dror and Vellakkal, 2012) India's Labour Ministry launched a hospital insurance scheme called Rashtriya Swasthya Bima Yojana (RSBY. Moving forward to UHC will therefore also have to entail an extension of outpatient care coverage, either through RSBY or separate schemes (Dror and Vellakkal, 2012)India's Labour Ministry launched a hospital insurance scheme called Rashtriya Swasthya Bima Yojana (RSBY. Improving the targeting of RSBY, through a revision of the BPL list, should also rank high on the policy agenda.

[55] Lessons from the Chinese New Cooperative Medical System for example suggests the absence of outpatient coverage is likely to increase incidences of out-of-pocket payments and reduce impact on financial protection (Wagstaff et al., 2009)

Part II

Integrated approach to ultra-poverty alleviation

Chapter 5

Impact and spill-over effects of an asset transfer program on malnutrition: Evidence from a randomized control trial in Bangladesh

In Collaboration with: Ellen van de Poel

5.1 Introduction

Extreme poverty is widespread and persistent in Bangladesh with more than a third of the population living under $1.25/day. In response, *Challenging the Frontiers of Poverty Reduction* (CFPR) programme was launched by BRAC. The programme provides income generating assets, multifaceted training on entrepreneurial activities, health, nutrition, social and legal awareness over a period of two years with the aim of merging them with the mainstream poor.[56] A number of studies have investigated the effects of CFPR on the programme's main intended outcomes such as income, asset holdings and occupation. They report strong positive short and long run impact of participation on income, productive asset holdings during the first phase of the programme using quasi-experimental methods (CFPR I: 2002-2006) (Emran et al., 2014; Misha et al., 2014; Prakash and Rana, 2006; Raza et al., 2012).[57] The second phase of the programme (CFPR II: 2007-2011) uses a randomized control trial (RCT) design to generate robust evidence on impact as well as its spill over effects.[58] Results derived from this phase of the programme are comparable to the first (Bandiera et al., 2013; Das et al., 2009). Bandiera, Burgess et al., (2012) is the only study to report on the avenues and magnitudes of the spill over effects of CFPR II at the community level. The programme has received wide acclaim and is being replicated across 20 countries.[59]

To the best of our knowledge, there is no evidence on the programme's impact on secondary outcomes like malnutrition. While beneficiaries were given information on healthy lifestyles and good nutrition, especially for children, there were no transfers in terms of food. Establishing the effects of such an anti-poverty programmes on malnutrition is important, especially given the relatively high and persistent malnutrition rates in the country. Malnutrition is a major contributor to child morbidity and mortality in Bangladesh (Rahman et al., 2009).[60] Nearly 39% of children younger than 5 in rural Bangladesh are underweight while 28% of women report thinness (body mass index [BMI] <18.5) (National Institute of Population Research and Training (NIPORT) et al., 2013).[61] Inadequate nutrition increases the probability of contracting infectious diseases, stifles cognitive development and leads to growth faltering for children under 5 (Black et al., 2008; Haddad, 2003; Venis, 2003; World Health Organization, 2013). Malnourished adults are susceptible to chronic illnesses such as high blood pressure, diabetes and heart diseases while economic costs can add up to 10% of lifetime earnings (Horton and Steckel, 2013;

[56] BRAC considers individuals earning USD $0.60-$0.70 per day to be ultra-poor (BRAC, 2013).

[57] Income in the short run for example experienced a 56% increase over the baseline. While the difference continued to increase over the mid-run, it stagnates in the long term driven mostly by the catch-up among the control group (33% over the baseline) (Misha et al., 2014)providing multifaceted support in the form of asset-transfer, food-stipends, education, healthcare and social support for two years. Utilizing a four-round panel data spanning 9 years and combining regression and propensity score weighting, we evaluate CFPR\u2019s short and long term impact on income, employment, social status, food security and asset ownership. While remarkable effects of CFPR are evident in short and medium-term (up to 6 years since baseline. For other outcomes such as food intake, Haseen and Sulaiman (2007) find that programme participation led to both an increase in mean calorie intake from 1750 to 2138 per day, and in the quality of the calories consumed.

[58] CFPR I reached approximately 100,000 households while CFPR II was scaled up to encompass nearly 800,000 households.

[59] Banerjee et al (2015) perform RCTs across six of these locations and find that driven by the rise in income, the programme produces significant and cost-effective impact on consumption and improves the psychological conditioning of the participants.

[60] Nearly 37% of children under 5 are undernourished worldwide, the highest concentrations in South Asia and Africa (UNICEF, 2012).

[61] Indication of long term malnutrition (stunting) for example in Bangladesh and Nepal are 41% compared to 44% in Pakistan and 48% in India. (Chowdhury et al., 2013; UNICEF, 2013)

Hunt, 2005; Saunders and Smith, 2010). Further discussion of the consequences of malnourishment are available in Isabel and Correla et al., (2003).

Malnutrition is largely driven by poor maternal and child care practices, food insecurity and unsafe public health conditions (Gartner et al., 2005; World Health Organization, 2013). Exclusive breastfeeding plays a crucial role in determining early childhood nutrition status. In Bangladesh, while nearly all mothers initiate breastfeeding soon after birth, the average duration of exclusive feeding however is 3.5 months, which is below the recommended WHO average of 6 months. Infectious diseases such as diarrhoea, malaria, pneumonia, and acute respiratory illnesses among children can diminish the absorptive capacities of vital nutrients leading to malnutrition and remains a major cause of morbidity (Brown, 2003). Though the prevalence of such diseases have dramatically reduced over the past decade and are now responsible for only 2 percent of under-5 deaths, the rate remains at 49 (per 1000 live births) despite the 50% decline over the past two decades. Nearly 99% of the rural population in Bangladesh has access to improved sources of drinking water such as a piped water source, tube wells or protected springs. The use of safe sanitary facility such as with a running flush, pit latrine and composting toilet is however restricted to only a third of the rural population (National Institute of Population Research and Training (NIPORT) et al., 2013). Though not considered the primary focus of CFPR, the health component of the programme targeting the aforementioned pathways could be expected to impact nutritional outcomes. In addition to facilitating access to sanitary facilities to the participants, the CFPR raised awareness on healthy behaviours (breastfeeding, handwashing), and provided participants with easier access to primary health care.

The health impact of CFPR is likely to extend to non-participants living in the targeted districts, either through economic spill-overs as identified in previous research (Bandiera et al., 2013), or through behavioural factors such as prolonged breastfeeding and increased hygiene practices. A considerable number of studies have drawn attention to the spill-over effects of anti-poverty programmes. PROGRESA (later renamed Oportunidades), a conditional cash transfer programme targeted at poor Mexican households, was found to have substantial impact on consumption of food and non-food items, asset ownership and increased schooling. Important spill-over effects of PROGESA have been identified on consumption[62] (Angelucci and De Giorgi, 2006), asset ownership (Barrientos and Sabatés-Wheeler, 2011), schooling (Bobonis and Finan, 2002) and preventive care (Bouckaert, 2014).

This study uses a two wave panel dataset from a randomly rolled out CFPR II programme across 13 of the poorest districts in Bangladesh. We first evaluate the impact of the CFPR on the nutritional status of participant household members, and subsequently investigate spill over effects on non-participants. We distinguish between spill-over effects on the poor and non-poor. As gender inequality is high on the policy agenda in Bangladesh and the impact of anti-poverty programmes has been linked to the gender of the main recipients (Berger, 1989), we investigate the heterogeneity of impact across sex of the household head and the sex of the household member. Lastly, we identify potential pathways of both the main effects and spill-over effects. This paper adds to several strands of the literature. It is the first paper to look at the nutritional impact of such a large scale ultra-poverty alleviation programme.

[62] Magnitudes of effects on the non-treated are typically a third of the average treatment effects when it comes to consumption and more than a fifth for asset holdings (land and livestock). Magnitudes of spill-over effects for preventative care varies between 12% and 80% of the main impact across outcomes.

Second, it adds to the understanding and pathways of spill-over effects on non-beneficiaries of such programmes.

In the next section, we first describe the CFPR programme. This is followed by a description of the dataset and identification strategy. Thereafter results are presented and discussed, after which concluding remarks and policy recommendations are made.

5.2 CFPR Programme and pathways of spill-over effects

Evidence shows that NGOs traditionally find it challenging to reach the ultra-poor for various interventions as they typically lack the skills and the means to participate in such programmes (Hashemi and Rosenberg, 2006; Navajas et al., 2000). To explicitly reach this elusive population, the CFPR uses a three-step targeting procedure. Geographic selection, based on the World Food Programme poverty map, is first carried out to identify the poorest sub-districts of the country. Post-selection, BRAC officials from these sub-districts scope their respective areas and identify the most vulnerable areas within the communities. The last step combines the use of wealth ranking exercises (WRE) (see Participatory Rural Appraisal for details (Chambers, 1994)) and surveys in each of the communities to identify ultra-poor households. All households within each of the communities are then divided into 5 to 6 relative wealth ranks. Households in the bottom rank are considered the poorest and are subject to verification surveys to ensure eligibility.[63]

CFPR eases the innate restrictions of a resource and skill poor household through the provision of income generating assets[64] valued at approximately USD $140 and a comprehensive livelihood development training programme to encourage entrepreneurship. Once selected, the participants enrol in the programme for two years. During this time, in addition to regular hands on training in maintaining the assets and developing entrepreneurial skills, the participants develop skills in education, social and political awareness, health and nutrition through bi-weekly training sessions with a BRAC programme official. The households in addition receive a small weekly sustenance allowance during the first year to counter potential opportunity costs.

Association with CFPR grants the participants access to the Essential Health Care package that includes health and nutrition education that covers topics such as importance of exclusively breastfeeding until the 6th month, child immunization, pregnancy care, oral rehydration therapy, provision of basic curative care for common illnesses at cost, or free if the patient is unable to pay, and the delivery of DOTS (Directly Observed Treatment, Short course) for tuberculosis patients. The rationale behind these components is to develop health awareness, change "unfelt need" to "felt need" and control disease transmission. All training sessions are done on a one-to-one basis, usually within the confines of the participant's home.

[63] The inclusion criteria include (3 of 5 have to be met): Household owns less than 10 decimals of land; Main source of income is by female member begging or working as domestic help; no active male adult (female household head); School-aged children working for pay; No productive or income generating assets. The exclusion criteria, of which all have to be met, include: No Active female member in the household; Microfinance participants; Household members receiving government benefits such as old age pensions.

[64] These assets typically comprise of some combination of cows, goats, poultry or vegetation nurseries that best suited for the capacity of the participant and local conditions such as access to grazing grounds.

The CFPR creates an influx of agricultural assets in the treated communities, precipitates a shift in the hours devoted from wage to self-employment among the poorest women in the community, and increases self-employment output (e.g. milk, eggs) in the local markets. Bandiera et al. (2012) purport this causes spill-over effects in local wages, output and livestock prices, leading to changes in the local market equilibrium. The spill-over effects studies in this paper are more behavioural in nature and we hypothesise pathways through which this may occur. As the CFPR revolves around repeated dissemination of messages through in-depth and repeated training sessions on various topics to ensure information retention. Social networks and the "word of mouth" are quite fluid in rural communities and information is transmitted through households within similar socioeconomic strata (Banerjee et al., 2013; Scott, 2012). The importance of the knowledge gained through interventions results in explicit or implicit signalling by participants and its subsequent effects can instigate "demonstration effects" among non-participating households (Handa et al., 2001; Miguel and Kremer, 2004). While non-participant households do not receive direct transfers of goods, services or knowledge, information on nutrition, health and overall well being acquired by participants are easily transmitted among neighbours. As a proxy for these pathways, we investigate the effects on intermediary outcomes among the non-participants.

5.3 Data and methods

5.3.1 Evaluation design and data collection

The data for the study was collected from 40 BRAC field level branches encompassing 13 of the poorest districts in Bangladesh.[65] Once the decision was reached as to which branches within the districts would receive the intervention, the evaluation team randomly selected 20 sub-districts with at least two branches. Using pair-wise randomization, each was randomly assigned as treated or control branch. Each of the branch offices within the sub-districts typically operate within a 5km radius while the branches on average are 12km apart.

Prior to the randomized assignment to treatment or control, wealth ranking exercises were carried out in each branch and final selections were made. To prevent anticipation effects, none of the surveyed households in either the treated or control area was aware of the CFPR at baseline. The control groups were oblivious to its existence until 2011, at which point they also were enrolled. Three groups of people were surveyed in each of the locations: (i) the ultra-poor (UP), (ii) the other-poor (OP), that is, those who were primarily selected during the WRE but later disqualified during the verification surveys and (iii) the non-poor (NP). The average treatment effects on the treated are identified by comparing the UP across treated and control communities. Spill-over effects are derived through the comparison between OP and the NP individuals across treated and control districts.

Pre-intervention data from 2007 amasses information from 23,417 individuals (7,817 households) from UP households, 43,575 individuals (12,551 households) from OP households and 28,345 individuals

[65] Baseline survey branches were from 13 districts (Chapainobabgonj, Kishorgonj, Madaripur, Naogan, Netrokona, Sherajgonj, Thakurgaon, Ponchogorh, Nilphamari, Lalmonirhat, Kurigram, Gaibandha and Rangpur).

(6,609 households) from NP households in treated and control areas.[66] Attrition over the course of four years (17%, 16% and 15% respectively among UP, OP and NP households) led to a balanced panel of 19,427 individuals in UP households, 36,476 members in OP households and 24,096 individuals in 2009. The primary respondent was the main female member of the household. All surveys were conducted between April and December in each of the respective years. Further details are available in Table 5.1.

Table 5.1: Sample

Category	Baseline sample (individuals [households])	Additions†	Attrition	Balanced panel (individuals)
Ultra-poor	23417 [7817]	4187	3990	19427
Other-poor	43575 [12551]	7824	7099	36476
Non-poor	28345 [6609]	5984	4258	24096

Notes: Table shows sample details of population groups. † Individuals added on to households within the groups by the way of marriages or births.

5.3.2 Variables

Survey instruments collected information on height, weight, sex and age (in months for individuals under 5, in years for above) on all members of the household.[67] We categorize our sample following the WHO reference population guidelines: 0 to 5 years; 6 to 19 years and 19+ years.

Anthropometric outcomes for children (under 5) are calculated using the WHO 2006 growth standards (Borghi et al., 2006). We calculate height-for-weight (WHZ), weight-for-age (WAZ) and height for age (HAZ) z-scores(de Onis et al., 2007; World Health Organization, n.d.) and consider children with z-scores below -2 standard deviations (SD) from the median of the reference population as respectively wasted, underweight and stunted (World Health Organization, 2010). Wasting indicates acute malnutrition, stunting reflects chronic malnutrition and underweight a combination of both acute and long term malnutrition (Borghi et al., 2006; Group, 1986; World Health Organization, 2010). Following the WHO recommendation, for the 6-19 years age group we use body mass index (BMI) z-scores, and an indicator of thinness (z-score below -2 SD) instead of the WHZ z-score and binary indicator. For adults older than 19 we use continuous BMI as a measure of nutritional status, and indicators of moderate and severe thinness defined as BMI below 18.5 and 17 respectively (Garrow and Webster, 1985; NIPORT, 2013).

We follow the UNICEF (1990) nutrition framework to identify the most important determinants of nutritional status. The framework suggests insufficient breastfeeding, vitamin A and iron deficiencies among infants and children contribute to a low nutrition status. Infectious diseases such as diarrhoea, malaria, pneumonia, and acute respiratory illnesses among children can diminish the absorption capacities of vital nutrients leading to malnutrition (Brown, 2003). For adults, the framework suggests the combined effects of food insecurity, ill health and poor public health conditions culminate in

[66] See Table 5.2 for age-specific sample sizes.

[67] Recumbent supine length was collected for children under 24 months of age.

malnutrition. Using this framework as a guide, we assess the impact of CFPR on a number of intermediary outcomes that are hypothesized to affect the nutritional status of members in participant and non-participant households: initiation and duration of exclusive breastfeeding[68], vitamin A supplementation (for children aged between 6 to 59 months), and disease prevalence in the15 days preceding the survey. For children, information is collected on symptoms reflecting diarrhoea, malaria, pneumonia and acute respiratory illness, while for adults we use an indicator for any illness. General attributes of the household included whether the household has access to sanitary latrines and safe drinking water.

5.3.3 Baseline characteristics

Table 5.2 shows baseline means of outcomes of interest across the various groups. Columns 1 and 2 show means of individuals in UP households in treated and control areas followed by their normalized differences in Column 3. Normalized differences are calculated as the difference in means divided by the square root of the sum of their variances. Imbens and Wooldridge (Imbens and Wooldridge, 2009) proposed this scale free measure as an alternative to using t-tests that increase mechanically with sample sizes. Authors suggest that only normalized differences above 0.25 are likely to be sensitive to specification changes. Columns 4 and 5 show outcome means across treated and control areas for individuals in OP households followed by their scale-free differences in Column 6. Outcomes appear to not significantly differ across treated and control areas among all age groups, suggesting that randomization was successful in creating similar groups. We generally expect members in OP households to be less malnourished given their higher socioeconomic status.

Panel A in Table 5.2 show corresponding baseline averages for the 6 to 19 years population, indicating similar degrees of malnutrition. While nearly a quarter of the sample across all groups are moderate to severely thin, nearly 40% are stunted. Panel B of Table 5.2 shows means of the BMI for adults and the likelihood of moderate and severe thinness. Trends show that nearly 2/3rd of the adults are moderately thin while a third are severely thin (summary statistics in 2011 are presented in Annex 5.3).

The evaluation instrument collected detailed information related to demographic characteristics such as composition of the household, sex of the household head and the household size. Socioeconomic information detailed on education and employment status of all household members including sources of income with a recall period of 12 months. Detailed information on assets (land, livestock, and cash saving) were collected (see Annex 5.4). Comparison of baseline means show a higher probability of an UP household head working as a casual day labourer in treated areas than as control (46% versus 30%). None of the other characteristics were significantly different from each other. Similarly for OP households, none of the differences in the covariates significantly differed between treated and control areas.

[68] The information was collected in days for less than one months and the number of months thereafter. For this study we convert the months to days by multiplying the number by 30.42.

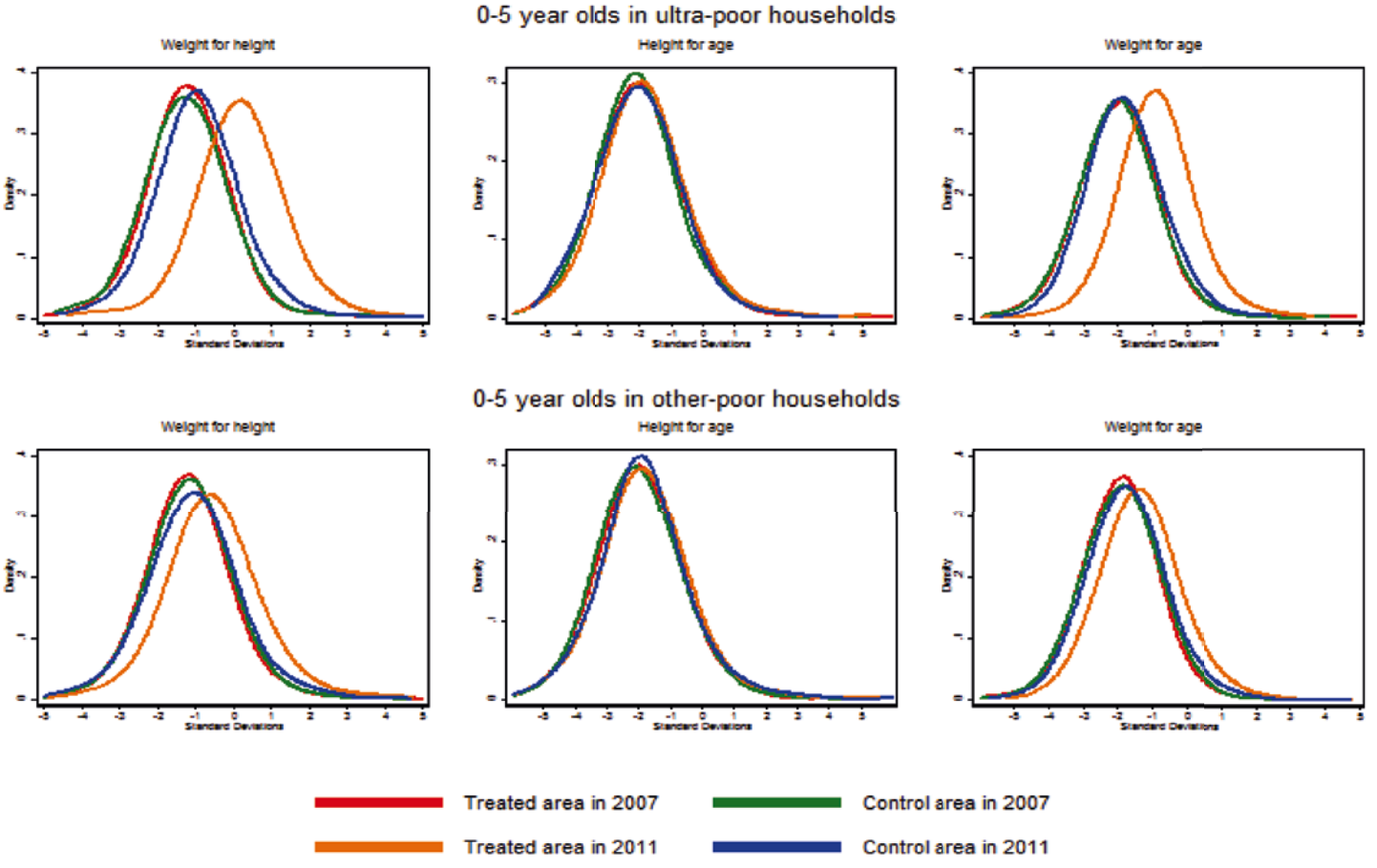

Figure 5.1: Trends in anthropometric indicators for children under-5 years in ultra-poor and other-poor households across treated and control areas

Table 5.2: Baseline summary statistics of outcome variables

	Ultra-poor households			Other-poor households		
	Treated areas	Control areas	Normalized differences	Treated areas	Control areas	Normalized differences
	1	2	3	4	5	6
Panel A: 6 to 19 years						
Body mass index (BMI in SD)	-1.37	-1.35	-0.02	-1.34	-1.28	-0.06
Thinness (BMI< -2SD) (1/0)	0.26	0.24	0.03	0.24	0.22	0.04
Height for age (HAZ)	-1.63	-1.69	0.05	-1.53	-1.55	0.01
Stunting (HAZ<-2SD) (1/0)	0.39	0.40	-0.02	0.34	0.36	-0.03
Weight for age (WAZ)	-1.97	-1.99	0.02	-1.88	-1.89	0.02
Underweight (WAZ<-2SD) (1/0)	0.50	0.49	0.01	0.46	0.47	-0.01
Observations	*3620*	*2098*		*5103*	*5707*	
Panel B: 19 years +						
Body mass index (absolute value)	18.26	18.40	-0.06	18.88	18.91	-0.01
Moderate thinness (BMI<18.5)	0.60	0.56	0.07	0.49	0.48	0.01
Severe thinness (BMI<17)	0.29	0.28	0.03	0.20	0.20	0.02
Observations	*6,415*	*4,027*		*8,459*	*9,638*	

Notes: Table shows baseline (2007) means of outcome variables. Columns 1 and 2 show means across treated and control areas for ultra-poor households. Columns 4 and 5 show outcome means across treated and control areas among other-poor households. Columns 4 and 6 present normalized differences between the respective groups, calculated as the difference in means in treatment and control areas, divided by the squared root of the sum of their variances.

Nutritional status indicators for children below 5 are graphically represented in Figure 5.1 (see Annex 5.1 for details). At baseline approximately a fifth all children are wasted, nearly half are stunted and underweight across the treated and control areas for UP and OP households. Similarly, continuous z-scores indicating malnutrition (weight-for-height, height-for-age and weight-for-age) are considerably below the WHO reference median across all groups.

5.3.4 Empirical strategy

5.4.1 Analytical technique

To identify impact of the programme on the ultra-poor, we compare trends in nutritional outcomes of ultra-poor individuals between treated and control communities. We estimate a difference-in-difference (DiD) model for each outcome Y_i to control for group-level compositional changes across treated and control areas. Using ordinary least squares for the sample of UP households, we calculate the DiD using the following functional form:

$$Y_{it} = \alpha + X'_{i0}\beta_1 + Y'_{i0}\beta_2 + \beta_3 D_{it} + \gamma_i + t_t + \varepsilon_{it} \quad (1)$$

X'_0 represents a vector of baseline household characteristics and Y'_0 represents baseline outcomes (Y'_0). Given the broad scope of CFPR, we prefer to control for baseline, rather than time varying characteristics as these could potentially be affected by the treatment. γ_i represents village level fixed effects[69] and t_t represents the time trend in nutritional status common to both groups. D_{it} is equal to one if the household is residing in a treated district at time t. The coefficient of interest (β_3) represents the treatment effect of the CFPR. Spill-over effects are identified using the same specification (1), but estimated on the sample of OP individuals. Standard errors are clustered at the branch level.

The women-centric application of the CFPR resulted in greater socioeconomic gains for female headed households during the first phase of the programme (Misha et al., 2014). On the other hand, gender based discrimination in favour of males, especially in terms of food consumption and in relation to children, are not uncommon in Bangladesh (WFP, 2012). To investigate the gender related heterogeneity of the effects of CFPR on nutritional outcomes, we extend model (1) through the inclusion of two interaction terms:

$$Y_i = \alpha + X'_{i0}\,\theta_1 + Y'_{i0}\,\theta_2 + \theta_3 D_{it} + \theta_4 D_{it} * HH_{it} + \theta_5 D_{it} * Gen_{it} + \gamma_t + \varepsilon_{it} \quad (2)$$

where $HH_{it} = 1$ if the head of the household is male. Similarly, $Gen_{it} = 1$ if the individual is a male. In model (2), θ_3 gives the unique average effect of CFPR on a female respondent in a female headed households. The average effect on the treated is obtained though averaging the partial effect of CFPR across treated areas and subsequently combining θ_3 with θ_4 and θ_5. Similarly, the impact on individuals in female headed households (θ_4) is given by averaging the partial effect of CFPR in treated areas for the particular subgroup. Standard errors are estimated using the delta method and are clustered at the branch level.

To deal with Type 1 errors (α) due to multiple hypothesis testing, the critical value at which the null hypothesis is rejected are adjusted downward using the Bonferroni correction procedure (Gibson et al., 2011; Sankoh et al., 1997)[70] All analysis is done using STATA 13.

[69] We prefer using village fixed effects over individual fixed effects as the latter cannot be identified for those individuals 'outgrow' a specific age-group, or are born into the youngest group later on in the survey. We confirmed robustness of results to using household fixed effects, and to using non-linear models. Results are available upon request.

[70] Tables 5.2, 5.3 and 5.4 examine the impact and spillover effects of CFPR on multiple outcomes, giving rise to the possibility of Type I errors (α). Typical thresholds of α=0.05 equates to 1 in 20 null hypothesis being rejected by chance. The probability increases to 0.27 for 6 outcomes. We use Bonferroni correction procedures for multiple hypothesis testing following Gibson, McKenzie and Stillman (2011). The correction accounts for family-wise correlations between outcomes. For outcomes related to ages 0 to 19 years, the correlation m is 0.13 and 0.23 for adult (19+ years) outcomes. Although the Bonferroni procedure is considered quite conservative for correlated outcomes, our results are robust to the correction (McKenzie 2012; Perneger 1998). Factoring in family-wise correlations in the calculations yields the following set of critical values:

Critical threshold (α)	Bonferroni corrected critical threshold (αB)	
	0-19yrs	19+ years
0.100	0.021	0.046
0.050	0.011	0.023
0.010	0.002	0.005

5.4.2 Attrition

The rate of attrition in our sample (16% and 17% for participant and non-participant household members respectively) is not uncommon for programmes such as the CFPR (Banerjee et al., 2010). Models investigating the correlates of attrition among both UP and OP households are presented in Annex 5.5. Generally we find limited correlation among the covariates with the likelihood of attrition. Household heads working in agriculture or as semi-skilled workers among UP households are less likely to attrite. Household heads with primary education among OP households are similarly less likely to attrite. We subsequently test whether the relationship between the covariates and attrition vary across the treatment status. The null hypotheses of this test was not rejected. Attrition could bias our impact estimates if it is related to unobservable time varying variables that also correlate with treatment. To test for attrition bias we utilize the Verbeek and Neijman (1992) test where we add a leading selection indicator to the DiD model (1) and test the significance of this indicator (Jones et al., 2013). Results indicate the attrition to be random as the null of no effect was not rejected for any of the outcomes (results available upon request).

5.5 Results

5.5.1 Impact of CFPR on participant households

Table 5.3 presents the average treatment effect on UP households. The estimates are subsequently disaggregated to show the heterogeneity of impact across the sex of the household head and subsequently across the gender of each of the members. Panel A presents the impact of the CFPR on under-5 children. The weight-for-height z-scores in children increase by 0.78 SD and represents nearly 60% change over the baseline mean. This correspondingly precipitates the reduction in the probability of wasting (WHZ<-2SD) by 8 percentage points (pp). Children in treated areas experience an increase of 0.52 SD in the weight-for-age indicator (25% increase from baseline) with a corresponding reduction in the likelihood of being underweight (WHZ<-2SD) by 19pp. No impact is seen in the height-for-age indicator or the probability of stunting. Results investigating the heterogeneity of impact show greater reduction in the probability of being underweight in female headed households. The impact of CFPR does not vary by the sex of the individual.

Panel B presents impact of CFPR on the nutritional status of individuals aged 6 to 19 years. The BMI among individuals in this age group increase by 0.36 SD (27% over the baseline) with an 11pp reduction in the likelihood of being thin. Though the weight-for-age does not increase significantly, the probability of being underweight (WAZ<-2SD) reduces by 10pp. Height-for-age or the likelihood of stunting (HAZ<-2SD) are not affected by CFPR participation. Heterogeneity of effects confirm that individuals in female headed households experience a greater reduction in the probability of thinness.

Impact on individuals aged above 19 years are presented in Panel C. Results show that the BMI among adults in treated communities increases by 0.57. The probability of being moderately thin (BMI<18.5) reduces by 11pp and the likelihood of being severely thin (BMI<17.0) by 8pp. Heterogeneity in impact reveal greater gains in BMI among men. Similarly, adults living in male headed households are more likely to experience larger reduction in the probability of moderate thinness. We subsequently test

Table 5.3: Impact of CFPR on nutritional status of ultra-poor households

	Heterogeneity of impact									
	Main impact		**Male headed households**		**Female headed households**		**Female**		**Male**	
	Marginal Effects	**Standard errors**	**Marginal Effects**	**Standard errors**	**Marginal Effects**	**Standard errors**	**Marginal Effects**	**Standard errors**	**Marginal Effects**	**Standard errors**
Panel A: 0 to 5 years										
Weight for height (WHZ)	0.781***	0.112	0.764***	0.123	0.894***	0.242	0.703***	0.119	0.856***	0.144
Wasting (WHZ<-2SD) (1/0)	-0.079*	0.041	-0.074	0.043	-0.107	0.070	-0.066	0.047	-0.090*	0.043
Height for age (HAZ)	0.096	0.180	0.067	0.180	0.291	0.320	**-0.059**	0.187	**0.247**	0.194
Stunting (HAZ<-2SD) (1/0)	-0.049	0.064	**-0.029**	0.065	**-0.186**	0.090	-0.044	0.066	-0.053	0.071
Weight for age (WAZ)	0.520***	0.107	**0.487*** **	0.110	**0.742*** **	0.162	0.431***	0.120	0.607***	0.119
Underweight (WAZ<-2SD) (1/0)	-0.191***	0.039	-0.204***	0.041	-0.099	0.076	-0.162***	0.044	-0.219***	0.046
Observations	*3,420*		*2,975*		*443*		*1,689*		*1,729*	
Panel B: 6 to 19 years										
Body mass index (BMI in SD)	0.362***	0.054	0.342***	0.056	0.429***	0.072	0.396***	0.059	0.333***	0.062
Thinness (BMI< -2SD) (1/0)	-0.114***	0.022	**-0.098*** **	0.022	**-0.169*** **	0.030	-0.115***	0.023	-0.114***	0.026
Height for age (HAZ)	0.009	0.091	-0.015	0.097	0.093	0.103	**-0.065**	0.106	**0.074**	0.086
Stunting (HAZ<-2SD) (1/0)	-0.018	0.027	-0.018	0.029	-0.019	0.036	0.005	0.036	-0.038	0.026
Weight for age (WAZ)	0.176	0.097	0.139	0.100	0.307	0.160	0.220	0.113	0.140	0.105
Underweight (WAZ<-2SD) (1/0)	-0.104***	0.038	-0.104*	0.041	-0.105	0.064	-0.138***	0.039	-0.076	0.048
Observations	*4,946*		*3,824*		*1,122*		*2,295*		*2,651*	

Table 5.3: *(Continued)*

	Heterogeneity of impact									
	Main impact		Male headed households		Female headed households		Female		Male	
	Marginal Effects	Standard errors	Marginal Effects	Standard errors	Marginal Effects	Standard errors	Marginal Effects	Standard errors	Marginal Effects	Standard errors
Panel C: 19 years +										
Body mass index (absolute value)	0.566***	0.077	0.585***	0.083	0.529***	0.092	**0.608*** **	0.077	**0.442*** **	0.090
Moderate thinness (BMI<18.5)	-0.109***	0.014	**-0.119*** **	0.015	**-0.091*** **	0.015	-0.110***	0.013	-0.106***	0.020
Severe thinness (BMI<17)	-0.076***	0.012	-0.071***	0.011	-0.085***	0.016	-0.080***	0.011	-0.064***	0.019
Observations	*17,895*		*11,840*		*6,055*		*13,420*		*4,475*	

Notes: Table shows marginal effects of OLS models using village level fixed effects. For ages 0 through 19, effect on the continuous z-scores should be interpreted in terms of standard deviations from the median of the WHO international reference group. Results for the group 20+ years show absolute values of BMI and binary outcomes (BMI<18.5 and BMI<17.5) indicating moderate and severe thinness. Errors are calculated using the delta method and clustered at the branch level. Critical values at which the null hypothesis is rejected is adjusted down using the Bonferroni correction. *, **, *** indicate significance at the 10%, 5% and 1% respectively. Bold indicates significant difference between male and female headed households; and between male and female respondents at the 10% level.

whether women are impacted differently across male or female headed households. Results reveal no significant differences (results available upon request).

Overall, considerable effects are seen for individuals living in participating households, the results most pronounced among the children under-5.

5.5.2 Spill-over effects of CFPR

The spill over of effects of CFPR on OP households are presented in Table 5.4. The weight-for-height z-scores for children under-5 increase by 0.45 SD, resulting in a 12pp drop in the probability of being wasted. While the magnitude of impact on the continuous indicator is nearly half in comparison to the impact on the ultra-poor, the magnitude of the effect on the variable indicating wasting is in fact larger than the ATET (12pp versus 8pp). The weight-for-height indicators increases by 0.28 SD (compared to 0.52SD for the UP). This results in the reduction in probability of being underweight by 9pp in comparison to 19pp among the UP. Impact on height-for-age or the probability of stunting is not significantly different from 0. Heterogeneity of effects across the sex of the household head show the effects on the weight-for-height indicator to be more than four times greater among the female headed households. Similar results are found for the probability of wasting. Furthermore, the z-score for weight-for-height among female children increase nearly twice as much. Similar trends are also noticed for the weight-for-age indicator.

Effects are smaller for the 6-19 years age group (Panel B). The z-score for BMI increases for this population by 0.19 SD and the probability of being thin reduces by 4pp. The magnitudes of these effects are nearly half of the impact for the UP (0.36 SD and 11pp respectively). No impact is seen for the height-for-age or the weight-for-age indicators. While no heterogeneity is detected across the sex of the household head, gains in BMI among female members are significantly higher.

Panel C shows the impact on adults older than 19 years. The BMI among adults increase by 0.23 (roughly a third of the impact on UP households). The correspondent likelihood of being moderately thin (BMI<18.5) reduces by 4pp and the probability of severe thinness diminishes by 3pp (corresponding figures for participant adults are 11pp and 8pp respectively). While no heterogeneity of effects are apparent across the sex of the household head, the BMI among the female members are three times their male counterparts. The likelihood of severe thinness decreases considerably more for the women. No impact of CFPR is seen among members of NP households (see Annex 5.6). Overall, significant improvements are seen in the nutritional status among the OP, the size of the magnitudes being typically half of those for the participants.

5.5.3 Pathways of spill over effect in non-participant children

We use the UNICEF nutrition framework (1990)including blindness. The triple A approach includes: 1 to identify potential avenues for spill-over effects. The framework identifies factors such as the increased likelihood and duration of exclusive breastfeeding, diminished exposure to infectious diseases and access to vitamin A supplements as contributing to better nutritional outcomes among children. At baseline, proportion of mothers who breastfeed are nearly universal (see Annex 5.2). Among the UP, more than 95% of the mothers in treated areas breastfeed their children compared to 97% in control. The duration of exclusive breastfeeding among the UP in treated and control areas are 103 days and

Table 5.4: Spillover effects of CFPR on nutritional status on other-poor households

	Heterogeneity of impact									
	Main impact		Male headed households		Female headed households		Female		Male	
	Marginal effects	Standard errors	Marginal effects	Standard errors	Marginal effects	Standard errors	Marginal effects	Standard errors	Marginal effects	Standard errors
Panel A: 0 to 5 years										
Weight for height (WHZ)	0.452***	0.111	**0.421*** **	0.107	**1.321*** **	0.306	**0.561*** **	0.128	**0.341** **	0.121
Wasting (WHZ<-2SD) (1/0)	-0.119***	0.032	**-0.108*** **	0.032	**-0.428*** **	0.140	-0.140***	0.037	-0.097**	0.037
Height for age (HAZ)	0.057	0.127	0.077	0.124	-0.524	0.410	0.128	0.148	-0.016	0.148
Stunting (HAZ<-2SD) (1/0)	-0.019	0.043	-0.021	0.041	0.019	0.186	-0.051	0.062	0.012	0.040
Weight for age (WAZ)	0.282***	0.058	0.273***	0.059	0.524	0.269	**0.353*** **	0.064	**0.210*** **	0.065
Underweight (WAZ<-2SD) (1/0)	-0.086***	0.029	-0.089***	0.028	-0.012	0.175	-0.030	0.032	-0.142***	0.035
Observations	*6,583*		*6,355*		*228*		*3,263*		*3,320*	
Panel B: 6 to 19 years										
Body mass index (BMI in SD)	0.189***	0.050	0.182***	0.050	0.295***	0.097	**0.241*** **	0.059	**0.141**	0.057
Thinness (BMI< -2SD) (1/0)	-0.042*	0.018	-0.043*	0.018	-0.041	0.040	-0.031	0.021	-0.053*	0.022
Height for age (HAZ)	-0.022	0.075	-0.021	0.077	-0.044	0.135	-0.051	0.072	0.004	0.095
Stunting (HAZ<-2SD) (1/0)	0.021	0.025	0.023	0.024	-0.001	0.050	0.011	0.029	0.031	0.028
Weight for age (WAZ)	0.045	0.089	0.035	0.091	0.205	0.166	0.031	0.076	0.058	0.119
Underweight (WAZ<-2SD) (1/0)	-0.017	0.042	-0.021	0.042	0.037	0.094	-0.005	0.035	-0.029	0.057
Observations	*8,957*		*8,396*		*561*		*4,333*		*4,624*	

Table 5.4: *(Continued)*

	Main impact		Heterogeneity of impact							
			Male headed households		Female headed households		Female		Male	
	Marginal effects	Standard errors	Marginal effects	Standard errors	Marginal effects	Standard errors	Marginal effects	Standard errors	Marginal effects	Standard errors
Panel C: 19 years +										
Body mass index (absolute value)	0.227***	0.066	0.234***	0.068	0.179	0.089	**0.297*** **	0.067	**0.082**	0.081
Moderate thinness (BMI<18.5)	-0.036***	0.012	-0.038***	0.012	-0.026	0.016	-0.037***	0.012	-0.035	0.017
Severe thinness (BMI<17)	-0.025***	0.007	-0.025***	0.007	-0.027	0.015	**-0.029*** **	0.007	**-0.018***	0.008
Observations	*30,803*		*26,900*		*3,903*		*20,691*		*10,112*	

Notes: Table shows marginal effects of OLS models using village level fixed effects. For ages 0 through 19, effect on the continuous z-scores should be interpreted in terms of standard deviations from the median of the WHO international reference group. Results for the group 20+ years show absolute values of BMI and binary outcomes (BMI<18.5 and BMI<17.5) indicating moderate and severe thinness. Errors are calculated using the delta method and clustered at the branch level. Critical values at which the null hypothesis is rejected is adjusted down using the Bonferroni correction. *, **, *** indicate significance at the 10%, 5% and 1% respectively. Bold indicates significant difference between male and female headed households; and between male and female respondents at the 10% level.

94 days respectively. While 28% of the mothers administered vitamin A to their children after birth in treated areas, the proportion among the control are 34%. The prevalence of breastfeeding and the duration are comparable in OP households, the proportions of children who receive vitamin A are 38% and 34% in the treated and control areas respectively. Lastly, the prevalence of children under-5 with infectious diseases is 3% for both UP and OP households in both treated and control areas.

The framework similarly identifies illnesses, lack of food security and poor public health conditions (e.g. access to sanitary latrines) as detrimental to adult nutritional status. At baseline, the likelihood of an illness averages at around 27% and 26% among the UP and OP respectively. While 47% of UP in treated areas can typically manage 2 meals a day, their counterparts average at 36%. Approximately 66% of OP in treated areas can manage two meals day, the average among those in the control areas are 57%. Nearly 55% of households in treated areas use sanitary latrines compared to 47% among the control. Use of sanitary latrines among the OP are 65% and 60% respectively for treated and control areas. Access to safe drinking water however is nearly universal across all groups.

Table 5.5 shows the impact of CFPR on intermediary outcomes affecting the nutrition status of members in both UP and OP households. Considering the high prevalence of breastfeeding during the baseline, the lack of impact is not surprising. The impact on the duration of exclusive breastfeeding is large. CFPR causes mothers in ultra-poor households to increase the duration of exclusive breastfeeding by 73 days (75% increase over the baseline), while the spill over effect to other-poor is 52 days (49% increase over the baseline). Similarly, the probability of a child receiving a vitamin A supplement increases by 26pp and 20pp among UP and OP households respectively.

If the duration of breastfeeding is an important pathway of the nutritional impact of CFPR, we should see larger effects of CFPR on children under 24 months. We investigate the heterogeneity of impact across two age groups: 0-24 months years and 25-60 months (see Annex 5.7) and find that indeed underweight weight-for-height and probability of being underweight are more strongly affected for the younger group (0-24 months) among both the UP and OP households. The differences in the magnitudes of impact for the ultra-poor and other-poor households are comparable to the main findings.

Adults among ultra-poor households are less likely to fall ill by 2pp, though no impact is seen among the other-poor adults. In terms of food security however, both groups experience an increase in the probability of generally being able to secure at least two meals every day (by 14pp and 6pp for the ultra-poor and other-poor respectively). Lastly, the use of sanitary toilets increase by 18pp and 11pp respectively for the ultra-poor and other-poor respectively.

Table 5.5: Impact on intermediary outcomes

	Ultra-poor households		Other-poor households	
	Marginal effects	**Standard error**	**Marginal effects**	**Standard error**
Breastfeeding and vitamin A supplements				
Probability of breastfeeding (1/0)	0.012	0.013	0.018	0.011
Duration of exclusive breastfeeding (days)	72.681***	0.025	59.521***	0.080
Administration of Vitamin A (1/0)	0.264***	0.069	0.196**	0.080
Observations	*2,300*		*4,894*	
Illnesses				
Likelihood of contracting an infectious disease (children) (1/0)	-0.052	0.048	-0.005	0.030
Observations	*1,363*		*2,714*	
Likelihood of falling ill (adults) (1/0)	-0.020*	0.006	-0.006	0.004
Observations	21,841		36,760	
Food security				
Members can generally manage two meals a day (1/0)	0.143**	0.059	0.061*	0.030
Observations	*4,296*		*8,896*	
Safe water and hygiene practices				
Use of sanitary toilet (1/0)	0.179***	0.055	0.108**	0.049
Safe drinking water (1/0)	-0.005	0.008	-0.011	0.008
Observations	*4,296*		*8,896*	

Notes: Table shows marginal effects of OLS models using village level fixed effects. Results represent the impact of CFPR on intermediary outcomes that may affect nutritional status in ultra-poor and other-poor households and the sample is restricted to households with children under 5. Standard errors clustered at the branch level. *, **, *** indicate significance at the 10%, 5% and 1% respectively.

5.5 Discussion and concluding remarks

Challenging the Frontiers of Poverty Reduction (CFPR) was implemented by a NGO called BRAC with the target of alleviating ultra-poverty in Bangladesh. The CFPR provides income generating and multifaceted training in entrepreneurial activities, health, and nutrition, social and legal awareness to its participants over a period of two years. Utilizing the randomized rollout of the programme, this paper uses a two round panel data across four years to first identify the impact of CFPR on the nutritional status among the ultra-poor (UP) participant households. Second, we estimate the spill-over effects of the programme on other-poor (OP) and non-poor (NP) households. Heterogeneity of impact is measured across male and female headed households followed by the sex of the respondent. Lastly, through the measurement of intermediary outcomes that affect the nutritional status, we analyse pathways through which the impact and spill-over effects take place.

We find considerable impact on the nutritional status among UP household members, most pronounced for children under-5. In addition to improvements in the weight-for-height and weight-for-age indicators, the likelihood of wasting and being underweight reduces by 8pp and 19pp respectively. Among 6-19 years age group, the likelihood of thinness drops by 4pp, followed by a 10pp reduction in the probability of being underweight. While gains are generally higher among individuals in female headed households, we find no differences in impact across gender of the specific individual. Nutritional status among adults in ultra-poor households similarly gain from CFPR, leading to decreases in the likelihood of moderate and severe thinness (by 11pp and 8pp respectively).

We find that the CFPR generates spill-over effects among non-participating households in treatment areas, the benefits however restricted to other-poor households as opposed to the non-poor. The magnitudes of the impacts on OP are generally half of the UP households and are typically most pronounced for children. We find that the likelihood of wasting or being underweight reduce by 12pp and 9pp respectively for children in this group. The probability of thinness reduces by 4pp among the 6-19 year olds. In line with findings from the ultra-poor, individuals in female headed households gain the most. While the gains in nutritional status among children under-5 are more favourable towards females, males aged 6-19 years fare better. Other-poor adults (19+ years) on average experience a 4pp and 3pp drop in the likelihood of being moderately and severely thin.

Analysis of the pathways provides important insights. Results indicate that increased durations of exclusive breastfeeding and vitamin A supplements among both the ultra-poor and other-poor. For adolescents and adults in ultra-poor households, several factors contribute to the improved nutritional status. In addition to the rise in income as noted by Bandiera et al (2013), we find evidence of improved food security, lower likelihood of falling ill and improved hygiene practices. For the other-poor, results show improved food security and improved hygiene practices. While the rise in income for this group as small in magnitude (Bandiera et al., 2013), Angelucci et al (2006), studying the spill-over effects of a cash-transfer programme (PROGRESA) on the nutritional status of non-participants, offer an alternative explanation as to how this takes place. They state that despite the nominal rise in income among non-participants, the consumption among these households increase considerably more. Due to the liquidity injection among the participants, the non-participants receive more transfers and can borrow more when hit by a negative shocks, thereby reducing their precautionary savings to increase current consumption.

There are some limitations to this study. Given the lack of birth registration practices, especially among lower socioeconomic groups, we use approximate ages (in nearest months) when calculating the z-scores used in the models. Pathways of impact and spill-over effects measured in this paper are not comprehensive. There may be other unaccounted ways through which these effects occur and merit further research. Notwithstanding these limitations, several important points emerge from our analysis. We find that the CFPR not only has considerable impact on the nutritional status of its participants, but also creates positive spill-over effects among non-participants. The magnitude of impact on the non-participants in treated areas is typically half of the impact on participants. In line with previous literature showing that women in charge of allocating productive and financial assets of a family are likely to garner greater positive change, we find individuals in female headed households fare better (Baden and Milward, 1995). The fact that there is limited indication of gender differentials in impact in an important

finding. Gender based discrimination biased towards males, especially for children is not uncommon in Bangladesh (WFP, 2012). The results may be indicative of the success of a large number social awareness programmes, including CFPR, working to reverse these trends (Kabeer et al., 2013). Lastly, the impact and spill-over effects, especially among infants (through increased durations of exclusive breastfeeding), are driven by behavioural changes, without financial incentives. This shows that unlike other nutrition oriented programmes that typically adopt a one-off push[71], repeated exposure to CFPR over a two year period is likely to have played a key role in instilling the messages among the participants, ultimately leading to behavioural changes. Similar exposure and longer periods of "demonstration effects" play a large role in precipitating similar changes among the other-poor households in the treated communities.

Overall, in spite of accounting for actual impact and spill-over effects, longer term impact of CFPR may be underestimated, especially for children. In the short run, resources typically dedicated to dealing with illnesses brought on by increased vulnerabilities will likely be allocated to more fruitful avenues. Increased cognitive acumen through improved nutrition will increase performance in productive activities. Longer term impact as adults will likely lead to higher professional productivity and financial gains.

[71] The Gates Foundation funded programme Alive and Thrive for example aims to improve infant and child feeding practices in Bangladesh through increasing the rates of exclusive breastfeeding and complementary feeding practices. Evaluation of the large scale programme reported that while the programme was able to induce earlier breastfeeding practices, the duration of exclusive feeding remained unaffected (Saha KK, Bamezai A, Khaled A, Subandoro A, Rawat R 2008). A number of studies on the other hand report the absence or even negative effects of food subsidy programmes on nutrition (Jensen and Miller, 2011, 2008; Shankar Shaw and Telidevara, 2014).

Chapter 6

Can ultra-poverty be sustainably improved? Evidence from BRAC in Bangladesh

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6.1 Introduction

Located in the heart of South Asia, Bangladesh has achieved miracles in terms of poverty alleviation. However, not out of the woods yet, the country still has a long way to go and grounds to cover. Of the 153 million people in Bangladesh, 40 per cent live in poverty using the upper poverty headcount, while 25.1 per cent of the population live below the lower poverty headcount using the same method (BBS, 2007). Lipton (1986) defined ultra-poor as receiving less than 80 per cent of the minimum caloric intake while spending more than 80 per cent of income on food. By that account, close to 20 per cent of the population of Bangladesh live in ultra-poverty.[72] Due to the widespread nature of poverty across the country, there has been a great influx of poverty reduction programmes in Bangladesh.

Bangladesh has a comprehensive portfolio of safety net interventions such as conditional and unconditional cash/food transfers, and sometimes a combination of both in exchange for employment through employment generation programmes. According to Ahmed et al. (2009) there are around 27 such safety-net programmes run by the Government of Bangladesh.[73] However, many of these public interventions often fail to reach the ultra-poor (Hashemi, 2001). As evidence states, people who live far below the poverty line – that is, the ultra-poor – are likely to require a combination of vigorous interventions to cross a certain threshold to emerge from poverty within a generation (Hulme et al., 2001). Braun (1995) states that 'higher casual wages *plus* access to several years of post-primary education *plus* access to meaningful transfers such as pensions and child allowances *plus* land redistribution'. These programmes along with similar food-for-work programmes should not be considered as alternatives but as compliments to other such initiatives (Ahmad et al., 1991).

Another popular alternative to directed employment generation programmes is the microfinance option for the poor. However, despite the fact that microfinance intends to target the poor, in practice it often fails to reach those living in ultra-poverty (Hashemi, 2001; Hulme and Mosley, 1997; Rahman and Razzaque, 2000; Wood and Sharif, 1997). A classical catch-22, a circular constraint binds the extreme poor. On one hand, they cannot access institutional credit because of their insufficient asset base (that is, the lack of credit worthiness); and, on the other, they cannot accumulate assets because of the insufficient capital base. Furthermore, due to their immediate consumption needs, they also tend to save less, thereby increasing their vulnerabilities to shocks and disasters.

Income Generation for Vulnerable Group Development is another safety-net programme that was implemented in Bangladesh by BRAC during the 1990s for the ultra-poor who were not able to participate in mainstream microfinance.[74] The programme aimed at transferring staple food items such as wheat. However, it was realised that the Income Generation for Vulnerable Group Development programme was inadequate for reaching certain groups of the poor, especially those suffering from ultra-poverty (Hashemi, 2001; Matin and Hulme, 2003; Webb et al., 2002).

[72] According to BBS (2007), approximately 19.50 per cent of Bangladesh's population lives on under 1805 kcal per day.

[73] According to World Bank (2006), poverty eradication in Bangladesh only through investment in social assistance would require about 35 per cent of public expenditure. However, the actual rate of investment in social protection in 2004 was only about 5 per cent of public expenditure.

[74] BRAC, formerly known as Bangladesh Rural Advancement Committee, is one of the largest non-governmental organisations in the world.

In light of its learning from Income Generation for Vulnerable Group Development and over three decades of past field-level experience, BRAC addressed this issue through an innovative programme called Challenging the Frontiers of Poverty Reduction (CFPR). Programmatic details such as the exclusion and inclusion criteria, typical costs per beneficiary of operating such programmes, background services, and so forth, are provided in Annex 6.1. Numerous studies have reported various positive impacts of CFPR on the participants (Ahmed et al., 2009). But these studies showed only short-run impact of the programme. Krishna et al. (2012) showed longer-term impact of the programme but this study has some methodological limitations. Despite the non-randomised evaluation design of the programme and in many instances the comparison group being better off than the intervention group at baseline, their study used the difference-in-difference technique for assessing programme impacts.

In this paper, we analyse the core impacts of CFPR on the lives and the livelihoods of its participants in both the short run and the long.[75] It must be mentioned here that in terms of the short run we refer to the period 2002-2005; and for the long or longer run, we refer to the period 2002–2008. In this study we mainly assess the livelihood impacts in terms of income, assets and food security of the participant households. Using panel data and propensity score matching, this study shows that impact on the per-capita income, asset and food security is substantial and has sustained over the longer term. As mentioned in Annex 6.1, after two years of the programme cycle the participant households are eligible for BRAC microfinance. As we shall mention in the following section, for the impact assessment we use sample households who received programme support in 2002 (that is, completed the programme cycle at the end of 2003) and we use three rounds of survey data (2002-2005-2008). This implies that our assessments would capture both the effect of the grant-based support packages as well as their subsequent participation in BRAC microfinance. It also needs to be mentioned here that while participating in microfinance is an added benefit to the participants if they choose to do so after the completion of the programme, it is not mandatory. Shams et al. (2011) showed that by the 2005 mark, 49 per cent of our sample households (that is, those who were provided support in 2002 and completed the cycle at the end of 2003) participated in BRAC microfinance, although the proportion increased to some extent by 2008.

The paper is structured as follows: Section 2 provides a detailed description of the data and the methodology used for the paper, Section 3 provides the results and discussion, and Section 4 concludes.

6.2 Methods

6.2.1 Data

The CFPR programme was launched in 2002 in the three poorest districts (Rangpur, Kurigram and Nilphamari) of Bangladesh. As part of the evaluation of the programme, a baseline survey was carried out during June-August 2002 in these three districts. As mentioned in Annex 6.1, the participant households were selected through a participatory wealth-ranking process. Usually households in the

[75] A recent study (Das and Misha, 2010) looked into the sustainability of livelihood impacts of the CFPR. However, there is methodological limitation; a simple difference-in-difference technique was used despite the comparison being better off than the treatment group in many socio-economic aspects.

poorest category of wealth rankings were considered the 'ultra-poor', although sometimes households in the poorest two categories were also considered. Among the ultra-poor, the group of households that meet the selection criteria received programme supports. These beneficiaries were called 'selected ultra-poor' (SUP) and the rest of the ultra-poor were called 'not selected ultra-poor' (NSUP). The baseline survey represented both the SUP and NSUP households. The NSUP households were surveyed to construct the comparison group for impact assessment. For the rest of the paper, SUP and NSUP households are used interchangeably with treatment and comparison households.

The sample size for baseline survey was 5626 households, of which 2633 were SUP and 2993 were NSUP households. This was followed by a second-round survey in 2005. In the 2005 follow-up survey, 2474 SUP and 2754 NSUP households were successfully re-surveyed. The third-round survey was conducted in 2008 where a total of 4549 households were successfully re-visited, and among them 2251 were SUP and 2298 were NSUP households. The attrition rate was thus 7 per cent during 2002-2005 and 19 per cent during 2002-2008. The present study is based mainly on 2002, 2005, and 2008 panel data consisting of 2251 SUP and 2298 NSUP households. To verify whether the households surveyed in the baseline suffering from attrition contained any inherent biases (that is, non-random attrition) that could potentially skew the results in one way or another, we have analysed the baseline data for those who were not available for re-interviewing during the follow-up surveys against those who were (Annex 6.2). Results from Annex 6.2 give us a strong indication that most of the variables tested were not statistically different within the groups. As for those variables that were found to be statistically different from each other, the magnitude of difference was found to be quite small, thereby giving indication that our impact estimates are likely to be free from potential biases due to attrition.

For food expenditure and calorie intake analysis, we have used a subsample from the above-mentioned baseline survey. From the full baseline representation, a subsample of 400 households (200 SUP and 200 NSUP households) was selected for collecting data on food consumption. These households were surveyed in 2002, 2004, and 2006. In the 2006 survey, 160 SUP and 138 NSUP households were successfully re-visited. Therefore, food expenditure was analysed using a panel of 160 SUP and 138 NSUP households. The food expenditure data was collected using a three-day recall method. The surveys were conducted by the Research and Evaluation Division of BRAC. The survey questionnaire was administered to the main female member of the household.

6.2.2 Analytical technique

As mentioned earlier, the comparison group for impact assessment of the CFPR constituted those households who were identified as ultra-poor during the community wealth-ranking exercise, but failed to pass the final selection process. Expectedly, the NSUP households were different from the SUP households in terms of various socio-economic characteristics and in many instances were better off than their SUP counterparts (Annex 6.3). For example, per-capita income of the SUP was BDT 2493 (US$35.74), while for NSUP it was BDT 2785 (US$39.93).[76] For any impact assessment, we need to consider the counterfactuals of what would have happened to the intervened households if the intervention did not take place. As such, we would require constructing a comparison group that is similar to the treatment group. However, the NSUP households are unlikely to control for such counterfactuals as they are better

[76] Conversion rates from USD to BDT.

off than the treatment group. This implies that use of a simplified difference-in-difference technique to investigate the efficacy of the CFPR may not be appropriate. The strong evidence base suggests that when it comes to nonrandomised datasets, traditional difference-in-difference methodologies do not necessarily address the potential systematic differences that may be inherent within the dataset (Rubin, 1997; Trojano et al., 2009; Yanovitzky et al., 2005). An alternative method is the propensity score matching technique that constructs a comparative comparison group who are likely to be similar to the treated, contingent on their participation probability densities.

6.2.3 Propensity score matching

Under the propensity score matching method, a control or comparison group is constructed based on observable characteristics by 'matching' the treatment households with comparison households. Our use of propensity score matching to assess the impacts of the CFPR programme involves a number of steps. First, using a probit model, the propensity scores for participation in the programme were estimated. Second, we tested the balancing properties of the data by testing that treatment and comparison groups had the same distribution (mean) of propensity scores and of control variables within groupings (roughly quintiles) of the propensity score. Control variables not satisfying this test were subsequently dropped or replaced with alternative variables and the specification was rechecked.

Third, according to Heckman et al. (1998, 1997), the quality of the match can be improved by ensuring that matches are formed only where the propensity score densities have 'common support', or where the distribution of the density of the propensity scores overlap between treatment and comparison groups. However, the common support can be improved by dropping treatment observations with propensity score 'greater than the maximum' or 'less than the minimum' of the comparison group propensity scores. Similarly, comparison group observations with a propensity score 'below the minimum' or 'above the maximum' of the treatment observations can be dropped.[77]

One limitation of this approach is that treatment observations near these cut-off points face a potential comparison group with propensity scores that are either all lower or all higher than that of the treatment observation (Heckman et al., 1997). To account for this problem, we modify this 'min/max' approach to identifying a region of common support following Ahmed et al. (2009). A probit model is first estimated for programme participation and then we identify the lower and upper cut-off points of common support in the comparison or treatment groups. Subsequently some of the primarily comparison observations were dropped from the left of the distribution while treatment observations were dropped mainly from the right. Then we added back the 5 per cent of observations from each tail that had been dropped that were closest in terms of propensity score.

Furthermore, we trimmed the treatment observations from the interior of the propensity score distribution that had the lowest density of comparison groups (that is, lowest common support) to improve the quality of the match, where we have dropped 2 per cent of the treatment observations. On this common support sample, the probit model was then re-estimated to obtain a new set of propensity scores to be used in creating the match.

[77] The distribution of propensity scores for the comparison group often lies to the left of the distribution for the treatment group for targeted programmes, such as the CFPR programme. As a result, the highest propensity scores tend to come from treatment observations, while the lowest are dominated by comparison observations. Such a pattern indicates effective targeting.

We then match the treatment and comparison observations through local linear matching with a tricube kernel using Stata's PSMATCH2 command (Leuven and Sianesi, 2015). Heckman et al. (1997) and Smith and Todd (2005) argue in favour of local linear matching over other matching techniques. Local linear matching performs well in samples with low densities of the propensity score in the interior of the propensity score distribution. Standard errors of the impact estimates are estimated by bootstrap using 100 replications for each estimate.

We estimated two probit models for matching the households. The first model uses the full sample (pertains to the majority of the analysis; that is, the livelihood factors) while the second uses the subsample (pertains to the food security and calorie intakes). To match the households we included a wide range of variables that include household's physical, financial and human assets, demographic characteristics of the household head and main female (that is, respondent) of the households. These variables also include the specific indicators used to select the ultra-poor households, except one indicator – school-going aged children engaged in paid work, because in some of the surveyed households there were no school-going-aged children. While it may be such that the exclusion and inclusion criteria may alienate the SUP and the NSUP into non-overlapping groups, this may not necessary be the case. This is because, firstly, the matching does not include one of the eligibility criteria of programme participation (that is, children's engagement in paid work). Secondly, eligibility does not always necessarily ensure programme participation.

The reason for this being the case is that although some households were finally selected by the programme, they had refused the support on various social and religious grounds. Our comparison group (that is, NSUP) includes this group of households. Annex 6.4 provides differences of the variables used in the propensity score matching regressions between the participant and non-participant households. It can be seen that non-participant households in some instances are likely to be better off than the participant households. For example, the mean amount of land holding was 6.14 decimal for non-participant households while that of the participant households was 2.4 decimal. Probit regression results for the propensity scores can be seen in Appendices 5.5 and 5.6.

6.3 Results and discussion

6.3.1 Impact on income and assets

The results, as mentioned earlier, encompass the information from the CFPR beneficiaries who had completed the programme intervention at the end of 2003. This means that results for 2002–2005 would show the short-term effects (that is, a year after programme completion) while the results from 2002 to 2008 will show the longer-term impact. Furthermore we also analysed the differences between the short-run and long-run effects to give us an indication of how the transformation of the growth is happening. In essence, the changes in the level of the treatment effect between the time periods of 2002-2005 and 2002-2008, if statistically significant, will tell us that the short-run impact is different from the long-run impact (the direction contingent on its sign). Results from Table 6.1 show that the difference-in-difference in per-capita income between 2005 and 2002 was BDT 794 and BDT 1654 between 2008 and 2002. Both the amounts were found to be highly significant ($p<0.01$ for both). The

level of the change in the treatment effects between the short run and the long run was found to be BDT 860 (significant at 1% level). This iterates that the programme participants have been able to sustain this acceleration in their per-capita income trajectory.

Table 6.1: Double difference PSM results on per capita income and assets

Outcomes	Average Treatment Effect				Changes in treatment effect between 2005 and 2008	
	2005 over 2002	Standard error	2008 over 2002	Standard error	2008 over 2005	Standard error
	(1)		(2)		(3=2-1)	
Per capita real income (2002 price) (BDT)	794***	(89.50)	1654***	(115.56)	860***	(115.50)
Own homestead land (decimal)	0.16	(0.109)	0.49***	(0.148)	0.323**	(0.138)
Own cultivable land (decimal)	-0.137	(0.172)	0.535***	-(0.207)	0.6712***	(0.202)
Mortgaged-in/rented-in land (decimal)	2.048***	(0.407)	3.313****	(0.511)	1.264**	(0.542)
No. of goat/sheep	0.40***	(0.029)	0.41***	(0.034)	0.009	(0.035)
No. of duck/hen	0.52***	(0.110)	2.01***	(0.110)	1.494***	(0.162)
No. of cow/bull	1.60***	(0.029)	1.15***	(0.027)	-0.454	(0.035)
No. of big tree	0.12	(0.110)	0.47***	(0.145)	0.359***	(0.119)
No. of radio	0.01*	(0.005)	0.02***	(0.005)	0.011*	(0.007)
No. of bed	0.131***	(0.026)	0.21***	(0.026)	0.074***	(0.026)
No. of Rickshaw/*van*	0.044***	(0.011)	0.051***	(0.013)	0.007	(0.011)
Market value of the house (BDT)	320***	(90.614)	985***	(206.897)	654.7***	(222.290)
Outstanding credit from formal source (BDT)	806.38***	(51.970)	634.27***	(78.590)	-172.11**	(82.270)
Outstanding credit from informal source (BDT)	-117.86**	(55.240)	-187**	(96.680)	69.14	(94.540)

Note: Figures in the parenthesis are the standard errors. *, **, *** indicate significance at the 10%, 5% and 1% respectively.

Similar results were found for most of the assets we analysed. One thing that must be kept in mind is that some of these assets (particularly the livestock and poultry) were provided to the participants as direct transfers due to programme participation, which may explain the positive treatment effect between 2002 and 2005. However, any effect beyond 2005 could be directly assumed to be a net impact of the CFPR, thereby also shedding a positive light on the sustainability aspect of the programme. Results show that the short-term impacts on the number of livestock and poultry holdings (cow/bull, goat/sheep and chicken/ducks) are positive and significant (p<0.01 for each) during 2002-2005. Longer term impacts

were also found to be positive and statistically significant. More importantly, the treatment effect for ducks/hen has been found to be higher in the long run compared with the short run, indicating that the participant households have managed to multiply these asset holdings since the time they received them from the programme. As for the impact on the number of cow/bulls and goats/sheep in the long run, the level of impact has remained consistent with the shorter run, enumerated by the fact that differences between the treatment effects were not found to be statistically significant. However, this does not necessarily mean that participants had not multiplied these assets after 2005 because it may be such that they actually did and sold those to have cash for household expenditure or even to buy other types of assets.

While livestock and poultry and any produce in general are unique in that they can be used for both family consumption and income generation, assets such as rickshaws/vans are solely income-generating assets. Short-term results of such assets were found to be statistically significant ($p<0.01$). We speculate that the treatment households had been able to generate enough income through CFPR's assistance to be able to purchase a comparatively expensive productive asset such as a rickshaw or a van to diversify their income sources.

One of the background components of the CFPR is that when the programme staff meet on a regular basis with the participant women, time is often dedicated to formulating a viable and secure financial future. This is especially important as the ultra-poor have suffered from such abject poverty until they joined the CFPR that they have been conditioned repeatedly to be helpless when it comes to their own well-being; often they find it difficult to think past immediate needs such as where they may get the next meal. Planting seedling for generating big trees is one such item that the CFPR staff encourage as a means for long-term investment, and often provides seedlings to plant around the homestead to get them started off. A small investment often leads to significant long-term financial gains. Results show that although the difference-in-difference for the number of big trees was statistically insignificant between 2002 and 2005, it was significant ($p<0.01$) during 2002=2008, indicating a positive programmatic effect in the long run.

Analysis of various forms of land holdings has pertinent implications in terms of programmatic effects. Access to cultivable land is paramount in a country like Bangladesh – it is significantly and positively related to poverty in the rural areas of the country. Buying and selling of land is quite limited in Bangladesh and a number of factors (such as remittance inflow) contribute to an ever-inflating price of land in the country.[78] In light of this, treatment households' being able to acquire land can be considered a remarkable achievement of the programme. Results show that in terms of the amount of homestead land owned, although the difference-in-difference was found to be insignificant in the short run, the long-run effect was found to be significant at the 1% level.

Expansion of the amount of homestead land of the treated households signals a steady income stream. Empirical evidence shows that the incremental increase in income leads to purchase of necessary products and services such as food, household repair, children's schooling, and so forth. The purchase of homestead land usually falls later in the requisites, indicating a secure income stream (Krishna, 2007).

[78] One example is remittance inflow, which provides pressure on land prices. Bangladesh received over $9192.16 million in the form of remittances in 2009.

We also analysed the amount of cultivable land holdings and the amount of mortgaged-in/shared-in land. Results, following the trend of the homestead land, show that although treatment effect on the amount of cultivable land was statistically insignificant in the short run, it was positive and statistically significant during the longer run. But the effect on mortgaged-in/rented-in land was found to positive and significant both in the short run and the long run. More importantly, long-run impact was found to be higher than the short-run impact, an indication of sustainability of longer-term impact of the programme.

The ultimate goal of the CFPR programme is to lift its participants out of ultra-poverty so that they may be able to take advantage of the mainstream poverty alleviation schemes such as microfinance. As mentioned earlier, the ultra-poor are often excluded from these activities due to structural constraints from both the demand and supply sides. In an attempt to facilitate this transition to an upper rung in the poverty ladder, programme participants are offered BRAC's microfinance services after two years of programme participation. The idea is that after the two years of participation, the households would have a productive asset base and the confidence and ideas to better use the credit. BRAC's microfinance component designs special loans for the CFRP participants with some flexibilities such as smaller loans and smaller groups with more intense supervision than typical Village Organizations to be able to cater more carefully to the needs of those just coming out of ultra-poverty.[79] These loans allow them to utilise the training on their income generating assets, and confidence they have gained by joining the programme. Analysis of the informal loans (that is, from moneylenders, relatives, friends, shops) shows that the programme had negative impact on this, both in the short and the long run. This is a very encouraging trend given that informal loans are often from local money lenders with very high interest rates. Mallick (2009) showed that the interest rate for a moneylender loan is 103 per cent. As for the formal loans – that is, from various microfinance institutions and banks – the treatment effects were found to be positive, both in the short and the long run, but the effect was found to be gradually reducing. At a glance it may appear that the lower amount of financial market participation is in contrast to the programme objectives. However, evidence suggests that the relationship between the demand for microfinance loans and the working capital (typically personal saving for this case) are in fact quite elastic, meaning that an incremental increase in income or savings will lead to the fall of demand for borrowed money (Salazar et al., 2010)understanding the price elasticity of demand for microcredit is exceptionally relevant in designing appropriate microfinance institution (MFI. As a result, our results may be interpretable as that, given the initial boost in income and savings and its sustained nature in the longer term, the participants will be progressively borrowing less. However, further research should be undertaken to ascertain the veracity of these findings.

Radios and beds are often considered to be luxury items, especially given the context of the ultra-poor in rural Bangladesh. Ownership of such goods suggests that these households have been able to move past the initial vulnerable stages of abject poverty and now are comfortable enough financially (Bandiera et al., 2009). Analysis shows that the difference-in-differences for both the items

[79] Village Organizations are associations of women created by BRAC to strengthen the capacity of the poor for sustainable development and create a link between the rural people and BRAC. There are 220,000 Village Organizations in Bangladesh that reach 6.37 million BRAC members (Barua and Sulaiman, 2006).

were statistically significant over both the short and long run. More importantly, long-run impacts were found to be higher for both items.

6.3.2 Impact on food security

Per-capita calorie intake is one of most popular measures of poverty and vulnerability. In a country like Bangladesh, consumption below 1805 kcal is considered to be hard core poor (BBS, 2007). The baseline information of the participant and non-participant households showed that their per-capita calorie intakes were 1730 kcal and 1818 kcal, respectively. Considering this level of energy consumption, an increase would suggest that the initial degree of vulnerability in terms of food security has been addressed by the programme. Impact estimates show that the participant households increased their energy consumption as a result of programme support, and they were able to sustain the increased consumption for at least two years after their end of programme participation (Table 6.2). Analysing per capita food expenditure we find similar results – impact on per-capita food expenditure in the short run sustained in the long run. One can thus speculate that an increase in energy consumption would help the household members' nutritional status, which would further increase their productivity and thus longer-term gains.

Table 6.2: Double difference PSM results on per capita calorie intake and food expenditure

Outcome variables	Average Treatment Effect				Changes in treatment effect between 2005 and 2008	
	2005 over 2002	Standard error	2008 over 2002	Standard error	2008 over 2005	Standard error
	(1)		(2)		(3=2-1)	
Per capita food expenditure (2002 price) (Tk.)	2.98**	(1.507)	3.55***	(1.132)	0.577	(1.578)
Per capita calorie intake (kcal)	259.6**	(131.20)	356.9**	(152.50)	97.294	(145.80)

Note: Figures in the parenthesis are the standard errors. *, **, *** indicate significance at the 10%, 5% and 1% respectively.

6.4 Conclusion

In an effort to combat extreme poverty in Bangladesh, BRAC initiated the CFPR programme. The ultimate objective of this programme is to improve the lives of its beneficiaries by creating sustainable pathways out of ultra-poverty through a holistic approach. CFPR is a grant-based approach, striving to achieve its objectives through the transference of income-generating assets, thorough training on how to utilise these assets optimally, confidence-building training and the provision of health and social development supports. The core objective of this paper is to assess the longitudinal impacts of the CFPR programme.

More specifically, we looked at the programme's impacts on indicators such as income, assets holdings and vulnerability in terms of food security of the participant households.

Using three rounds of panel data and analysing it using a propensity score matching technique, we found that the difference in per-capita income between the programme participants and comparison groups have been increasing at an accelerating pace, insinuating that the beneficiaries were able to effectively use the training and assets, and outpace their non-participating counterparts in terms of per-capita income. Similarly, we found significant impacts on productive assets such as livestock and poultry holding. This is partly attributable to programme outputs through the grant endowment. But what is impressive to note is that four years on after the end of the programme support, the targeted households were found to possess a substantial productive asset base. It was noticed that other income generating assets such as cultivable land holdings and rickshaws/vans, which were not part of the programme's transfers, also experienced positive impacts. For other assets such as homestead land holdings, which not only provide shelter for the beneficiary families but also income-earning opportunities through vegetable gardening and planting trees, the programmatic effect was found to be positive. Similar outcomes were also documented for luxury items such as radios and beds.

As for the level of participation in both formal and informal financial markets, an important finding is that, over time, the amount of average informal loans of the participant households appears to be decreasing due to the intervention. We also found, however, that the programme had an impact in increasing amount of loans from formal financial institutions but this is decreasing overtime. We speculate this may be due to the fact that the programme beneficiaries now have enough of a financial standing to finance their own businesses. However, further investigation needs to be undertaken to determine its root causes. Similarly for vulnerability in terms of the level of calorie intake and per-capita food expenditure, the CFPR participants had cleared both in the short run and as well as over the long run.

Significant investments are being made in fighting poverty all over the world but sustainably addressing the problems of the ultra-poor remains a key concern. Public expenditures for the poor are not insignificant. For example, the Government of Bangladesh spends about 5 per cent of its public expenditure for the poor. But numerous accounts suggest that these programmes often suffer from substantial leakages either through corruption or mismanagement, rendering them toothless. However, a judicious and evidence-based use of such small amounts of money may bring greater benefits. What is necessary for sustainable reduction in extreme poverty is to design the mechanism for the delivery of the funds so that the outcome is maximised. This paper finds that the CFPR approach as implemented by BRAC is clearly an effective strategy to fight ultra-poverty in a sustainable manner.

Chapter 7

How far does a big push really push? Mitigating ultra-poverty in Bangladesh

In Collaboration with: Farzana Misha, Jinnat Ara and Ellen van de Poel

7.1 Introduction

Despite numerous development interventions implemented across the world, poverty remains endemic with more than a billion people living under the $1.25 poverty line. Over the past decade however, increasing attention had been directed towards the extreme poor, most recently epitomized by the World Bank president Jim Yong Kim declaring the goal to eradicate extreme poverty by 2030 (The World Bank, 2013). Extreme poverty diverges from typical poverty in degrees of deprivation, duration and in magnitude (Chronic Poverty Research Centre, 2008). The absence of formal or informal safety nets makes it difficult for the extreme poor to access basic essentials like education, healthcare and finance, making them highly vulnerable to even the slightest shock that then results in a downward spiral of further deprivation.

Despite having one of the poorest economies in the world, Bangladesh is acclaimed for its impressive progress in poverty reduction and achieving many of the Millennium Development Goals (Chowdhury et al., 2013). Although the number of people living in poverty and ultra-poverty decreased substantially between 2000 and 2010, the proportion of the ultra-poor remains considerable at 21 percent (Gimenez et al., 2013; National Institute of Population Research and Training (NIPORT) et al., 2013). Given the distinctive characteristics of the extreme poor, they are often circumvented by the conventional development interventions and financial services. Programs need to be designed with specific targeting mechanisms to prevent the poorest from being excluded or from opting out voluntarily (Navajas et al., 2000). Hailed as one of the biggest breakthroughs against poverty, the microfinance programs that serve over 25 million poor people in Bangladesh have been found to have positive impacts on both income and vulnerability (Hashemi and Rosenberg, 2006). A wide body of evidence confirms its efficacy for the moderate poor. In most cases however, the ultra-poor are unable to derive any benefits from it due to entry restrictions into such programs, while at the same time, many of the ultra-poor are reluctant to join such programs in the first place due to social and economic restrictions (Evans et al., 1999; Hulme et al., 2001; Matin and Hulme, 2003).

BRAC, one of the largest non-government organizations (NGOs) in the world, has been directing its resources to mitigate the multifaceted aspects of poverty in Bangladesh since inception in 1972. BRAC recognized that most interventions precluded the participation of the ultra-poor which led to the inception of the program *Challenging the Frontiers of Poverty Reduction: Targeting the Ultra-Poor* (CFPR) in 2002 with the explicit intention of reaching down to the ultra-poor and pushing them out of ultra-poverty and ready them to join some of the mainstream poverty alleviation programs such as microfinance. It is important to note that BRAC's definition of ultra-poverty diverges from the $1.25/day definition of World Bank's extreme poverty. The ultra-poor are defined by BRAC to be the lower subset of the extremely poor, earning less than $0.60-$0.70 per day (BRAC, 2013). The CFPR required the participants to enroll for a period of two years during which time they were provided a productive asset base, continuous and intensive training sessions, both in-class and hands on, on maintaining such assets, a food subsidy, education, and social and legal support. They were also provided with nutritional supplements and had access to BRAC's own panel doctors free of charge throughout the duration of participation. So far success of the CFPR program has been well recognized and replicated within and outside Bangladesh. More than eight organizations have adopted and are currently implementing versions of the program

in Bangladesh. BRAC is also providing technical assistance to organizations in Afghanistan, Canada, Ethiopia, Haiti, Honduras, India, Pakistan, Peru and Yemen for program implementation.

The program combines a number of targeting methods and poverty assessment tools to ensure high inclusion rates of the ultra-poor (Sulaiman and Matin, 2006).A number of studies have confirmed the positive effects of CFPR on participants' health and health related expenditures (Ahmed and Hossain, 2007; Ahmed, 2006; Prakash and Rana, 2006) food security status (Ahmed and Rana, 2005; Haseen and Sulaiman, 2007), and socioeconomic status measured through income and the type of employment (Rabbani et al., 2006). While most of the studies looked at short term impacts (2002-2005), some have investigated medium term effects (2002-2008). Raza, Das, and Misha (2012), Das and Misha (2010) and Krishna, Poghosyan, and Das (2012) found the program to have significant and consistent positive impacts on per capita income, income generating assets and food security during the six year period. As the main goal of CFPR was to give the ultra-poor a big push to break the cycle of poverty, it is important to establish the program's impact in the longer run. This paper is the first to demonstrate impact of CFPR seven years after completion of the program. We study effects on a large battery of outcomes; both directly incentivized by the program and more general indicators of socioeconomic status, and investigate heterogeneity of effects across baseline employment status and gender. This paper is arranged as follows: Section 2 describes the CFPR program and gives an overview of the literature evaluating its effectiveness, Section 3 describes the data and the methods, Section 4 presents the results and Section 5 provides a discussion and conclusion.

7.2 CFPR Background

7.2.1 Description of the program

The CFPR program was first launched in Rangpur; Kurigram and Nilphamari districts of northern Bangladesh as a pilot in 2002 that was scaled up subsequently to cover 15 more districts and 100,000 participant households or nearly a half million population over the next four years.[80] The northern districts of Bangladesh typically suffer from acute seasonal unemployment post-cropping seasons, more commonly referred to as *monga*. As the program explicitly targeted the poorest of the poor, a thorough multi-step targeting procedure was utilized. Based on the poverty and vulnerability mapping by the World Food Program, the poorest districts and sub-districts were initially identified. Subsequently, in consultation with field level BRAC staff who have an in-depth knowledge of the localities, specific villages were designated as targets. Prior to the identification process, BRAC field staffs spent a few days in each location building rapport and gathering information on every single household and their inhabitants. This allowed them to identify the invisible households who often fail to show up in survey or census data (Sulaiman and Matin, 2006). Special attention was paid to female headed households as they generally

[80] Positive short term impact and learnings from the first phase paved the way for CFPR Phase II, which was operational from 2007 to 2011 and encapsulated approximately 300,000 households across 40 districts. Issues specifically faced during the first phase such as heterogeneity among the ultra-poor were incorporated into a diverse intervention package. This paper however deals exclusively with the first phase of the program.

are the most vulnerable and are most likely to be overlooked (Sulaiman and Matin, 2006).[81] During the next stage of the targeting process, a community wealth ranking exercise known as Participatory Rural Appraisal was carried out (Chambers, 1994). According to these wealth rankings, a little more than 25% of the households were initially identified as ultra-poor. The community defined ultra-poor were then re-checked against the inclusion and exclusion criteria.[82] A final round of verification was carried out by senior level BRAC field staff to generate the final list of households eligible for CFPR support. This final verification was conducted using a structured questionnaire to collect information on, among others, demographic characteristics, land ownership and cultivation, housing, income, assets, NGO involvement and loans, and benefits from government or other sources.

The program operated on a two year cycle during which time the participants received a multitude of services. The initial 18 months included the transference of a choice of income generating assets (IGAs) such as livestock, poultry, vegetable gardening and nursery, small grocery shop, inputs (such as vaccinations and housing for the animals) and intensive training to maintain the IGAs, business development training, subsistence allowance so that the participants can devote time to look after the assets, access to health care, and awareness training. The last 6 months involved weaning the participants from the program support through extensive confidence building workshops and mobilizing local social support.

Post selection into the program, the first step was identification of the most appropriate IGA for a participant taking into account prior experience, capability of enterprise management as well as local market, environment, and social factors. The most popular IGAs were livestock and poultry rearing. Participants received training customized according to the enterprise they chose with an average value of the assets transferred of Bangladeshi Taka (BDT) 6,000.[83] Upon receipt of the IGAs, the participants began receiving additional inputs required to maintain the assets such as vaccinations, housing for the animals, weekly follow-up by BRAC staff for technical advice and supervision, and receive a weekly subsistence allowance of BDT 70 to make up for any earnings foregone as an opportunity cost of taking care of the assets. Additionally, the participants were required to save BDT 10 each week.

The health support package included BRAC-supported health volunteers, *Shasthya Shebikas*, in the villages, CFPR program staff, and a panel doctor at the local BRAC health program. The *Shebikas* were selected from each locality and trained as front-line providers of preventive and curative services for common illnesses (Standing and Chowdhury, 2008). In cases of a severe illness, members in the participant households received services from the panel doctor free of charge. Free antenatal and postnatal care including various supplements were also provided to expectant mothers.

The social development (SD) component of the program was designed to create knowledge and awareness among the participants about their rights. In addition to providing regular awareness on topics such as dowry and child marriage, the SD component also mobilized local elite support for the

[81] These households often reside within other households maintaining a clientelistic relationship with the latter, though in all intents are purposes are individual economic entities (Emran et al., 2014).

[82] The inclusion criteria include (3 of 5 have to be met): Household owns less than 10 decimals of land; Main source of income is by female member begging or working as domestic help; no active male adult (female household head); School-aged children working for pay; No productive or income generating assets. The exclusion criteria, of which all have to be met, include: No Active female member in the household; Microfinance participants; Household members receiving government benefits such as old age pensions.

[83] The exchange rate in 2002 was USD $1=Bangladesh Taka (BDT) 69.28 while the PPP $1=BDT 16.25 during the same time.

participants to counteract possible crowding out of informal insurance because of program participation. A forum of the local elites called *Gram Daridro Bimochon Committee* (GDBC or Village Poverty Alleviation Committee) formed in every intervention village helped in this regard.

Soon after the two year period, soft and flexible microfinance loans were availed to the interested participants to further incentivize investment in income generating activities, and discourage detrimental sources of finances such as high interest money lenders (Huda et al., 2011).

The expenditures per participating household for the two year duration were approximately BDT 20,000 (or US$ 292). This figure includes the costs related to the income generating assets provided, administration and also for all the support provided over the entire duration of the program.

7.2.2 A review of the short and medium term effects of CFPR

A number of studies have evaluated the impacts of CFPR on the short and medium term on various outcomes. Most of this literature relies on a comparison (over time) between those households selected into CFPR and those identified as poor by the PRA but not selected into the program. We come back to the comparability between both groups in the methods section.

A qualitative study by Ahmed and Hossain (2007) found that the free health care services provided by the panel doctors were quite helpful in the sense of the service being available and easily accessible. Positive effects (8% increase) were found on women's self-reported health status in the short run (2002-2004) (Ahmed, 2006; Prakash and Rana, 2006) and substantial improvement was found in both self-reported and measured food-security status with the average calorie intake going up from 1750 to 2138 per day during 2002-2005 (Ahmed and Rana, 2005; Haseen and Sulaiman, 2007).

In the short term (2002-2005), participation had significant positive effects on income and food security, household durables, and livestock, but no discernible impact on ownership of cultivable land, physical value of the household and other productive assets (Emran et al., 2014; Haseen and Sulaiman, 2007; Rabbani et al., 2006; Walker and Matin, 2006). Raza, Das, and Misha (2012) additionally report an increased probability of having savings from less than eight percent in 2002 to 94 percent in 2005 and 98 percent in 2008.

It was found that after two years of program support and provision of some flexibilities in borrowing from BRAC microfinance, in the short and medium run (2002-2008), more than two thirds of CFPR graduates could participate in the formal credit markets (Shams et al., 2011). Overall, participation in the CFPR program benefitted the participants significantly over the short term and up to 5 years after graduation.

7.3 Methods

7.3.1 Data

This paper utilizes a four round panel data set collected in three northern districts (Nilphamari, Kurigram and Rangpur) of Bangladesh, generally characterized as among the poorest in the country (National Institute of Population Research and Training (NIPORT) et al., 2013). The baseline survey canvassed 5626 households during the first quarter of 2002. The second survey took place around the same time

in 2005 consisting of 5228 households. The third round was undertaken in 2008 comprising of 4549 households following which, the final survey of 4144 households was implemented in 2011. No new households were added on in between the waves and no households that drop out re-appear in any of the following waves. Tests for attrition bias are discussed in section 3.3. Respondents were typically the main female member of the household. The surveys were held with the entire group of households identified as the poorest within the village through the PRA exercises, so the sample includes both those households that were selected into the program and those that were identified as poor but were not selected for program participation.

For the purpose of this paper, the main outcomes of interest were divided into two groups: primary outcomes that were immediately affected by program participation (number of livestock, poultry and big trees and financial market participation) and secondary ones, affected over time, that relate to households' social and economic status (per capita income, having any cash savings, occupation, ownership of homestead or cultivable land, ownership of other income generating assets such as rickshaws and luxury items such as radios or TVs, characteristics of the household dwelling (roof), food security status and social capital). Directly influenced outcomes are defined net of program transfer. While previous papers on the program's impact in short and medium terms have not distinguished between directly or indirectly affected outcomes, the outcome indicators measured have largely remained consistent (Das and Misha, 2010; Krishna et al., 2012; Raza et al., 2012).

Landholdings not only aid the livelihood, but also convey additional status and prestige in a predominantly agrarian country such as Bangladesh (Krishna et al., 2012). However, due to high inflow of funds from sources such as remittances, land prices face constant inflationary pressure and in general were seen to be beyond the reach of the participants prior to the program.[84] Considering the little variation in the amount of landholdings in our sample[85], we investigate effects of CFPR on the probability of owning any homestead or cultivable land. We use *tin* (corrugated iron sheet) for roof material as a proxy to gauge the quality of living conditions.

Occupational choices are important targets of the CFPR program. The explicit intention is that the program engenders self-reliance in terms of the participants' occupational choices and at the same time, a move away from crisis or dead-end occupations such as day labouring, working as household maids or begging. Information on employment activities and income earned (also the value of income in-kind) was obtained from all members of the household with respect to the year preceding the survey. The amounts were aggregated to arrive at the total household income. Avenues that yielded the highest remuneration over the preceding year were designated as the main source of income in this study. Self-employment in either the agricultural or non-agricultural sector was grouped together and labeled as entrepreneurs.[86] Those begging or working as maid in other households were grouped together as they predominantly represented female headed households and sample sizes by themselves limit separate

[84] Despite the global economic downturn, Bangladesh received over USD $7 billion during the latter half of 2013 as remittances, nearly 13% of the national GDP (Gimenez et al., 2013).

[85] Ninety-seven percent of respondents own less than 10 decimals of homestead land while more than half reported owning none at the baseline. Ninety-seven percent of the surveyed responded negatively to owning any amount of cultivable land.

[86] Entrepreneurial activities also include households that have skilled labor such as carpenters and blacksmiths to households that sell milk from livestock or eggs from poultry.

analysis. As day labourers represent a substantial proportion of the sample, they were designated a stand-alone category while an '*other*' category consisted of miscellaneous forms of employment.

Socioeconomic hierarchy plays a significant role in everyday life for the members of these communities. As a proxy for social capital, information was collected on whether the members of the households had been invited to others' homes or at social gatherings.

As for food security, the questionnaire asked if the households were able to manage at least two full meals daily. Financial market participation is measured by whether or not households have formal loans, typically from microfinance institutions, or informal loans, from money lenders or loan sharks, generally at high interest rates.

All models control for baseline household information on demographics, socioeconomic status and regional characteristics. Furthermore we include indicators that reflect whether or not households meet the CFPR selection criteria. The exact definition of all outcome and control variables is provided in Tables 7.1 and 7.2.

7.3.2 Analytical Techniques

The effect of CFPR participation is identified by comparing the trend in outcomes of those households identified as poor but not selected into the program with those that were selected into the program. While according to the program description, households selected for the CFPR need to meet 3 of the 5 inclusion criteria and all exclusion criteria, we find limited differences in the distribution of these characteristics across the treated and control groups (see Figure 7.1). This suggests that the in- and exclusion criteria are not implemented very strictly and precludes the application of a regression discontinuity analysis. Although three quarters of the participants fall within the poorest quartile, Emran, Robano, and Smith (2014) also confirm there are a considerable number of households who met all the selection criteria but were excluded from the program and vice versa (Sulaiman and Matin, 2006).[87]

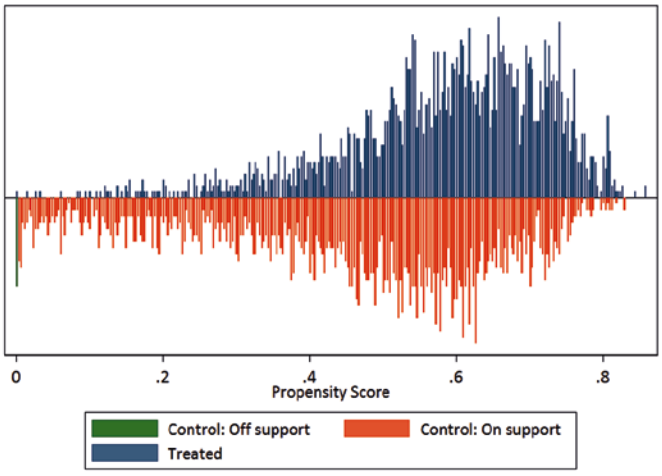

Figure 7.1: Distribution of propensity score across treated and control group

[87] Emran et al (2014) use these assignment errors as an instrument to identify impact of the program. This approach however leads to small samples of treated and controls, and does not identify the effect of the program on the full sample of treated.

We estimate effects of CFPR using difference-in-differences (DiD) regression with weights obtained from propensity score matching (Ho et al., 2007; Imbens and Wooldridge, 2009). Combining regression and propensity score weighting has the advantage of only requiring one of the two approaches, the specification of the propensity score or the regression model, to be correctly specified – the "double robustness" property. We first estimate propensity scores ($p(X_0;\gamma)$) from a probit model of the treatment indicator on the baseline values (X_0) of all outcome variables presented in Tables 7.1 and 7.2 (see Annex 7.1 for the results of the probit model). Figure 7.1 illustrates the overlap in the distribution of the propensity scores across treated and control groups, with 1120 households not being on the common support. In a second step, we use linear regression where we weigh the objective function by the inverse probability of treatment or non-treatment. More specifically, we construct weights equal to 1 for treated observations and $p(X_0;\hat{\gamma})/(1-p(X_0;\hat{\gamma}))$ for control observations. The regression model we estimate is the following:

$$Y_{it} - Y_{i0} = \alpha_t + X_0\beta_t + \delta_t D_i + \varepsilon_{it} \qquad \text{i} = 1,\ldots,\text{N; t} = 2005,2008,2011 \tag{1}$$

where the subscript *i* refers to households and *t* to the year. *Y* is the outcome of interest, and *D* represents the treatment group indicator. Y_{i0} refers to the outcome in the year we are comparing with. In a first step we compare outcomes in 2005, 2008 and 2011 to those in 2002 to establish effects in respectively the short, medium and long term, and thereafter we compare 2008 with 2005 and 2011 with 2008 to quantify the incremental effects. The average treatment effect on the treated is captured by δ_t. Controlling for baseline characteristics X_0 weakens the identifying assumption to the requirement that, conditional on baseline observables[88], outcomes for the treated group would have evolved in the same way as those of the controls in the absence of treatment. We cannot formally test for the plausibility of this parallel trends assumption, nor do we have pre-treatment trends in outcomes, but the substantial overlap in the distribution of the propensity scores does suggest that both groups are comparable in observables at baseline. Note that model (1) is only estimated on the sample that is on the common support.

To explore heterogeneity of effects across type of employment and the gender of the household head, we estimate the propensity scores and regression models separately for each subgroup.

Robustness of results is confirmed to using non-parametric matching techniques combined with DiD (Blundell and Dias, 2009). Results are reported in the Annex 7.2. We use a Nearest Neighbor (NN) matching (using 5 neighbors) algorithm as this resulted in the largest average bias reduction (21.9 percent to 1.1 percent, with the bias no longer significant). Table 7.3 illustrates the reduction in bias obtained from the matching for each of the variables included in the propensity scores. While we acknowledge that t-tests are heavily dependent on the sample size (Imbens and Wooldridge, 2009), it is reassuring that differences in observables between matched treated and controls are small and in no instance statistically significant. The average treatment effect on the treated from the NN matching with DiD is obtained as follows (Blundell and Dias, 2009).

$$ATT_{MDiD} = \sum'_{i\in T}\{[Y_{it} - Y_{i0}] - \sum'_{j\in C}\breve{w}_{ij}[Y_{jt} - Y_{j0}]\}\, w_i \tag{2}$$

[88] We prefer controlling for baseline characteristics as opposed to time-varying characteristics because with such a comprehensive intervention the latter could be affected by program participation.

where T and C represent the treated and control group, $\breve{w}_{ij}$ is the weight placed on comparison observation j for the treated observation i, and w_i accounts for the reweighting that reconstructs the outcome distribution for the treated sample.

Table 7.3: Summary statistics across treated and control group and bias reduction after matching

Variable	Treated	Control	Difference	Percent Bias	Reduction in Bias (%)
percapinc	2502	2507	-6	-0.30	97.8
csav	0.08	0.09	0.00	-1.10	96.7
forinformaloan	0.01	0.01	0.00	-0.20	99.2
owl_h_c	0.01	0.01	0.00	-0.40	98.7
hvlu	865	884	-19	-0.80	97.3
entrepreneur	0.18	0.18	0.00	-0.40	98.3
dayl_beg_maid	0.78	0.78	0.00	0.30	98.9
cowbull_a	0.04	0.04	0.00	-0.30	98.9
goatsheep_a	0.10	0.11	-0.01	-1.80	72.8
rickvan_a	0.01	0.01	0.00	0.00	100.0
radiotv_a	0.01	0.01	0.00	-0.50	94.2
wcal	0.14	0.14	0.00	0.30	97.4
duckhen_a	0.86	0.87	-0.01	-0.40	98.0
egg	0.43	0.46	-0.03	-1.50	86.4
metduck	15.88	15.18	0.70	0.10	99.2
less10	0.95	0.94	0.01	3.50	88.8
nogovbenf	0.80	0.80	0.01	2.40	33.5
fem14to55	0.35	0.36	0.00	-0.90	96.2
hhedusex	0.28	0.30	-0.02	-1.00	95.4
twicemeal	0.53	0.51	0.02	4.30	87.8
pro_asset	0.42	0.44	-0.01	-2.90	91.8
prohvlu	425	440	-16	-0.70	97.7
rooftin	0.43	0.41	0.02	4.60	79.0
rickvan	0.01	0.01	-0.01	-1.00	93.4

Notes: Results show means of and differences in baseline characteristics for the treated and controls in the matched sample (using nearest neighbour matching with 5 neighbours). The Percent Bias refers to the percentage difference of the sample means of the treated and control as a percentage of the square root of the average of the sample variances among the treated and control (Leuven and Sianesi, 2003).

7.3.3 Attrition

As the data covers a time span of 9 years, the rate of attrition is relatively high with 72 percent of the households being observed in every wave. Households that drop out of the survey at any of the waves are less likely to own physical assets such as livestock or homestead land at baseline, but none of the other baseline characteristics were significant predictors of attrition later on in the panel (see Annex 7.1). In our models, attrition is only a problem to the extent that it correlates with participation in the CFPR program. The rate and pattern of attrition across the years were found to be comparable across treated and control group (a total of 32 percent and 33 percent respectively across the 9 year period).[89] To test for attrition bias we use the test suggested by Verbeek and Neijman (1992); we add a leading selection indicator to the DiD model (1) and do a t-test for the significance of this indicator (Jones et al., 2013). The null of no effect was rejected only for the models on entrepreneurship (p-value=0.03) and having a tin roof (p-value=0.07), suggesting very limited problems of attrition bias.

7.4 Results

7.4.1 Summary Statistics

Summary statistics of all control variables across survey waves and across treated and controls are presented in Table 7.1. Focusing on the baseline statistics, we see that working aged women (14-55 years) represent about a third of the sample (36 and 31 percent respectively for the treated and control groups). Female headed households are more prevalent in the treated group (73 percent) as compared to the control group (57 percent). The household size is significantly smaller for the treated households throughout the years (3.55 versus 3.80). In terms of education, the control group appears to fare better in general. Nearly 92 percent of household heads in the treated group have had no education compared to 87 percent in the control group at the baseline. Trends in control variables are relatively limited and similar across treated and control group, confirming limited problems of selective attrition.

Summary statistics of outcome variables are presented in Table 7.2. Results illustrate that the treated are significantly worse off than the control at the baseline in terms of livestock ownership. By 2011 however, the treated are more likely to have a greater number of cows/bulls (0.72 versus 0.42 for the control) and a greater number of poultry (1.95 versus 1.83 for the control). The treated are also disadvantaged in terms of participation in financial markets at baseline. The percentage of households having cash savings is more than double in the control group compared to the treated (21 percent versus 9 percent respectively). Only 4 percent of the treated (versus 32 percent of controls) reported participating in the formal financial market such as NGOs while 37 percent (versus 30 percent of treated) reported borrowing money from high interest money lenders in the year preceding the survey. By 2011 the proportion of formal loans has increased drastically among the treated (up to 53 percent), compared to both baseline and the control.

[89] The rate of attrition for the treated and controls were 6.16 and 7.99 percent respectively until 2005. Between 2005 and 2008, the rates were around 10 percent for both groups, while between 2008 and 2011, the attrition was around 15 percent for both groups. The attrition rate was the highest during the last interval due to one of the local BRAC branch offices closing down, leading to similar declines in the number of observations for both the treated and the control groups.

Table 7.1: Summary statistics of outcome variables

Variable name	Description	2002		2005		2008		2011		P-Value
		Treated	Control	Treated	Control	Treated	Control	Treated	Control	
		Directly Affected Outcomes								
Livestock and nursery										
cowbull_a	Number of cow/bulls	0.035***	0.189	1.599***	0.223	1.288***	0.443	0.717***	0.42	0.000
goatsheep_a	Number of goats/sheep	0.098**	0.131	0.513***	0.158	0.588***	0.321	0.293	0.28	0.516
duckhen_a	Number of poultry	0.829***	1.454	2.495	2.564	3.655***	2.545	1.953	1.826	0.009
bigtree_a	Number of big trees	0.516***	1.333	0.518***	0.713	1.774**	2.024	2.009***	2.688	0.652
Financial Participation										
csav	Has cash savings (1/0)	0.085***	0.205	0.899***	0.303	0.912***	0.38	0.924***	0.534	0.000
formalloan	Has formal loans from NGOs (1/0)	0.036***	0.319	0.510***	0.225	0.553***	0.375	0.533***	0.424	0.000
informalloan	Has informal loans from money lenders(1/0)	0.373***	0.295	0.407**	0.529	0.234***	0.322	0.267**	0.339	0.000
		Indirectly Affected Outcomes								
Socioeconomic Status										
percapinc	Annual per capita households income (BDT)	2529***	2825	3701***	3360	7678***	5979	9051***	8264	0.000
Occupation										
emp_entrepreneur	entrepreneur (ag/non-ag) (1/0)	0.197***	0.319	0.331**	0.312	0.432***	0.324	0.318	0.328	0.013
emp_begging_maid	begging or working as maids (1/0)	0.177***	0.092	0.107**	0.09	0.099	0.098	0.148***	0.091	0.040
emp_daylabourer	employed as day laborer (1/0)	0.591***	0.537	0.521***	0.553	0.421***	0.515	0.490***	0.541	0.121
emp_other	employed in other categories (1/0)	0.030***	0.048	0.042	0.039	0.046**	0.060	0.043	0.039	0.245

Table 7.1: *(Continued)*

Variable name	Description	2002		2005		2008		2011		P-Value
		Treated	Control	Treated	Control	Treated	Control	Treated	Control	
		Indirectly Affected Outcomes *(C0ntinued)*								
Asset holdings										
owl_h	Owns any homestead land (1/0)	0.457***	0.597	0.491***	0.556	0.644*	0.669	0.608***	0.651	0.000
owl_c	Owns any cultivable land (1/0)	0.018***	0.078	0.054***	0.076	0.084	0.075	0.034***	0.061	0.517
rickvan_a	Owns any rickshaws or cycle vans (1/0)	0.010***	0.031	0.065*	0.055	0.088***	0.063	0.062	0.066	0.375
rooftin	Roof of the house made of tin (1/0)	0.445***	0.553	0.792***	0.771	0.924*	0.916	0.934	0.925	0.003
radiotv_a	Owns any radios/TVs (1/0)	0.008***	0.018	0.027	0.032	0.034*	0.025	0.030**	0.042	0.875
Food Security										
twicemeal	Usually can have at least two meals a day (1/0)	0.516***	0.686	0.859***	0.763	0.898***	0.836	0.885	0.884	0.000
Social Capital										
invited	Invited to non-relatives' homes	0.245***	0.29	0.374***	0.333	0.495***	0.431	0.499	0.52	0.733

Notes: The *P*-value refers to a test of the null hypothesis of no difference in trends in outcome variables between treated and controls. *, **, *** indicate significance at the 10%, 5% and 1% respectively. [Observations: 5,626 households in 2002; 5,320 in 2005; 4,831 in 2008; 4121 in 2011]

Table 7.2: Summary statistics of control variables

Variable name	Description	2002		2005		2008		2011		P-Value
		Treated	Control	Treated	Control	Treated	Control	Treated	Control	
Demographics										
fem14to55	proportions of working aged (14-55) women	0.362***	0.307	0.366***	0.319	0.356***	0.326	0.343**	0.323	0.277
hhsex	male head of household (1/0)	0.573***	0.737	0.560***	0.731	0.563***	0.732	0.549***	0.726	0.615
hhsize	household size	3.55***	3.802	3.996***	4.316	4.347***	4.668	4.114***	4.441	0.678
Socioeconomics										
hh_edunone	no education of household head (1/0)	0.917***	0.865	0.859***	0.788	0.856***	0.811	0.865***	0.804	0.329
hh_eduprim	primary education of household head (1/0)	0.064***	0.095	0.113***	0.157	0.105***	0.137	0.104***	0.146	0.333
hh_edumidhigh	secondary/higher education of household head(1/0)	0.019***	0.04	0.028***	0.054	0.038**	0.051	0.031***	0.049	0.830
Selection Criteria										
less10	households owns less than 10 decimals of land (1/0)	0.952***	0.864	0.925***	0.88	0.869	0.859	0.924***	0.876	0.420
nogovbenf	households receives no government benefits (1/0)	0.816*	0.83	0.875***	0.92	0.812***	0.861	0.820***	0.862	0.048
pro_asset	household owns any income generating assets	0.407***	0.58	0.929***	0.679	0.914***	0.773	0.748***	0.707	0.133
Location										
Rangpur	household located in Rangpur site (1/0)	0.321	0.311	0.311	0.301	0.319	0.301	0.285	0.267	0.859
Nilphamari	household located in Nilphamari site (1/0)	0.308	0.292	0.32	0.303	0.321	0.302	0.33	0.315	0.610
Kurigram	household located in Kurigram site (1/0)	0.371	0.397	0.369	0.396	0.361	0.398	0.385	0.418	0.743

*Notes: T*he P-value refers to a test of the null hypothesis of no difference in trends in covariates between treated and controls. *, **, *** indicate significance at the 10%, 5% and 1% respectively. [N: 5,626 households in 2002; 5,320 in 2005; 4,831 in 2008; 4,121 in 2011]

Similar trends were also seen for the other outcomes. While treated individuals had lower per capita income than controls at baseline (BDT 2530 and BDT 2825 respectively), their income increased significantly faster over time (BDT 9051 for the treated and BDT 8264 control in 2011). The treated sample had lower rates of self-employment (20 percent) than controls (31 percent), and higher rates of unyielding occupations (18 versus 9 percent). By 2011 however, the treated have become more likely to be self-employed (to 31 percent) and less likely to be working as beggars or maids (to 15 percent), while there have not been much changes regarding employment among the controls. The majority of the respondents among both groups depended on day labouring as the main source of their income (60 and 54 percent for treated and controls respectively), and this proportion fell by 10 percentage points (pp) for the treated by 2011.

Regarding land and asset ownership, the treated were worse off at baseline with only 45 percent of the treated having any homestead land compared to 60 percent of controls. By 2011, this proportion had gone up by 15pp within the treated sample, while not much happened within the control group. The proportion owning any cultivable land was quite low for both the treated and control groups at baseline (2 percent and 8 percent respectively), and increased only slightly for the treated group by 2011. Owning houses with roofs made of tin was more common within the control group at baseline (10pp difference), but by 2011 the large majority of both groups had them (over 90 percent for both groups).

Finally, respondents in the treated group had a lower degree of food security at baseline, with 52 percent being able to manage two meals a day (versus 67 percent of controls). By 2011, the treated group had caught up. Similar patterns emerged for the probability of being invited to village social events.

In sum, we see a pattern of the treated group being worse off at baseline but catching up, and even overtaking, the controls by 2011. Table 7.3 shows baseline characteristics across both groups within the matched sample (using NN matching), and confirms that no significant differences between both groups are left post-matching.

In the next section, we present which part of the difference in trends between both groups can be attributed to participation in the CFPR program.

7.4.2 Impact of CFPR participation

The upper panel of Table 7.4 shows CFPR impact on primary outcomes primarily affected by program participation, as estimated by the weighted regression models. Analysis reveals that, net of program transfer, CFPR had led to an increase in the number of cows or bulls owned by 1.5 by 2005, but this effect decreased by 0.5 in each of the following waves leaving the overall effect over the full period to be only 0.4. Also the number of goats and sheep, increased by 0.39 by 2005 but this effect somewhat dissipated by 2011. As for the number of poultry, the largest effect was observed in 2008 (1.6) and diminishes afterwards. It should be noted that the decline in effects on the number of livestock over time is not so much driven by a reduction within the treated group, but rather by a catch up among the controls.[90]

[90] The average number of cows/bulls increased 20 fold during the entire period whereas the number of goats/sheep and poultry more than doubled.

Table 7.4: Effects of the CFPR program across different time periods

Variables	D1 (2005-2002)	D2 (2008-2002)	D3 (2011-2002)	D4 (2008-2005)	D5 (2011-2008)
	Primary outcomes				
Livestock and nursery					
cowbull_a	1.466***	0.936***	0.392***	-0.529***	-0.537***
goatsheep_a	0.387***	0.289***	0.023	-0.095**	-0.252***
duckhen_a	0.453***	1.630***	0.389***	1.187***	-1.214***
bigtree_a	0.014	0.289*	0.032	0.285**	-0.242
Financial Participation					
csav	0.619***	0.559***	0.374***	-0.061***	-0.176***
formalloan	0.324***	0.227***	0.132***	-0.098***	-0.098***
informalloan	-0.114***	-0.109**	-0.083***	-0.013	-0.027
	Secondary outcomes				
Socioeconomic Status					
percapinc	826.587***	1,493.693***	1,295.178***	675.893***	-120.614
Occupation					
emp_entrepreneur	0.077***	0.155***	0.039**	0.065***	-0.118***
emp_begging_maid	-0.054***	-0.064***	-0.024*	-0.012	0.046***
emp_daylabourer	-0.029*	-0.084***	-0.028	-0.056***	0.049**
Asset holdings					
owl_h	0.048***	0.087***	0.072***	0.038**	-0.009
owl_c	0.009	0.040***	-0.002	0.030***	-0.038***
rickvan_a	0.033***	0.035***	0.006	0.004	-0.022**
rooftin	0.066***	0.036***	0.023**	-0.031**	-0.016
radiotv_a	0.007	0.019***	0.003	0.013*	-0.013
Food Security					
twicemeal	0.140***	0.083***	0.023*	-0.055***	-0.064***
Social Capital					
invited	0.085***	0.110***	0.007	0.027	-0.099***

Notes: Results obtained by linear regression with inverse propensity weighing. *, **, *** indicate significance at the 10%, 5% and 1% respectively.

Regarding financial participation, we find that the program substantially increased the probability of having any cash savings (62pp). This effect diminishes somewhat in later years, but even when comparing 2011 to 2002, the effect of CFPR remains substantial at 37pp. Program participation also increased the probability of borrowing from formal sources (by 32pp) by 2005 while at the same time reduced the probability of borrowing from informal sources (by 11pp). Mid-term effects are smaller at 23pp and 11pp respectively, and long-term effects are further reduced but remain significant, at least for taking up formal loans (13pp). Again these diminishing effects appear to be driven by a catch up of the

controls rather than a decline in the percentage with cash savings, and formal or informal loans among the treated.

In general, we see quite strong effects on most of the directly incentivized outcomes in the short and medium term, and some decline in effects in the long term. This is not necessarily undesirable if it reflects households using some of the assets and credit to develop alternative activities that also lead to welfare improvements. The following paragraphs discuss effects on the secondary outcomes that reflect household socioeconomic and social status (lower panel of Table 7.5).

At par with the existing evidence, the effects of CFPR on per capita income are very large and increasing over the medium term until 2008 (BDT 827, which represents 33% of the baseline average in 2005 and an additional effect of BDT 675 by 2008). We find no significant change in the impact between 2011 and 2008, although the sign is negative, which appears related to some catch up among the controls in the later period.

Moving to the effects on the primary source of income, we find the program to increase the probability of engaging in entrepreneurship in either the agricultural or non-agricultural sector until 2008 (9pp by 2005 and an additional 7pp by 2008). However, this effect diminishes significantly by 12pp by 2011, which renders the long-term effect to be rather limited (4pp). Program participation also significantly decreased the probability of households undertaking unyielding occupations such as day labouring, working as maids or begging as the main source of income until 2008 (8 pp by 2005 and an additional 7pp by 2008), however, the effects also taper off by 2011. Given the relatively stable employment patterns that are observed in the control group (Table 7.1), it appears that while the program caused an initial shift to more entrepreneurial employment activities, by 2011 many treated households reverted back to their baseline occupations.

CFPR participation increases the probability of owning homestead land by 5pp by 2005 and by an additional 4pp by 2008, and the effects stagnate afterwards. Effects on the probability of owning cultivable land, which would typically be more expensive, are smaller, with only a significant effect of 4pp by 2008 that disappears by 2011. Program participation increased the probability of having a tin roof in the short term (7pp), but this effect reduces by half in 2008 and further by 1pp in 2011, which appears to be driven by a catch up in the control group as by 2011 the majority of households in both groups have a tin roof. While we find very little impact on ownership of radios or televisions (2pp in 2008), the effects of program participation on food security are quite substantial in the short term. The probability of being able to secure two meals a day is increased by 14pp in 2005. By 2008 however, the effect is reduced by 6pp and disappears by 2011 as close to 90 percent of households in both the treated and control group are able to manage two meals a day by 2011.

Finally, participation in the CFPR program increased the probability of being invited to others' houses or social event in the short (9pp) and medium-term (11pp). By 2011, the control group is also more socially involved, which causes the CFPR effect to disappear.

Table 7.5: Heterogeneity of impact by baseline employment

Sub-groups (defined in 2002)	Entrepreneur			Begging or working as maids			Day labouring		
	D1 (2005-2002)	D2 (2008-2005)	D3 (2011-2008)	D1 (2005-2002)	D2 (2008-2005)	D3 (2011-2008)	D1 (2005-2002)	D2 (2008-2005)	D3 (2011-2008)
Per capita income (N: 1,509)	819***	727**	784**	863***	598	-811	818***	626***	-131
emp_entrepreneur (N: 1,282)	0.131***	-0.031	-0.034	0.157***	0.129**	-0.221***	0.062***	0.079***	-0.110***
emp_begging_maid (N: 1,495)	0.007	-0.032*	0.021	-0.222***	-0.024	0.198***	-0.001	0.002	0.026**
emp_daylabourer (N: 1,292)	-0.083***	0.059	-0.062	0.082*	-0.127**	0.053	-0.070***	-0.090***	0.085***
emp_other (N: 1,514)	-0.055*	0.004	0.074**	-0.017	0.022	-0.03	0.009	0.01	-0.001
Observations	*No. of entrepreneurs at baseline*			*No. of working as maids/begging at baseline*			*No. of day labourers at baseline*		

Notes: Results obtained by linear regression with inverse propensity weighing. *, **, *** indicate significance at the 10%, 5% and 1% respectively.

7.4.3 Heterogeneity of impact on income and employment

Having established average treatment effects on the full sample of treated, we now investigate heterogeneity of these effects across baseline employment and across the sex of the head of the household. Female headed households, generally more vulnerable and disadvantaged, constitute an important group in the CFPR target population and because of their distinct socioeconomic and cultural characteristics; it is interesting to investigate whether CFPR participation affects them differently as compared to their male counterparts (see Annex Table 7.3 for baseline comparisons). We focus on effects on income and employment, both for reasons of parsimony, but also because these could be considered most important reflections of (long term) socioeconomic status.

The first rows of Table 7.5 and 7.6 show the heterogeneity of CFPR impact on income by baseline employment status and sex of the household head. Results reveal that while short term income effects are relatively similar across employment categories (approximately BDT 850 on average), they diverge in the following years. Between 2005 and 2008, baseline entrepreneurs experience an increment of BDT 727 and day labourers an increase of BDT 626, the increment for beggars or maids are no longer significant (and even negative). In the subsequent period between 2008 and 2011, only baseline entrepreneurs gain a further BDT 784.

Table 7.6 shows income effects across female and male headed households. It appears that in the short term, the income effect for female headed households is more than double that of male headed households (BDT 1279 and BDT 525 respectively). Additional gains made in the following period (2008 to 2011) are comparable between the female and male headed households (BDT 562 and BDT 654 respectively) while neither group experiences further significant gains in the long run. This finding somewhat contradicts those from the heterogeneity by baseline employment characteristics, which suggested that the program is most effective in the long term for those households that could be considered better-off at baseline. Next we investigate to what extent the changes in income effects can be related to changes in the employment trajectory.

The bottom four rows of Table 7.5 show how the employment trajectories caused by the program vary across baseline employment categories. For those already engaged in entrepreneurial activities at baseline (columns 1-3), we see a pattern in the short term of CFPR sustaining their business (as compared to the control group). The treated are 13.1pp more likely to have remained entrepreneurs, and less likely to have become day labourers, as compared to the control group. Thereafter we see relatively little changes in occupation, except for a 7.4pp increase in the probability of having other types of professions (such as those with salaried employment, part-time workers, politicians) as compared to the controls between 2008 and 2011. The stability in entrepreneurial activities and a move to other professions, within this subgroup of baseline entrepreneurs does seem to coincide with long lasting income effects as was discussed before.

Households that were mainly begging or working as maids at baseline (columns 4-6) were initially pushed by CFPR towards entrepreneurship (16pp increase) or day labouring (8pp increase). This effect of increasing entrepreneurial activities seems to have persisted in 2008, with a further move from those that initially had gone into day labouring to starting their own business. However, by 2011 it appears that of those who were working as maids or begging in the baseline and had subsequently switched over to entrepreneurship over the years, nearly all had reverted back to their original profession or shifted to

day labouring. This pattern could explain the absence of income effects after the initial period discussed before.

Table 7.6: Heterogeneity of impact by gender of household head

	Female headed households			Male headed households		
Sub-groups (defined in 2002)	**D1 (2005-2002)**	**D2 (2008-2005)**	**D3 (2011-2008)**	**D1 (2005-2002)**	**D2 (2008-2005)**	**D3 (2011-2008)**
Per capita income (N: 1,509)	1279***	563**	-216	525***	654***	-10
emp_entrepreneur (N: 1,282)	0.138***	0.088***	-0.131***	0.057***	0.058***	-0.098***
emp_begging_maid (N: 1,495)	-0.107***	-0.007	0.061*	-0.002	-0.015*	0.041***
emp_daylabourer (N: 1,292)	-0.009	-0.070**	0.014	-0.058***	-0.041**	0.054**
emp_other (N: 1,514)	-0.023	-0.01	0.056**	0.003	-0.002	0.002

Notes: Results obtained by linear regression with inverse propensity weighing. *, **, *** indicate significance at the 10%, 5% and 1% respectively.

We see a similar trend for those households that start off as day labourers, although changes are less drastic. CFPR participation causes a 6pp increase in the probability of becoming entrepreneurs by 2005, and this probability further increases by 8pp by 2008, but starts to decrease by 2011 (11pp). This decrease appears to be driven by a move back to day labouring, and some households even go into begging or working as maids. Again this pattern could be related to the pattern in income effects, which had increased over the first two periods but started to decrease by 2011 (although not significantly).

Changes in employment trajectories across the gender of the household head (last four row of Table 7.6) reveal that program participation caused female headed households to move from begging or working as a maid to undertaking entrepreneurship (14pp increase) by 2005. The probability of entrepreneurial activities further increased by 9pp between 2005 to 2008 precipitated by a move away from working as day labourers. Between years 2008 and 2011 however, the probability of entrepreneurship dropped again by 13pp while the probability of working as maids or begging increased by 6pp, indicating that some of these households reverted back. This is also reflected in the income effects, that become negative (although not significantly) by 2011.

Male headed households participating in CFPR are also initially more likely to move to entrepreneurial activities (from day labouring), but effects are smaller than for female headed households which could explain the smaller short term income effects for this group. Similar as their female counterparts, the trend of increased entrepreneurial activities is sustained in 2008, but reverts thereafter. By 2011, most of those households that started a business have moved back to day labouring or even begging/working as maid.

7.5 Discussion and concluding remarks

The program *Challenging the Frontiers of Poverty Reduction (CFPR): Targeting Ultra Poor* was initiated in Bangladesh in 2002 by BRAC, one of the largest non-governmental organizations in the world. The CFPR program was implemented with the explicit goal of targeting the ultra-poor and graduating them to a socioeconomic status where they could avail themselves to mainstream poverty alleviation programs such as microfinance. A number of studies have confirmed its short (2002-2005) and medium term (2005-2008) positive impacts on income, ownership of productive and non-productive assets, food security and health (Ahmed et al., 2009; Ahmed, 2006; Haseen and Sulaiman, 2007; Rabbani et al., 2006; Raza et al., 2012). This study is the first to use a 4 round panel data over 9 years to identify the effects of the program in the long run (2002-2011). Furthermore, this paper investigates heterogeneity of program impact across baseline employment characteristics and gender of the household head.

In line with existing studies, we find that outcomes that are directly affected through different program inputs such as the livestock, cash savings and financial market participation are positively affected in the short term (Raza et al., 2012). Between medium and long term, however, effects often start to slow down. This is driven more by a catch up of the control group than by a fall-back among participants. Similar trends were observed for some of the other outcomes such as income, land and asset holdings, food security and social capital. Income effects for example, were very substantial in the short and medium term with CFPR leading to income gains of respectively 33 percent (by 2005) and 60percent (by 2008). Thereafter though still significantly higher, income growth among the controls seems to have caught up, causing the CFPR effect to appear less striking.

There are perhaps a couple of reasons for the control group to catch up. Firstly, the catch-up may largely be attributable to actions taken by BRAC. Prior to launching of the CFPR, BRAC launched a systematic awareness campaign throughout the country that considerably raised the public discourse about the plights of the ultra-poor, especially in the *monga* affected areas (BRAC, 2013). These campaigns led to an considerable influx of public and private funding geared towards the eradication of ultra-poverty and ultimately led to trebling of public spending in social safety nets in the study districts in the 2002-2011 periods. Similarly, the number of NGOs catering to the ultra-poor in this district nearly quadrupled (Ahmed and Bari, 2011; Khandker, 2012), which led to a universal increase in welfare in the region. In 2000, the World Food Program had estimated that the rate of extreme-poverty in 20 of the 23 sub-districts were between 35-55 percent, but dropped considerably by 2010 (World Food Program et al., 2014). Secondly, as both treated and control households are located in close proximity to one another, there is the possibility of spill over effects of CFPR, especially in the long run. Looking at short term spill over effects within the second phase of the CFPR program, Raza and Das (2014) find significant increases in livestock rearing as one of the main sources of income among control households.[91] Qualitative evidence shows that the information provided by CFPR on vaccines for livestock, and on proper housing models for animals is easily disseminated among neighboring households. This increase in knowledge and understanding leads to an overall growth of such industries within the communities

[91] In some localities in Kurigram and Nilphamari district, a watered-down version of CFPR has been implemented in the 2007-2011 period. This could potentially bias downward our impact estimates. We have conducted a separate analysis for the Rangpur district, in which no such programs were implemented before 2011 and confirmed that estimates were qualitatively similar to those in the full data, and quantitatively slightly larger (see Annex 7.4).

(Hossain and Matin, 2007). This was also found to be true for social capital as forums such as the Village Poverty Alleviation Committees or GDBC are purposefully formed for this function. GDBCs have been seen to visibly reduce discrimination against poorer social classes in almost all villages they operate in and ensure increased social status (Rafi et al., 2010). This finding of 'catching up' by control households due to the program itself (CFPR in our case) is a new dimension in the impact assessment of development programs. This demands further analysis and studies.

The decline in long term CFPR effects on employment status appears not so much driven by catch up among the controls due to spill overs. We see a shift from begging, working as maids and day labouring to entrepreneurial activities in the short and medium term, but many CFPR households revert back to their baseline employment by 2011. To the extent that moving away from unyielding occupations was an important aim of CFPR, this finding suggests that its long term capacity building may require further thought and consideration. Recent qualitative studies provide some insights for this shift. Intergenerational transfer of assets is extremely common in Bangladesh. Case studies show that once the children are married, especially sons, the parents are likely to transfer most of their assets to them, including homestead land and continuing with their initial occupation on the side. Alternatively, as the project concluded seven years prior to the last round of the survey, household members who had traditionally assisted in maintaining the program assets had moved (marriage, death, employment related migration and so forth) and the original receivers may have lost control over the assets. In cases where the assets actually remained with them, lack of assistance had forced them to get rid of these assets and go back to the de facto occupations (Bandiera et al., 2013; Das and Misha, 2010).

Results also show that initial income gains are quite similar across different categories of baseline employment, but in the long run, CFPR impact on income is greater for those households who were entrepreneurs at the onset of the program than for those starting off as beggars or day labourers, confirming earlier findings of Emran, Robano, and Smith (2014) of CFPR benefitting most of those in the upper income deciles. Furthermore, we also find that those working as day labourers in the baseline are more likely to switch over to entrepreneurship and remain so in the long run compared to those who worked as maids or begged for a living before the program.

As female headed households are typically amongst the most vulnerable, special attention is paid to them during the course of the program. Despite being worse off at the baseline, the female headed households appear to substantially outperform their male counterparts, both in income and employment effects, over the short term while the income gains are comparable in medium and longer terms. This could be due to the fact that with handholding they are more likely to move to (and remain engaged in) entrepreneurial activities as compared to their male counterparts. Anecdotal evidence and field based experiences indeed suggest how that for these female headed households, participating in programs such as the CFPR is often the only opportunity to improve their livelihoods in a meaningful way and thus acts as a strong motivation to perform well. Additionally, it has also been seen that women, when in charge of allocating productive and financial assets of the family, are more likely to precipitate greater positive change (Baden and Milward, 1995). Depleting long term effects, however, are likely to precipitate by the vulnerabilities the female headed household faced in the first place and further handholding, beyond the 24 month period, may be in order to push them forward.

There are some limitations to this paper. Most importantly, the selection of treated and control groups was not done in a randomized way, leaving the possibility for unobservable heterogeneity to violate the parallel trends assumption. The substantial overlap in the propensity scores and similarity of baseline characteristics across both groups in the matched sample does, however, suggest that the matching techniques used can adequately correct for baseline differences in observable characteristics. A second limitation, which is almost inevitable with data over such a long time period, is the possibility of other events disproportionally affecting either the treatment or control group. Findings from the second phase of CFPR, which was set up as a randomized control trial (RCT), do confirm the short and midterm effects on income and employment, which suggests that our results are not merely an artefact of the purposive selection of treated and controls (Bandiera et al., 2013).

In sum, the evidence in this paper presents an interesting picture on the impact of CFPR. While confirming earlier positive findings, we also see that effects tend to decelerate over the long term, driven mainly by catch-up among the control households. The success of the program can be considered three-fold. Firstly, the program itself was successful in bringing its participants out of ultra-poverty and keeping them so nine years after participation.[92] Secondly, through spill over effects, CFPR positively affected households in the program's vicinity. Lastly, substantially raising public discourse precipitated greater efforts from both state and non-state bodies to join the movement against ultra-poverty. However not without its caveats, CFPR effects, especially on employment, are more likely to be maintained in the long term for those households that could be assumed to have more intrinsic capabilities (entrepreneurs) or motivation (female headed households). This brings into light the conundrum of whether encouraging entrepreneurship as an occupation is suitable for all. Rigorous qualitative investigations to identify reasons why many households revert back to their original occupation would be crucial for formulating policy advice regarding CFPR. These results raise the question of whether one big push can be sufficient to alleviate ultra-poverty across the board, and whether more frequent support sustained over a longer time period can have more long-lasting impact.

[92] While the average per capita income per day among the treated was $0.43, by 2011, it increased to $1.53.

Chapter 8

Discussion and conclusion

This thesis evaluated two forms of social safety-nets in South Asia. Chapters 2 through 4 dealt with health insurance schemes in India while Chapters 5 through 7 evaluated an integrated approach to ultra-poverty alleviation in Bangladesh.

8.1 Evidence from health insurance schemes in India

The analysis of the two health insurance schemes, namely the Community Based Health Insurance Schemes offered in three sites (Kanpur Dehat, Vaishali, and Pratapgarh) and the nationally implemented *Rashtriya Swasthya Bima Yojana* (RSBY) focused on the effects of the scheme on healthcare utilization and financial protection.

In terms of design features, the CBHI schemes evaluated here are supported by NGOs but entirely financed and run by the local community in which they operate. The schemes provide outpatient coverage from Rural Medical Practitioners (RMPs) on a capitation basis. This mode of contract offers patients unlimited consultations and free medicines from the RMPs. The schemes also offer cover inpatient costs of up to Rs. 4000 per person per year (PPPY) at a cost of about Rs. 195 PPPY (1.5% of annual per capita expenditure). Using a randomized control trial, we found no tangible effects of CBHI on healthcare utilization or financial protection in two of the three sites (Kanpur Dehat and Vaishali). In the third site (Pratapgarh), the CBHI scheme was associated with a drop in the likelihood of seeking outpatient care.

The subsequent chapter studied a number of aspects of the RSBY in Uttar Pradesh and Bihar. The programme targets households below the poverty line (BPL) and provides cashless protection against hospitalization costs. Families of up to five persons pay an annual premium of INR 30 per year for protection against hospitalization costs of up to INR 30,000 in any RSBY designated hospitals. We began by assessing the determinants of enrolment and dropout, followed by an assessment of the link between scheme membership and healthcare utilization and financial protection among below-poverty-line (BPL) households. We found that those in poorer wealth groups, lower educated households or belonging to scheduled castes/tribes were more likely to enrol and stay in the programme. However, presence of adverse selection is apparent given households with a higher proportion of members with chronic conditions were more likely to enrol and had a lower likelihood of dropping out. Insurance related awareness played a role in determining a household's decision to enrol and continue with RSBY's coverage. Results also indicated that insurance uptake is influenced by accessibility to the empanelled hospitals. Association between RSBY membership and healthcare utilization for insured seemed to be rather limited. With regard to financial protection, only insured households in Bihar experienced a reduction in out-of-pocket spending and lower debt as a result.

What do the results tell us about the usefulness of such schemes in terms of reaching Universal Health Coverage (UHC)? In their current form both schemes fall short of expectations. The CBHI has a number of attractive features that, if executed as designed, should yield benefits for the insured. However, the absence of external financing coupled with voluntary enrolment translated into limited uptake, a shallow risk-pool and low coverage (the ceiling for inpatient coverage for example was a third of the average expenses per hospitalization). Utilizing the existing microfinance infrastructure

to roll out the scheme is attractive given that the groups already have some degree of cohesion and insurance related information is easily disseminated. However, the fact that these local partner NGOs are primarily project driven means the schemes will cease to operate once the funding has depleted. This is highlighted by the fact that two of the three schemes shut down by the time the project ended in 2014. The capitation system, while attractive on paper considering the insured would be able to consult the RMPs on demand for basic medication and referrals, did not perform as expected, mostly due to disincentives (these providers were contracted at the rate of Rs. 40 per insured per month compared to an average cost of Rs. 125 per visit). The providers as a result reneged on the contract by diminishing the quality of care and medication provided, thereby deterring the patients from visiting them. As for the RSBY, one of its largest blind-spots is its voluntary enrolment. Despite considerable subsidisation, the voluntary nature of the scheme inevitably precludes the participation of the poorest or the healthier members of the target population. To the detriment of the scheme, this gives rise to adverse selection as shown in the thesis.

The analysis presented in the thesis yields several implications if the Government of India intends to use RSBY or for that matter, other publicly-funded insurance schemes as a way to reach UHC. One of the main shortcomings of both the schemes studied here is their attempt at inducing demand for health care in the presence of considerable supply-side constraints. Healthcare facilities in India are largely unregulated, resulting in considerable variation in quality of services. This issue is further pronounced in poor rural areas. While the CBHI schemes examined in this thesis lack the scope and size to foster such changes, the RSBY has distinct advantages in this arena. The fact that the RSBY performed better in Bihar, where scheme roll-out was matched with supply-side investments, than Uttar Pradesh suggests that easing supply-side constraints through physical and human resource investments are likely to increase the attractiveness of insurance. Excellent examples are available from neighbouring countries. When Thailand began planning the Universal Coverage Scheme in the aftermath of the Asian financial crisis of 1997, the GDP per capita was only $1900 (System Health Insurance Research Office, 2012). Through massive overhaul of the existing healthcare system and financial commitment, the scheme set an important precedent for its middle-income peers.

Second, considering the increasing prevalence of non-communicable diseases which mostly require outpatient care, suggests that any insurance scheme attempting to reach UHC should also cover outpatient care which is not the case with regard to RSBY. This shortcoming is highlighted by the fact that CBHI participants in Vaishali, where RSBY penetration was quite high, opted only for outpatient coverage. The absence of outpatient care has more perverse consequences. In the Chinese New Cooperative Medical System for instance, Wagstaff et al. (2009) find that the lack of outpatient coverage increased out-of-pocket payments and reduced impact on financial protection. Insurance coverage is likely to be effective in a context where supply is available and providers have the appropriate financial incentives. A recent collaboration across seven Asian countries entitled 'Health, Equity and Financial Protection in Asia' concluded that provider incentives are equally important in terms of facilitating access and providing financial protection as the insurance coverage itself (HEFPA, 2013). Finally, serious thoughts must be given to extend facilities to address related vulnerabilities such as lack of education (to understand and fully utilize the available options of the programme), and ways to enhance accessibility (for instance

through reimbursement of transportation costs, compensation for lost wages and empanelling local hospitals that are easily reachable).

8.2 Integrated approach to ultra-poverty reduction in Bangladesh

The latter half of the thesis evaluated the impact of an integrated approach to ultra-poverty alleviation. Entitled, *Challenging the Frontiers of Poverty Reduction: Targeting the Ultra-Poor* (CFPR), the programme was launched in the poorest districts of Bangladesh in 2002. The programme provided income generating assets valued at approximately USD $140 and a comprehensive livelihood development training programme to encourage entrepreneurship. Once selected, the participants enrolled in the programme for two years. The evaluation examined the effect of the programme on various outcomes and across different time periods: short term (two years post- graduation), medium-term (four years post-graduation) and long-term (seven years post-graduation).

Using a randomized control trial, we first evaluated the short term effects of CFPR on the nutritional status of the participants and spill-over effects on households in communities where the programme took place. Though not explicitly a target of the CFPR, considerable improvement was seen among ultra-poor household members, most pronounced for children below 5 (the likelihood of being underweight among these children for instance reduced by 19 percentage points). Results also indicated that the programme had positive externalities. Nutritional status among non-participants in treatment communities experienced an increase in nutritional indicators, once again most pronounced for those under 5 (corresponding reduction in the likelihood of being underweight by 9 percentage points). Two factors are important to note: first, magnitudes of the spill over effects were generally half of the effects on the treated, and second, the spill-over effects were restricted to other poorer households in the community. The increase in children's nutritional status was largely driven by increased duration of exclusive breastfeeding. For older individuals, improvements were created through increased food security and hygiene practices. Assessment of the heterogeneity of impact showed greater benefits among female headed households while the effects were found to be gender neutral among individuals. The two subsequent chapters assessed the impact of the project over the medium and long term using quasi-experimental methods. These outcomes included income, employment choices, productive and non-productive asset holdings, food security and social capital. We found that the effects of CFPR nearly doubled between the short and medium terms. The effects on income levels for instance, increased to BDT 1493 (in the medium term) compared to BDT 826 during the short term. The participants increased their productive asset base (such as livestock, rickshaws and cultivable land) and expanded their businesses through increased financial market participation. In the long-term, while the outcomes for the participants remained substantially higher than the control, there were no incremental effects between the medium and long term (income, for instance, was BDT 1300 higher among the treated and significant at conventional levels).

There are several potential explanations for these long term trends. First, we found that the reduction in the effects over time were largely driven by a catch-up among the controls rather than receding effects for the participants. To the extent that this catch up was driven by controls disproportionally

benefiting from other social safety programs or benefiting from spill-over effects of CFPR, this may have led to an underestimation of the true long term effects of CFPR. Bandiera et al. (2013) for example, using a randomized control trial of a subsequent phase of the CFPR programme, found that incomes increased and more hours were devoted to working among non-participants in treated areas. The fact that we also saw a reversal to less entrepreneurial type of occupations in the long term among the participants, while employment patterns among the controls are very stable over time, does however suggest the effects of CFPR will taper off in the long run.

Another explanation could be found in the fact that participants transferred the CFPR endowments to their children when they were no longer able to care from them on their own. This hypothesis is supported by the fact that CFPR's effects on income (including transfers) remain stable during the later years, while the productive asset base diminishes.

Lastly, our results suggest that entrepreneurial aptitude played a role in sustaining the earlier gains made from CFPR. This is reflected by households working as entrepreneurs were more likely to continue and maintain a higher level of income. Additionally, non-entrepreneurial households may have cashed out in the long-term altogether due to absence of skills that contributed to their de facto socioeconomic status in the first place.

Widely regarded as a successful intervention in fighting ultra-poverty, the CFPR has encompassed nearly a million households in Bangladesh alone since 2002 and has been replicated across 20 countries. Our findings from this thesis merit further discussion and suggest some policy suggestions. Of note are the impact and spill-over effects on nutritional status. Malnutrition is an endemic issue in Bangladesh despite the various interventions that have been implemented (see Alive and Thrive implemented by the Gates foundation for example). The fact that CFPR not only positively affected its participants, but also those in the vicinity is very encouraging. While it is difficult to distil the impact of individual components of the programme, weekly meetings on healthy behaviours of BRAC officials with participants are likely to have driven the nutritional improvements, especially those among young children. The relatively large spill-over effects on the other poor living in the same communities, both on healthy behaviours such as breastfeeding and nutritional outcomes, does suggest that the effects of CFPR can be long lasting and affect the wider community positively. A more focused investigation of which component of the program is driving the nutritional increases among both the treated and control groups could provide useful evidence to support the continuing efforts in combating malnutrition. Second, the long-term impact trajectories create a sobering effect. However, these trends need to be taken with a grain of salt considering the study relies on quasi-experimental design with a control group that may have been contaminated due to spill-over effects. We strongly suggest using the subsequently implemented randomized control trials to verify these trends. On a more cautious note, while implementing CFPR, BRAC does assume some degree of homogeneity among the participants across the country. As the thesis suggests, especially for the long-term, a "one size fit all" policy may not necessarily be the best way forward considering not all ultra-poor participants are uniformly equipped to maintain entrepreneurial activities by themselves. Finally, the CFPR is a capital intensive programme (approximately USD$292/ participant household). Sinha et al (2005) for instance conduct a short-term cost effectiveness study of CFPR and conclude $5.01 return for every dollar invested. Using a randomized control trial across six

countries where the CFPR was replicated, Banerjee et al (2015) arrive at similar conclusions. However, in light of the long term trends, a study on returns over the longer term is warranted.

8.3 Conclusion

While both the social safety net programmes examined in this thesis target marginalized households and both focus on women to deliver their services, they are very different in scope and size. While the first set of schemes focuses on *ex-ante* protection against healthcare expenditures and facilitating access to care, the latter provides *ex-post* support to ultra-poor households to bring them out of a resource and skill poor environment. Though both types of programmes are designed to assist the most marginalized, the desired outcomes are not equally achieved. The relatively high initial uptake of the CBHI program is likely related to its small scale and local context specific features. The small size of the program has also led to a limited budget, shallow benefit package, and weak provider incentives which have hampered the impact of the scheme on access to affordable health care. Also the RSBY, which is much larger in terms of population and service coverage, falls short of its full potential due to supply side constraints and weak regulatory framework.

The CFPR addresses a variety of vulnerabilities using an integrated approach. Not only does the programme succeed in achieving its primary goals, it also demonstrates positive externalities. The findings of this thesis, however, raise concerns regarding the sustainability of the scheme, both from the demand and the supply side. On the one hand, the considerable expenses of implementation are cost-effective until the medium-term. The long term impact however questions whether further investment is needed to re-invigorate the lost momentum for the participants.

In the case of Bangladesh, social protection mechanisms implemented predominantly by non-government organization, are largely responsible for bringing essential services such as education, healthcare and access to finance to millions. However, complacence from the public sector leaves the population open to a range of vulnerabilities. For instance, healthcare expenditures in Bangladesh are almost entirely out of pocket (93% in 2013). The poor and the near-poor are exposed to risks of falling further into poverty due to catastrophic healthcare costs. Furthermore, being a rapidly urbanizing country is increasing the prevalence of non-communicable diseases (NCDs). Much like India, it can be expected that NCDs will eventually claim the lion's share of healthcare expenses in Bangladesh, thereby further exacerbating the situation (Dror and Vellakkal, 2012). Finally, the thesis highlights the importance of designing credible evaluation strategies *a priori*, so as to provide meaningful feedback before scaling up proposed interventions. For instance, the scale-up of CFPR was heavily driven by scientific evidence which led to changes in scheme design. For considerably larger scale programmes such as the RSBY, integrating evaluation strategies and programme implementation at the outset is even more important. Indeed, it may be argued that it should be a priority to embed credible evaluations in programme implementation strategies so as to avoid having to re-invent the wheel.

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Annexure

Annex Tables

Annex 2.1: Pooled and site level pattern of healthcare seeking behaviour in the sample areas

Description	Pooled	Kanpur Dehat	Pratapgarh	Vaishali
Probability of seeking care for acute illnesses (past month) (1/0)	0.86	0.81	0.87	0.90
Probability of seeking care for chronic illnesses (past month) (1/0)	0.70	0.70	0.65	0.76
Type of health worker seen for acute illnesses				
None	0.14	0.19	0.13	0.10
Other	0.02	0.02	0.01	0.03
NDAP	0.48	0.52	0.47	0.44
Pharmacist	0.09	0.04	0.13	0.11
Public	0.07	0.05	0.10	0.04
Private	0.20	0.18	0.16	0.28
Type of health worker seen for chronic illnesses				
None	0.30	0.30	0.34	0.24
Other	0.02	0.03	0.03	0.02
NDAP	0.21	0.25	0.20	0.17
Pharmacist	0.10	0.04	0.13	0.09
Public	0.10	0.10	0.10	0.08
Private	0.27	0.28	0.20	0.40
Type of health facility visited for inpatient care				
PHC/CHC	0.07	0.12	0.04	0.05
District Hospital	0.15	0.19	0.21	0.07
Private Hospital	0.44	0.52	0.40	0.41
Nursing Home	0.34	0.17	0.35	0.47

Notes: The sample for chronic illnesses and inpatient care exclude children younger than 13 years of age.

Annex 2.2: Self-reported reasons for choosing a healthcare provider for acute, chronic and inpatient conditions by site

	Kanpur Dehat				Pratapgarh				Vaishali			
	Cheapest	**Closest**	**Best**	**Other**	**Cheapest**	**Closest**	**Best**	**Other**	**Cheapest**	**Closest**	**Best**	**Other**
						Acute Illnesses						
Private	7	90	115	26	7	78	129	8	17	118	186	67
Public	11	30	17	6	22	90	34	9	9	13	20	14
Pharma	19	28	7	2	34	112	23	9	30	66	38	13
NDAP	103	403	168	34	30	463	160	11	74	331	148	62
Other	8	18	2	2	5	6	4	1	5	9	12	10
						Chronic Illnesses						
Private	7	47	119	37	10	65	210	25	7	54	174	134
Public	16	19	28	17	28	66	53	15	12	1	28	33
Pharma	10	10	6	2	42	121	40	10	14	29	26	15
NDAP	15	112	51	13	19	203	87	12	9	83	37	31
Other	5	6	6	5	13	8	10	7	5	1	7	5
						Inpatient Care						
PHC/CHC	3	4	7	3	2	3	0	0	4	1	1	2
District Hospital	2	4	6	13	3	1	17	7	3	1	2	5
Private Hospital	3	7	45	20	4	5	30	13	1	11	36	20
Nursing Home	0	4	10	10	1	5	33	6	2	10	54	13

Notes: Each figure for acute, chronic and inpatient care represents the number of cases (3573, 2280 and 437 respectively) reported. The sample for chronic illnesses and inpatient care exclude children younger than 13 years of age. Responses are not mutually exclusive.

Annex 2.3: Predicted means/standard deviations (SD) of estimated travel time and cost by provider

Variable	Other		NDAP		Pharmacist		Public		Private	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Pooled Data										
Average travel time to the provider (minutes)	24	32	17	20	19	19	39	54	38	41
Average cost for first visit (in INR) for acute illness	81	124	128	210	69	189	155	301	380	1117
Average cost for first visit (in INR) for chronic illness	304	780	246	378	154	278	570	1130	929	1743
Kanpur Dehat										
Average travel time to the provider (minutes)	17	31	24	26	29	30	56	45	54	51
Average cost for first visit (in INR) for acute illness	85	130	148	251	83	174	213	480	454	1832
Average cost for first visit (in INR) for chronic illness	420	1211	312	490	103	139	645	1055	1245	2741
Pratapgarh										
Average travel time to the provider (minutes)	26	23	18	15	18	12	34	61	32	34
Average cost for first visit (in INR) for acute illness	108	150	105	139	46	62	123	166	208	300
Average cost for first visit (in INR) for chronic illness	153	171	224	335	139	285	376	1020	671	1248
Vaishali										
Average travel time to the provider (minutes)	28	37	9	12	16	18	32	39	32	34
Average cost for first visit (in INR) for acute illness	64	105	129	219	92	275	176	324	434	774
Average cost for first visit (in INR) for chronic illness	449	773	215	297	209	287	902	1331	970	1325

Annex 3.1: CBHI package details in 2012 (wave 2)

Sites	Pratapgarh	Kanpur Dehat	Vaishali
Annual CBHI premium per person/per year (INR)	250	192	197
Coverage for hospitalization			
Fees (maximum coverage per episode, INR)	4000	3000	-
Family Coverage	30,000	25,000	-
Wage loss (per day, INR)[1]	100	50	100
Transport (maximum coverage per episode, INR)[2]	100	250	-
Accident Coverage	-	400	-
Family Coverage	-	1000	-
Coverage for outpatient care			
Fees (INR)	Unlimited	Unlimited	Unlimited
Lab tests (per year, INR)[3]	-	-	200
Imaging tests (per year, INR)[4]	-	-	300
Coverage for maternity care	-	-	-
Caesarean (per episode, INR)	-	-	-

"-" indicates "Not Included in package"; [1] For Pratapgarh wages losses covered for the 3rd-7th day, for Kanpur Dehat 3rdh-6th day, for Vaishali 4th-9th day; [2] For hospitalization of more than 24 hours.

Annex 3.2: Self-reported reasons for choosing a healthcare provider for acute, chronic

	Individuals	Households
Baseline survey 2010	21,372	3,685
Offered insurance in 2011 – wave 1	7,716	1,334
Second survey 2012	18,405	3,318
Offered insurance in 2012 – wave 2	6,493	1,183
Third survey 2013	18,322	3,307
Offered insurance in 2013 – wave 3	5,695	997

Notes: 4,285 individuals were added on to the surveys in 2012 and 2013 respectively by means of marriage, birth and split households. By 2012, a total of 14,209 individuals (7,716 + 6,493) or 2,517 (1,334 + 1,183) individuals had been offered insurance and are considered the treatment group while those who had not been offered insurance by 2012 are considered the control group. At the time of the baseline survey the number of individuals in wave 1 and wave 2 were 7,716 and 7,178, respectively or 14,894 individuals were expected to be treated by 2012 but due to attrition the actual number was 14,209 individuals. The pooled sample consists of 58,099 individuals (21,372 + 18,405 + 18,322).

Annex 3.3: Baseline means of outcome variables across treated (offered CBHI by 2012) and control (not offered CBHI by 2012) groups disaggregated by site

	Kanpur Dehat				Pratapgarh				Vaishali			
	Treated (mean)	Control (mean)	p-value (1)	N	Treated (mean)	Control (mean)	p-value (2)	N	Treated (mean)	Control (mean)	p-value (3)	N
Reporting an illness (1/0)	0.321	0.326	0.722	6265	0.373	0.356	0.150	7814	0.32	0.308	0.293	7293
Health care utilization (1/0)												
Sought outpatient care conditional upon reporting illness	0.791	0.774	0.411	2021	0.793	0.729	0.000	2877	0.837	0.868	0.064	2309
Sought care from RMP conditional upon reporting illness	0.448	0.427	0.384	2021	0.339	0.338	0.944	2877	0.329	0.365	0.108	2309
Sought inpatient care	0.028	0.031	0.532	6265	0.022	0.023	0.766	7814	0.032	0.042	0.026	7293
Health care expenditures (conditional upon use)												
Outpatient care expenses (INR)	783	672	0.385	2021	524	459	0.248	2877	738	755	0.822	2309
(standard deviation)	(2977)	(1585)			(1448)	(1254)			(1658)	(1686)		
Hardship financing for outpatient care (1/0)	0.23	0.239	0.660	2021	0.077	0.062	0.173	2877	0.272	0.269	0.879	2309
Inpatient care expenses (INR)	17000	22000	0.178	179	10000	13000	0.165	171	9608	7863	0.212	254
(standard deviation)	(19447)	(28461)			(11219)	(16557)			(11605)	(8825)		
Hardship financing for inpatient care (1/0)	0.532	0.439	0.244	181	0.31	0.255	0.457	171	0.735	0.685	0.399	254
Health care expenditures (full sample)												
Outpatient care expenses (INR)	252	219	0.443	6265	196	164	0.134	7814	236	232	0.878	7293
(standard deviation)	(1726)	(958)			(920)	(780)			(999)	(998)		
Inpatient care expenses (INR)	481	681	0.144	6265	218	296	0.204	7814	305	331	0.685	7293
(standard deviation)	(4302)	(6251)			(2201)	(3145)			(2661)	(2397)		

Notes: Columns show baseline means disaggregated by sites across the treated and control groups. P-values (1-3) refer to t-tests performed across the treated and control groups at baseline. The number of observations varies depending on the outcome. The sample size is 6265 in Kanpur, 7814 in Pratapgarh and 7293 in Vaishali.

Annex 3.4: Baseline means of control variables across treated (offered CBHI by 2012) and control (not offered CBHI by 2012) groups

	Pooled			Kanpur Dehat			Pratapgarh			Vaishali		
	Treated (mean)	Control (mean)	p-value (1)	Treated (mean)	Control (mean)	p-value (2)	Treated (mean)	Control (mean)	p-value (3)	Treated (mean)	Control (mean)	p-value
Demographics												
Female children 0-13	0.178	0.183	0.383	0.160	0.164	0.654	0.163	0.171	0.409	0.209	0.212	0.752
Female aged 14-55 years	0.290	0.289	0.825	0.287	0.286	0.933	0.309	0.308	0.957	0.273	0.269	0.723
Female older than 55 years	0.038	0.040	0.524	0.035	0.038	0.646	0.041	0.049	0.134	0.037	0.032	0.281
Male aged 0-13 years	0.193	0.199	0.364	0.170	0.173	0.813	0.193	0.189	0.654	0.213	0.231	0.081
Male aged 14-55 years	0.263	0.252	0.095	0.309	0.304	0.687	0.255	0.243	0.238	0.232	0.219	0.219
Male older than 55 years	0.038	0.038	0.932	0.039	0.035	0.544	0.039	0.041	0.603	0.036	0.037	0.894
Household size	6.749	6.853	0.011	6.842	7.184	0.000	7.263	7.323	0.445	6.127	6.046	0.127
Socioeconomics												
No education	0.367	0.394	0.000	0.313	0.331	0.166	0.353	0.353	0.997	0.430	0.493	0.000
Primary education	0.267	0.268	0.961	0.252	0.252	0.973	0.255	0.269	0.197	0.293	0.280	0.246
Secondary education	0.293	0.260	0.000	0.339	0.306	0.013	0.311	0.293	0.101	0.234	0.184	0.000
Higher secondary education	0.073	0.078	0.130	0.096	0.111	0.075	0.081	0.086	0.484	0.043	0.043	0.901
Expenditure tertile: Low	0.395	0.372	0.002	0.245	0.239	0.625	0.501	0.448	0.000	0.413	0.402	0.374
Expenditure tertile: Mid	0.300	0.337	0.000	0.297	0.317	0.110	0.289	0.345	0.000	0.315	0.344	0.019
Expenditure tertile: High	0.305	0.291	0.046	0.458	0.444	0.291	0.211	0.207	0.710	0.272	0.255	0.134
Household belongs to scheduled tribe/ caste	0.339	0.294	0.000	0.233	0.326	0.000	0.399	0.306	0.000	0.367	0.254	0.000
Self-employed in agriculture	0.108	0.101	0.131	0.205	0.177	0.011	0.065	0.071	0.288	0.070	0.070	0.947
Self-employed in non-agriculture	0.045	0.044	0.945	0.025	0.035	0.022	0.051	0.036	0.002	0.054	0.061	0.211

Annex 3.4: *(Continued)*

	Pooled			Kanpur Dehat			Pratapgarh			Vaishali		
	Treated (mean)	Control (mean)	p-value (1)	Treated (mean)	Control (mean)	p-value (2)	Treated (mean)	Control (mean)	p-value (3)	Treated (mean)	Control (mean)	p-value
Socioeconomics *(Continued)*												
Other employment	0.022	0.026	0.079	0.019	0.021	0.629	0.033	0.044	0.012	0.015	0.011	0.278
Casual wage labourer	0.090	0.089	0.898	0.049	0.057	0.159	0.102	0.091	0.141	0.112	0.114	0.811
Not working	0.051	0.057	0.081	0.043	0.064	0.001	0.066	0.065	0.870	0.043	0.043	0.961
Doing housework	0.203	0.201	0.751	0.211	0.205	0.580	0.203	0.206	0.752	0.195	0.191	0.705
Student	0.481	0.481	0.980	0.448	0.440	0.591	0.480	0.487	0.603	0.511	0.509	0.902
Observations		*21,372*			*6,265*			*7,841*			*7,329*	

Notes: Columns show means at the pooled level and by sites at baseline across the treated and control groups. P-values (1-3) refer to t-tests performed across the treated and control groups at baseline.

Annex 3.5: First-stage regression results

	Outpatient Uptake†		Inpatient Uptake¥	
	Marginal effects	**Standard error**	**Marginal effects**	**Standard error**
Female children 0-13	0.007	0.005	0.003	0.005
Female older than 55 years	0.003	0.005	-0.001	0.005
Male aged 0-13 years	0.007	0.005	0.003	0.005
Male aged 14-55 years	0.012**	0.006	0.007	0.005
Male older than 55 years	0.013*	0.007	0.006	0.007
Household size	-0.001	0.001	-0.001	0.001
Female headed household	-0.007	0.006	-0.006	0.006
Household belongs to a scheduled tribe/caste	0.018	0.012	0.023	0.014
Primary education	-0.007**	0.003	-0.006*	0.003
Secondary education	-0.004	0.004	-0.005	0.005
Higher secondary education	-0.004	0.007	-0.006	0.007
Self-employed in non-agriculture	-0.017	0.01	-0.021*	0.011
Other employment	-0.001	0.012	-0.002	0.012
Casual wage labourer	-0.003	0.006	-0.004	0.006
Not working	0.000	0.005	-0.002	0.005
Doing housework	0.006	0.008	0.003	0.008
Student	0.004	0.004	0.003	0.004
Expenditure tertile: Low	-0.003	0.01	-0.005	0.011
Expenditure tertile: High	-0.003	0.008	0.000	0.008
Offer	0.336***	0.039	0.324***	0.032
Observations	*58,099*		*38,045*	

Notes: * p<0.1; ** p<0.05; *** p<0.01. In addition to the variables displayed in the table, both models include village level fixed effects and time effects. For outpatient care uptake the sample consists of observations from all three sites. For inpatient care uptake the sample consists of observations only from Kanpur Dehat and Pratapgarh.

Annex 4.1: Summary statistics of control variables in 2010

Definition	Households with RSBY membership	Households without RSBY membership	Test: RSBY HH=Non-RSBY HH	Test: RSBY HH=Non-RSBY HH	Test: RSBY HH=Non-RSBY HH
	Pooled Data			Uttar Pradesh	Bihar
			P-value (1)	P-value (2)	P-value (3)
Insurance					
Client of CBHI (1/0)	0.00	0.00	1.000	1.000	1.000
Insurance awareness index (ranging from 0 to 1)	0.00	0.00	1.000	1.000	1.000
Demographics					
female headed household (1/0)	0.24	0.23	0.444	0.399	0.456
household size	5.76	5.81	0.539	0.162	0.062
Female 0-13 years (1/0)	0.18	0.16	0.000	0.681	0.214
Female 14-55 years (1/0)	0.29	0.31	0.006	0.972	0.016
Female 55 year+ (1/0)	0.05	0.05	0.057	0.035	0.060
Male 0-13 years (1/0)	0.19	0.19	0.729	0.004	0.759
Male 14-55 years (1/0)	0.25	0.26	0.009	0.521	0.431
Male 55 year+ (1/0)	0.04	0.04	0.941	0.810	0.859
Socioeconomics					
no education (1/0)	0.45	0.38	0.000	0.707	0.030
primary education (1/0)	0.16	0.15	0.622	0.539	0.927
secondary education (1/0)	0.31	0.35	0.016	0.714	0.786
higher secondary education (1/0)	0.08	0.12	0.000	0.487	0.000
Lowest asset tertile (1/0)	0.43	0.35	0.000	0.535	0.008
Middle asset tertile (1/0)	0.34	0.33	0.611	0.345	0.210
Highest asset tertile (1/0)	0.23	0.32	0.000	0.108	0.000

Annex 4.1: *(Continued)*

Definition	Households with RSBY membership	Households without RSBY membership	Test: RSBY HH=Non-RSBY HH	Test: RSBY HH=Non-RSBY HH	Test: RSBY HH=Non-RSBY HH
	Pooled Data			Uttar Pradesh	Bihar
			P-value (1)	P-value (2)	P-value (3)
Socioeconomics *(Continued)*					
household belongs to a scheduled tribe/caste (1/0)	0.40	0.29	0.000	0.000	0.000
self-employed (1/0)	0.43	0.48	0.011	0.605	0.383
other employment (1/0)	0.04	0.08	0.000	0.073	0.049
casual wage labourer (1/0)	0.32	0.24	0.000	0.316	0.003
not working (1/0)	0.05	0.06	0.030	0.907	0.255
doing housework (1/0)	0.16	0.14	0.105	0.640	0.338
Location					
Bihar	0.54	0.27			
UP	0.46	0.73			

Notes: Table shows summary statistics across RSBY and non-RSBY households in 2010. P-values 1 through 3 refer to results derived from t-tests comparing values from the enrolled and non-enrolled at the pooled level and by sites.

Annex 4.2: Summary statistics of outcome variables for pooled sample in 2012 and 2013

Definition	Households with RSBY membership	Households without RSBY membership	Test: RSBY HH=Non-RSBY HH	Households with RSBY membership	Households without RSBY membership	Test: RSBY HH=Non-RSBY HH
	2012			2013		
			P-value			P-value
Proportion of household members with chronic illnesses	0.255	0.233	0.014	0.266	0.256	0.243
Any hospitalizations in the household (1/0)	0.138	0.126	0.342	0.144	0.127	0.162
Probability of incurring expenses due to hospitalization(1/0)	0.944	0.968	0.230	0.963	0.931	0.132
Direct hospitalization expenses (INR)	16876	19912	0.518	16452	17927	0.633
Standard Deviation	(42289)	(32221)		(23004)	(40736)	
Average distance to facility (km)	29	36	0.000	34	39	0.000
Standard Deviation	(24)	(17)		(25)	(24)	
Household with debt due hospitalization (1/0)	0.720	0.788	0.120	0.805	0.757	0.227
Debt amount (INR)	10238	11918	0.431	13072	13233	0.933
Standard Deviation	(16704)	(35372)		(19854)	(20443)	

Notes: Table shows summary statistics across RSBY and non-RSBY households in 2012 and 2013. P-values refers to t-tests comparing means of the enrolled and non-enrolled of the pooled sample.

Annex 4.3: Summary statistics of control variables for the pooled sample in 2012 and 2013

Definition	Households with RSBY membership	Households without RSBY membership	Test: RSBY HH=Non-RSBY HH	Households with RSBY membership	Households without RSBY membership	Test: RSBY HH=Non-RSBY HH
	2012			2013		
			P-value			P-value
Insurance						
Client of CBHI (1/0)	0.343	0.300	0.014	0.331	0.254	0.000
Insurance awareness index (ranging from 0 to 1)	0.495	0.497	0.765	0.536	0.526	0.090
Demographics						
female headed household (1/0)	0.313	0.302	0.547	0.294	0.300	0.744
household size	5.498	5.565	0.440	5.549	5.542	0.933
Female 0-13 years (1/0)	0.121	0.104	0.002	0.182	0.180	0.716
Female 14-55 years (1/0)	0.358	0.357	0.877	0.297	0.300	0.571
Female 55 year+ (1/0)	0.057	0.065	0.124	0.046	0.056	0.040
Male 0-13 years (1/0)	0.130	0.128	0.698	0.207	0.200	0.267
Male 14-55 years (1/0)	0.285	0.293	0.249	0.227	0.222	0.343
Male 55 year+ (1/0)	0.049	0.053	0.400	0.040	0.042	0.590
Socioeconomics						
no education (1/0)	0.493	0.412	0.000	0.473	0.396	0.000
primary education (1/0)	0.153	0.153	0.984	0.137	0.160	0.070
secondary education (1/0)	0.271	0.325	0.002	0.303	0.323	0.214
higher secondary education (1/0)	0.083	0.111	0.014	0.086	0.121	0.001
Lowest asset tertile (1/0)	0.401	0.326	0.000	0.312	0.226	0.000
Middle asset tertile (1/0)	0.349	0.339	0.547	0.344	0.307	0.025

Annex 4.3: *(Continued)*

Definition	Households with RSBY membership	Households without RSBY membership	Test: RSBY HH=Non-RSBY HH	Households with RSBY membership	Households without RSBY membership	Test: RSBY HH=Non-RSBY HH
	2012			2013		
			P-value			P-value
Socioeconomics *(Continued)*						
Highest asset tertile (1/0)	0.250	0.336	0.000	0.345	0.467	0.000
household belongs to a scheduled tribe/caste (1/0)	0.353	0.316	0.033	0.362	0.290	0.000
self-employed (1/0)	0.381	0.449	0.000	0.436	0.442	0.732
other employment (1/0)	0.064	0.088	0.017	0.048	0.055	0.409
casual wage labourer (1/0)	0.357	0.237	0.000	0.266	0.236	0.047
not working (1/0)	0.046	0.060	0.110	0.069	0.079	0.246
doing housework (1/0)	0.152	0.167	0.296	0.181	0.188	0.592
Location						
Bihar	0.585	0.283	0.000	0.479	0.238	0.000
UP	0.415	0.717	0.000	0.521	0.762	0.000

Notes: Table shows summary statistics across RSBY and non-RSBY households in 2012 and 2013. P-value refers to results derived from t-tests comparing values from the enrolled and non-enrolled at the pooled level.

Annex 4.4: Determinants of RSBY membership in 2012 and 2013

Variables	Pooled		Uttar Pradesh		Bihar	
	Marginal effects	Standard error	Marginal effects	Standard error	Marginal effects	Standard error
Proportion of household members with chronic illnesses (percent of household)	0.046*	0.041	0.032*	0.051	0.055	0.068
Log of average Distance from facility	0.024	0.024	0.080	0.052	0.006	0.029
Low insurance index score(1/0)	-0.061	0.045	-0.076	0.054	-0.036	0.079
High insurance index score (1/0)	0.021	0.016	0.024	0.019	0.012	0.027
Enrolled in CBHI(1/0)	0.019*	0.023	0.050*	0.028	-0.026	0.038
Lowest asset tertile (1/0)	-0.03	0.022	-0.025	0.028	-0.032	0.036
Highest asset tertile (1/0)	0.013	0.022	0.007	0.026	0.022	0.040
Primary education (1/0)	-0.030	0.032	-0.019	0.042	-0.054*	0.050
Secondary education (1/0)	-0.005**	0.036	0.013	0.046	-0.027	0.059
Higher secondary education (1/0)	0.054	0.058	0.091	0.071	0.001	0.105
Other employment (1/0)	-0.010	0.038	0.044	0.047	-0.097	0.067
Casual wage labourer (1/0)	-0.009	0.023	0.008	0.029	-0.035	0.038
Not working (1/0)	0.006	0.037	0.017	0.044	-0.011	0.071
Doing housework (1/0)	-0.020	0.029	-0.002	0.036	-0.053	0.049
Female headed household (1/0)	0.023	0.036	0.093*	0.048	-0.053	0.057
Household size	0.023***	0.007	0.028***	0.009	0.020	0.014
Female 0 to 13yrs (1/0)	0.006	0.087	-0.053	0.110	0.083	0.144
Female older than 55 (1/0)	-0.279***	0.107	-0.262**	0.126	-0.374*	0.214
Male 0 to 13yrs (1/0)	-0.212*	0.115	-0.184	0.142	-0.306	0.197
Male 14 to 55yrs (1/0)	-0.139	0.095	-0.038	0.117	-0.337**	0.169
Male older than 55 (1/0)	-0.064	0.147	-0.054	0.182	-0.065	0.253
Year: 2013	0.178***	0.038	0.176***	0.045	0.186***	0.070
Observations	*6,367*		*4,085*		*2,282*	

Notes: Table shows marginal effects of OLS models using household level fixed effects. The binary dependent variable shows whether a household is enrolled in RSBY. Data is pooled across the three survey years. *, **, *** indicate significance at the 10%, 5% and 1% respectively.

Annex 4.5: Effects of RSBY

	Pooled		UP		Bihar	
	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
Probability of hospitalizations (1/0)	0.000	(0.013)	-0.011	(0.017)	0.014	(0.020)
Observations	*6,755*		*3,973*		*2,782*	
Probability of having healthcare expenses conditional on use (1/0)	0.014	(0.039)	-0.007	(0.078)	0.043	(0.045)
Observations	*897*		*476*		*421*	
Log of healthcare expenses conditional on spending (INR)	-0.278	(0.195)	0.577	(0.438)	-0.675***	(0.234)
Observations	*858*		*455*		*403*	
Probability of debt conditional on use (1/0)	0.047	(0.074)	-0.013	(0.115)	0.174	(0.100)
Observations	*897*		*476*		*421*	
Log of the amount of debt conditional on borrowing (INR)	-0.166	(0.269)	0.347	(0.572)	-0.611***	(0.277)
Observations	*740*		*385*		*355*	

Notes: Table shows coefficients of OLS models using household level fixed effects. Association between RSBY membership and inpatient utilization/financial protection identified for the bottom two-third of the households. Logged forms of healthcare expenses and the amount of debt are used in the respective models. *, **, *** indicate significance at the 10%, 5% and 1% respectively.

Annex 5.1: Baseline summary of outcome variables for children under-5 years

	Ultra-poor households			Other-poor households		
	Treated areas	Control areas	Normalized differences	Treated areas	Control areas	Normalized differences
	1	2	3	4	5	6
Panel A: 0 to 5 years						
Weight for height z-score (WHZ)	-1.20	-1.25	0.05	-1.17	-1.13	-0.03
Wasting (WHZ<-2SD) (1/0)	0.20	0.23	-0.07	0.21	0.18	0.06
Height for age z-score (HAZ)	-2.01	-2.02	0.01	-1.92	-1.95	0.03
Stunting (HAZ<-2SD) (1/0)	0.51	0.52	-0.01	0.48	0.50	-0.04
Weight for age z-score (WAZ)	-1.98	-2.02	0.04	-1.92	-1.89	-0.03
Underweight (WAZ<-2SD) (1/0)	0.48	0.50	-0.04	0.47	0.46	0.01
Observations	*1,900*	*1,075*		*2,700*	*2,998*	

Notes: Table shows baseline (2007) means of outcome variables. Columns 1 and 2 show means across treated and control areas for ultra-poor households. Columns 4 and 5 show outcome means across treated and control areas among other-poor households. Columns 4 and 6 present normalized differences between the respective groups, calculated as the difference in means in treatment and control areas, divided by the squared root of the sum of their variances.

Annex 5.2: Baseline summary of intermediary variables

	Ultra-poor households			Other-poor households		
	Treated areas	Control areas	Normalized differences	Treated areas	Control areas	Normalized differences
	1	2	4	5	6	8
Breastfeeding and vitamin A supplements [¥]						
Probability of breastfeeding (1/0)	0.97	0.97	0.02	0.98	0.97	0.04
Duration of exclusive breastfeeding (days)	103	94	0.10	105	99	0.08
Administration of Vitamin A (1/0)	0.28	0.34	0.13	0.38	0.34	0.09
Observations	*1,032*	*548*		*1,541*	*1,774*	
Illnesses [¥]						
Likelihood of contracting an infectious disease (children) (1/0)	0.03	0.03	0.01	0.03	0.03	0.02
Observations	*4,071*	*2,551*		*5,194*	*6,044*	
Likelihood of falling ill (adults) (1/0)	0.278	0.29	0.030	0.254	0.261	0.017
Observations	*14,624*	*8,783*		*20,448*	*23,127*	
Food security [†]						
Members can generally manage two meals a day (1/0)	0.467	0.364	0.220	0.657	0.566	0.180
Observations	*4,440*	*2,875*		*5,382*	*6,227*	
Safe water and hygiene practices [†]						
Use of sanitary toilet (1/0)	0.55	0.47	0.17	0.65	0.60	0.11
Safe drinking water (1/0)	0.99	0.99	0.07	0.98	0.99	0.09
Observations	*4,440*	*2,875*		*5,382*	*6,227*	

Notes: Table shows baseline (2007) means of intermediary variables. Columns 1 and 2 show means across treated and control areas for ultra-poor households. Columns 4 and 5 show outcome means across treated and control areas among other-poor households. Columns 4 and 6 present normalized differences between the respective groups, calculated as the difference in means in treatment and control areas, divided by the squared root of the sum of their variances. Normalized differences greater than 0.25 indicates statistically different means. [¥] Analysis conducted at the individual level. [†] Analysis conducted at the household level.

Annex 5.3: End-line summary of outcomes

	Ultra-poor			Other Poor		
	Treated areas	Control areas	Normalized differences	Treated areas	Control areas	Normalized differences
	1	2	3	4	5	6
Panel B: 6 to 19 years						
Body mass index (BMI in SD)	-0.90	-1.27	35.00	-1.06	-1.23	16.30
Thinness (BMI< -2SD) (1/0)	0.13	0.23	-25.40	0.17	0.22	-12.70
Height for age (HAZ)	-1.81	-1.85	3.30	-1.69	-1.67	-1.60
Stunting (HAZ<-2SD) (1/0)	0.44	0.47	-4.20	0.40	0.40	0.60
Weight for age (WAZ)	-1.73	-2.15	38.50	-1.84	-1.98	12.50
Underweight (WAZ<-2SD) (1/0)	0.39	0.58	-38.90	0.43	0.49	-10.70
Observations	*3,220*	*2,016*		*4,853*	*5,330*	
Panel C: 19 years +						
Body mass index (absolute value)	19.51	19.04	17.20	19.91	19.69	7.80
Moderate thinness (BMI<18.5)	0.38	0.47	-17.40	0.33	0.36	-6.00
Severe thinness (BMI<17)	0.15	0.22	-17.50	0.12	0.14	-6.50
Observations	*5,806*	*3,693*		*7,835*	*8,947*	

Notes: Table shows end-line (2011) means of outcome variables. Columns 1 and 2 show means across treated and control areas for ultra-poor households. Columns 4 and 5 show outcome means across treated and control areas among other-poor households. Columns 4 and 6 present normalized differences between the respective groups, calculated as the difference in means in treatment and control areas, divided by the squared root of the sum of their variances.

Annex 5.4: Baseline summary of control variables

	Ultra-poor households			Other-poor households		
	Treated areas	Control areas	Normalized differences	Treated areas	Control areas	Normalized differences
	1	2	3	4	5	6
Demographics						
Female headed household (1/0)	0.23	0.32	-0.19	0.08	0.09	-0.02
Household size	4.15	4.07	0.07	4.52	4.46	0.03
Socioeconomics						
Per capita income (BDT)	5170	6477	-0.13	3256	3765	-0.05
Standard deviation						
Education of household head:						
No education (1/0)	0.73	0.77	-0.09	0.60	0.60	0.00
Primary education (1/0)	0.22	0.18	0.09	0.29	0.28	0.01
Secondary education (1/0)	0.04	0.03	0.02	0.09	0.09	-0.01
Tertiary education (1/0)	0.01	0.01	-0.01	0.03	0.04	-0.03
Employment of household head:						
Household work (1/0)	0.12	0.14	-0.06	0.04	0.06	-0.06
Casual day labourer (1/0)	0.46	0.30	0.34	0.64	0.59	0.10
Agricultural worker (1/0)	0.37	0.48	-0.24	0.26	0.29	-0.08
Semi-skilled worker (1/0)	0.03	0.04	-0.06	0.04	0.04	0.02
Other employment (1/0)	0.03	0.04	-0.09	0.02	0.03	0.03
Asset						
Owns any land (1/0)	0.08	0.07	0.02	0.21	0.18	0.05
Owns any livestock (1/0)	0.53	0.50	0.06	0.71	0.70	0.00
Has any savings (1/0)	0.38	0.36	0.06	0.58	0.58	0.02
Observations	*14,624*	*8,793*		*20,448*	*23,127*	

Notes: Table shows baseline (2007) means of control variables. Columns 1 and 2 show means across treated and control areas for ultra-poor households. Columns 4 and 5 show outcome means across treated and control areas among other-poor households. Columns 4 and 6 present normalized differences between the respective groups, calculated as the difference in means in treatment and control areas, divided by the squared root of the sum of their variances. Normalized differences greater than 0.25 indicates statistically different means.

Annex 5.5: Determinants of attrition

	Ultra-poor Households		Other-poor Households	
	Marginal effects	**Standard errors**	**Marginal effects**	**Standard errors**
Ultra-poor households (1/0)	0.009	0.017		
Other-poor households (1/0)			0.005	0.017
Nutrition indicators				
Height (in cm)	0.000	0.000	0.000	0.000
Weight (in kg)	0.000	0.000	0.000	0.000
Age (in months)	-0.001	0.000	0.000	0.000
Demographics				
Female headed household (1/0)	0.011	0.012	0.021	0.015
Household size	-0.005	0.003	0.000	0.002
Socioeconomics				
Per capita income (BDT)	0.000	0.000	0.000	0.000
Education of household head:				
Primary education (1/0)	-0.022	0.014	-0.030***	0.010
Secondary education (1/0)	0.003	0.028	0.013	0.013
Tertiary education (1/0)	-0.083	0.044	0.013	0.020
Employment of household head:				
Casual day labourer (1/0)	-0.053	0.017	-0.034	0.019
Agricultural worker (1/0)	-0.067***	0.017	-0.088	0.016
Semi-skilled worker (1/0)	-0.080**	0.028	-0.068**	0.025
Other employment (1/0)	0.000	0.024	-0.026	0.012
Asset				
Owns any land (1/0)	-0.012	0.010	-0.006	0.008
Owns any livestock (1/0)	-0.012	0.011	-0.011	0.012
Observations	*20,357*		*37,192*	

Notes: Table shows marginal effects of a probit model. The dependent variable, attrition, is equal to 1 if the individual is not observed in 2011 and 0 otherwise. The models are analysed using village level fixed effects and the standard errors are clustered at the branch level. The null hypothesis of whether the covariates and attrition vary across the treatment status was not rejected.

Annex 5.6: Spill-over effects of CFPR on nutritional status of non-poor households

	Marginal Effects	Standard errors
Panel A: 0 to 5 years		
Weight for height (WHZ)	-0.081	0.089
Wasting (WHZ<-2SD) (1/0)	0.046	0.028
Height for age (HAZ)	0.098	0.137
Stunting (HAZ<-2SD) (1/0)	-0.050	0.045
Weight for age (WAZ)	0.039	0.090
Underweight (WAZ<-2SD) (1/0)	-0.017	0.044
Observations	*3,124*	
Panel B: 6 to 19 years		
Body mass index (BMI in SD)	-0.017	0.066
Thinness (BMI< -2SD) (1/0)	0.029	0.021
Height for age (HAZ)	-0.063	0.081
Stunting (HAZ<-2SD) (1/0)	-0.002	0.029
Weight for age (WAZ)	0.002	0.119
Underweight (WAZ<-2SD) (1/0)	-0.000	0.072
Observations	*4,625*	
Panel C: 19 years +		
Body mass index (absolute value)	-0.009	0.075
Moderate thinness (BMI<18.5)	0.003	0.012
Severe thinness (BMI<17)	0.002	0.007
Observations	*20,489*	

Notes: Table shows marginal effects of OLS models using village level fixed effects. For ages 0 through 19, effect on the continuous z-scores should be interpreted in terms of standard deviations from the median of the WHO international reference group. Results for the group 20+ years show absolute values of BMI and binary outcomes (BMI<18.5 and BMI<17.5) indicating moderate and severe thinness. Errors are calculated using the delta method and clustered at the branch level. Critical values at which the null hypothesis is rejected is adjusted down using the Bonferroni correction. ***, **, * indicate significance at 10%, 5% and 1% per cent respectively. Bold indicates significant difference between male and female headed households; and between male and female respondents at the 10% level.

Annex 5.7: Comparison of impact between infants (0-24 months) and toddlers (26-60 months)

	Ultra-poor households				Other-poor households			
	0-24 months		25-60 months		0-24 months		25-60 months	
Variables	Marginal effects	Standard errors	Marginal effects	Standard errors	Marginal effects	Standard errors	Marginal effects	Standard errors
Weight for height (WHZ)	**1.750*** **	0.132	**1.024*** **	0.096	**0.803*** **	0.653	**0.411*** **	0.108
Wasting (WHZ<-2SD) (1/0)	-0.140***	0.033	-0.110***	0.023	-0.058	0.142	-0.084**	0.027
Height for age (HAZ)	0.422	0.879	0.187	0.153	0.979	1.281	0.216	0.140
Stunting (HAZ<-2SD) (1/0)	0.274	0.313	-0.074	0.052	0.129	0.220	-0.053	0.036
Weight for age (WAZ)	**1.497*** **	0.430	**0.746*** **	0.081	**1.003** **	0.316	**0.336*** **	0.065
Underweight (WAZ<-2SD) (1/0)	-0.330***	0.058	-0.304***	0.041	**-0.326*** **	0.040	**-0.122*** **	0.026
Observations	*840*		*2,744*		*1,760*		*5,270*	

Notes: Table shows marginal effects of OLS models using village level fixed effects. Effects on the continuous z-scores should be interpreted in terms of standard deviations from the median of the WHO international reference group. Bold indicates significant difference between the two age groups at the 10% level. Errors are calculated using the delta method and clustered at the branch level. Critical values at which the null hypothesis is rejected is adjusted down using the Bonferroni correction. *, **, *** indicate significance at the 10%, 5% and 1% respectively. Bold indicates significant difference between male and female headed households; and between male and female respondents at the 10% level.

Annex 6.1: Challenging the frontiers of poverty reduction (programme background and description)
The CFPR programme is/has been especially designed to meet the needs of the ultra-poor households who are too poor to access or adequately use the conventional development interventions such as microfinance. Main objective of the CFPR is to strengthen the livelihoods of the ultra-poor through asset transfer, enterprise development training, special health services, social capital development services and subsistence allowance.

6.1.1 Selection process

The selection process is the key to the success of the programme as the costs of leakages are extremely high. The selection process of the beneficiaries of the CFPR takes place as part of a three-stage process. Initially, based on the poverty mapping conducted by the World Food Programme, the poorest districts and subdistricts are identified. Based on experience from other BRAC programmes in those localities, further geographical selection is carried out within each sub-district, which helps the CFPR team to identify the poorest sections of the locality. The second stage involves a community wealth-ranking exercise to identify the ultra-poor within the community itself known as the Participatory Rural Appraisal, developed by Robert Chambers (1994). A particular emphasis is placed on capturing the 'invisible' households; that is, those households that do not show up on different surveys including the preliminary household identification process. In the wealth-ranking exercise, households are clustered into several groups and the bottom two groups (often bottom group) of wealth ranks are then surveyed by a small questionnaire to check their eligibility against five inclusion and three exclusion criteria.[93] In fact, a study found that almost 3 per cent of the finally selected households for the CFPR were from the 'invisible' households (Sulaiman 2009).[94] A targeting effectiveness study CFPR using a poverty index created by the Consultative Group to Assist the Poor showed that more than 80 per cent of those selected fell within the bottom two deciles of the index (Sulaiman and Matin 2008).

6.1.2 Training and assets transfer

The Enterprise Development Training is designed keeping in mind that the members are able to develop transferable skills that they can maximise while managing any form ofincome-generating enterprises that BRAC provides (Raza 2008). There are nine options among which the choices must be made through discussion by the member and the field staff.[95] The training mainly falls into two parts; that is, in-class and hands-on training. The in-class training lasts from three to six days, contingent on the

[93] The five inclusion criteria for the CFPR programme include: (i) the household owns less than 10 decimals of land; (ii) the household is dependent upon female domestic work or begging; (iii) no male adult active members in the household; (iv) children of school going age have to take paid work; and (v) no productive assets in the household. Three exclusion criteria were used: (i) household does not have an active female member; (ii) any of the household members is participating microfinance; and (iii) household is enjoying any intervention from other development programmes.

[94] There are a number of reasons that contribute to these households being invisible. Firstly, these household members sometimes reside in other households' backyards. Although the community may assume them to be part of the resident household, for all practical purposes they have an independent 'economy'. Secondly, for those who are floaters with no specified place to sleep at night, the community does not usually consider them to be a household at all. And because these two groups do not qualify as households in surveys, they become excluded from a myriad of interventions de facto.

[95] Goat-rearing, cow-rearing, livestock (a combination of cow-rearing and goat-rearing), Black Bengal goat-rearing (special farm), cow and poultry combination, vegetable cultivation, horticulture nursery, non-farm activities and lastly poultry for egg production.

type of enterprise assets the members receive. As a part of the compensation package, they receive food and transportation costs. Following the initial training period is when they receive their assets along with corrugated roofs to house their cows and or goats and a free cage for the birds.

6.1.3 Subsistence allowance

A weekly stipend was also provided to the CFPR participants in an effort to create a holistic support package for the extreme poor of approximately BDT 70 (US$1.00). The reason why the CFPR provides this allowance is to help smooth consumption during the time beneficiaries spend taking care of the assets provided by the programme as opposed to earning income. Additionally, providing a subsistence allowance also acts as a deterrent against selling the IGAs for meeting immediate consumption needs. This stipend is provided to them for eight to 12 months depending on the type of IGA (income-generating assets) they have received; that is, until the assets begin to yield an income.

6.1.4 Health support

BRAC's healthcare programme aims to realise sustained health impacts by reducing maternal, infant and child mortality and fertility, and by improving health and nutrition in children, adolescents and women. The CFPR accomplishes these goals through two sets of strategies. The first strategy incorporates education and information dissemination. The programme staff educate individuals and communities about important healthcare and nutritional issues. The second strategy comprises the provision of healthcare services. The CFPR offers reproductive and family planning services; pregnancy and basic curative care; and treatment of tuberculosis. Furthermore, also as a core part of the programme, hygiene related items such as sanitary latrines and tube-wells are supplied, the uses of which are strongly encouraged.

6.1.5 Social development

To effectively address the holistic approach of the CFPR, the Social Development Programme (SDP) aims to build and secure the human and socio-political asset base of the rural poor, especially of women, as well as to enable them to improve their well-being, reduce vulnerabilities, take advantage of new opportunities, exercise their rights and play a more active role in public life. One of the avenues through which the SDP tries to accomplish their targets is through building rural institutions to ensure stronger accountability of the local government to the poor, especially to women. One important component of the SDP is the Gram Daridro Bimochon Committee [Village Poverty Reduction Committee]. This committee re-invents the use of the services of the rural elite to support the beneficiaries of the programme. Although discarded in the early 1970s, the idea of using the local elites to ensure the success of the beneficiaries by acting as social protection agents was reintroduced as a part of the CFPR to assist the beneficiaries with issues such as providing social security for the participant members among a myriad of other things.[96]

[96] They also assist them in resolving their problems and taking necessary actions against exploitation or oppression, providing assistance with financing or accessing medical care as necessary, encouraging and facilitating the school admission and attendance of ultra-poor children and helping the participant members address households' water and sanitation problems by assisting with installing tube wells and latrines.

Access to information on the rights and entitlements of the poor is essential for building confidence, gaining greater control over their lives and ensuring accountability of local government services and resources. This target is met through the use of popular theatre to disseminate information to the communities through entertainment.

6.1.6 Human rights and legal services

One of the important components of the Human Rights and Legal Services includes legal aid classes to boost awareness on topics such as constitutional laws, family and inheritance laws for Hindus and Muslims to empower the poor and marginalised through community mobilisation and capacity-building. Additionally the Human Rights and Legal Services also works to provide support to the CFPR beneficiaries through assistance in conflict resolution, legal representation and also to compel the legal system to reduce violence against women and children.

6.1.7 Graduation

After 24 months of the programme, the participants begin preparing for their graduation from the programme through confidence-building training. Their initial dependence on the CFPR staff is methodically weaned off as they move towards their graduation. At the 24th month mark, the participants are considered graduates as they have by then completed the requisite training and have enough of an asset base to move up the poverty ladder. At this juncture, several benchmarks are expected to be met. These benchmarks include intangible assets such as more confidence in their own abilities to make a sustainable living for themselves with a higher capital base that would translate into higher income and greater food security. Side by side, it is expected that they will also be able to afford at least basic health services, have access to clean drinking water and better sanitation, and also be better educated and more aware in their social surroundings for both the participant women and their children in terms of their rights. Eventually, it is hoped that all these factors in combination will lead to economically and ultimately socially empowered women.

6.1.8 Costs

The cost per beneficiary comes to approximately US$292 for the duration of two years, during which the programme participants receive income-generating assets and background support services as described previously. Additionally, the costs of administration for such a thorough programme are immense due to the high level of involvement by the programme staff. One of the components here is to understand that although it is said that the US$292 is per participant, it is in fact for the entire household that is being reached. What this means is that the assets, both social and capital, are provided for the entire household, who reaps the benefits provided from components such as social protection, health benefits for the mother and children and education. However, the comprehensive package was found to be highly cost-effective, having a benefit-cost ratio at 5.07 (Sinha et al. 2008).[97]

[97] This information was collected during an interview with Ms Rabeya Yasmin, Associate Director, CFPR Programme, BRAC for the purposes of this paper.

Annex 6.2: Baseline comparison between attrition and non-attrition households

	Attrition (during 2002-08)	Available HH in 2008	Difference
Has cash savings (% of respondent women)	13.20	14.50	-1.3
Roof made house (% of HHs)	34.91	37.26	-2.35
Use sanitary latrine (% of HHs)	3.99	3.32	0.67
Present value of the living room (BDT) (mean)	1184.07	1216.92	-32.85
Face always food deficit (%)	58.22	51.46	6.76***
Mean cultivable land (acre)	1.72	1.68	0.041
Own cow (% of HHs)	5.20	6.81	-1.62*
Own poultry (% of HHs)	35.10	39.48	-4.38***
Household size (mean)	3.21	3.78	-0.57
Age of the household head (mean)	44.00	43.03	0.97***
Female headed households (%)	44.85	32.42	12.42***
Years of education of the household head	0.49	0.53	-0.04
Observations	*1,077*	*4,549*	

Note: *, **, *** indicate significance at the 10%, 5% and 1% respectively.

Annex 6.3: Baseline (2002) value of the outcome variables of interest

Outcome variables (mean)	Participants	Non-participants	Difference
No. of Cow/bull	0.04	0.19	-0.14***
No. of goat/sheep	0.10	0.13	-0.03**
No. of duck/hen	0.85	1.44	-0.59***
Per capita income (Tk.)	2493	2785	-291.83***
Own cultivable land (decimals)	0.71	2.23	-1.52***
Homestead land (decimals)	2.27	2.98	-0.70***
Mortgaged-in/rented -in land (decimal)	2.00	3.61	-1.61***
No. of Radios	0.01	0.02	-0.01***
No. of Big trees	0.56	1.29	-0.74***
No. of beds	0.76	1.01	-0.25***
No. of Rickshaw/van	0.02	0.05	-0.03***
Market value of the house (Tk.)	864.2	1562.4	-698.2***
Formal outstanding loan (Tk.)	22.5	472.0	-449.5***
Informal outstanding loan (Tk.)	272.9	495.8	-222.9***
Per capita calorie intake (Kcal)	1730	1818	-87.70
Per capita food expenditure (Tk.)	8.58	9.07	-0.49

Note: *, **, *** indicate significance at the 10%, 5% and 1% respectively.

Annex 6.4: Difference between participant and non-participant of the variables used for propensity score matching, 2002

	Control	Treatment	Difference
Female Headed household (%)	25.1	39.9	-14.8***
Household Size (mean)	3.905	3.655	0.249***
Owned tube-well (%)	3.74	1.64	2.09***
Own land (in decimals) (mean)	6.143	2.367	3.776***
Received govt. benefit (%)	17.36	18.7	-1.33
Has outstanding loan from NGO (%)	10.4	0.6	9.7***
Main occupation of the main female member of the household is housemaid or begging (%)	11.6	18.97	-7.35***
No. of active female member (mean)	2.001	1.972	0.0288
No. of active male member (mean)	0.9334	0.7307	0.2026***
Owned cow/bull (%)	0.1053	0.0306	0.0746***
Owned goat/sheep (%)	9.31	6.13	3.18***
Owned duck/hen (%)	46.17	32.65	3.51***
Owned rickshaw/van (%)	3.87	1.37	2.4***
Owned radio/TV (%)	2.00	0.80	1.2***
Owned ornaments (%)	0.91	0.71	0.20
Owned shop (%)	0.26	0.09	0.172
Main house' roof made of straw (%)	32.89	41.71	-8.81***
Helped by non-relative neighbour (%)	14.9	16.4	1.5
Average schooling of the household members (years) (mean)	1.0146	0.6585	0.3560***
Maximum years of schooling in the households (mean)	2.5422	1.705	0.8371***
Whether faced any crisis/incidence (%)	73.02	81.83	-08.81***
Faced chronic food deficit in last one year (%)	69.66	51.62	18.04***
Can take help from state law (%)	46.86	45.8	01.06
Improved economic status in the last one year (%)	13.2	12.4	0.7***

Note: *, **, *** indicate significance at the 10%, 5% and 1% respectively.

Annex 6.5: Determinants of participation, probit regression results (using full sample)

	Coefficient	z-value
Female Headed household (Yes=1, No=0)	0.302	5.46***
Household Size	0.091	4.15***
Owned tube-well (Yes=1, No=0)	-0.322	-2.42**
Own land (in decimals)	-0.019	-6.45***
Received govt. benefit (Yes=1, No=0)	0.104	1.99**
Has outstanding loan from NGO (Yes=1, No=0)	-1.429	-10.73***
Main occupation of the main female member of the household is housemaid or begging (Yes=1, No=0)	0.043	0.73
No. of active female member	0.006	0.23
No. of active male member	-0.181	-3.87***
Owned cow/bull (Yes=1, No=0)	-0.518	-5.77***
Owned goat/sheep (Yes=1, No=0)	-0.053	-0.68
Owned duck/hen (Yes=1, No=0)	-0.159	-3.75***
Owned rickshaw/van (Yes=1, No=0)	-0.337	-2.44**
Owned radio/TV (Yes=1, No=0)	-0.176	-0.96
Owned ornaments (Yes=1, No=0)	0.003	0.01
Owned shop (Yes=1, No=0)	-0.657	-1.16
Main house' roof made of straw (Yes=1, No=0)	0.178	4.32***
Helped by non-relative neighbour (Yes=1, No=0)	0.061	1.11
Average schooling of the household members (years)	0.008	0.2
Maximum years of schooling in the household (years)	-0.057	-2.82***
Whether faced any crisis/incidence (Yes=1, No=0)	0.182	3.7***
Faced chronic food deficit in last one year (Yes=1, No=0)	-0.338	-7.96***
Can take help from state law (Yes=1, No=0)	0.098	2.42**
Improved economic status in the last one year (Yes=1, No=0)	0.314	4.99
Constant	-0.089	-1.03
Observations	*4,549*	
Pseudo R-square	0.12	

Note: *, **, *** indicate significance at the 10%, 5% and 1% respectively.

Annex 6.6: Determinants of participation, probit regression results (used for food security analysis)

	Coefficient	z-value
Female Headed household (Yes=1, No=0)	0.289	1.42
Household Size	0.106	1.18
Owned tube-well (Yes=1, No=0)	-0.772	-1.11
Own land (in decimals)	-0.081	-2.72***
Received govt. benefit (yes=1, No=0)	0.172	0.92
Has outstanding loan from NGO (Yes=1, No=0)	-0.337	-0.44
Main occupation of the main female member of the household is housemaid or begging (Yes=1, No=0)	0.356	1.87*
No. of active female member	-0.124	-1.1
No. of active male member	-0.138	-0.86
Owned cow/bull (Yes=1, No=0)	-0.550	-0.97
Owned duck/hen (Yes=1, No=0)	-0.112	-0.47
Owned ornaments (Yes=1, No=0)	-0.558	-0.82
Main house' roof made of straw (Yes=1, No=0)	-0.140	-0.85
Average schooling in the households (years)	-0.228	-1.1
Maximum years of schooling in the households (years)	0.133	1.48
Faced chronic food deficit in last one year (Yes=1, No=0)	-0.242	-1.48
Can take help from state law (Yes=1, No=0)	-0.017	-0.1
Constant	0.133	0.43
Observations	*298*	
Pseudo R-square	0.07	

Note: *, **, *** indicate significance at the 10%, 5% and 1% respectively.

Annex 7.1: Determinants of attrition

Variables	Marginal effects	Standard Error
beneficiary	0.035	0.018
cowbull_a	-0.018***	0.006
goatsheep_a	-0.011*	0.006
duckhen_a	-0.002	0.002
bigtree_a	-0.005	0.004
csav	0.027	0.018
formaloan	-0.013	0.015
badloan	0.012	0.013
percapinc	0.000	0.000
entrepreneur	0.006	0.033
emp_begging_maid	0.018	0.038
emp_daylabourer	-0.04	0.032
owl_h	-0.030**	0.013
owl_c	-0.028	0.027
rickvan_a	0.026	0.023
rooftin	0.026	0.016
radiotv_a	-0.012	0.036
twicemeal	-0.015	0.017
egg	-0.006	0.007
invited	0.001	0.013

Notes: Results show marginal effects of a probit model. The dependent variable equals one for households that are not in the balanced panel , 0 otherwise. Covariates reflect baseline characteristics. *, **, *** indicate significance at the 10%, 5% and 1% respectively.

Annex 7.2: Effects of the CFPR program across different time periods using non-parametric DiD with matching

Variables	D1 (2005-2002)	D2 (2008-2002)	D3 (2011-2002)	D4 (2008-2005)	D5 (2011-2008)
	Directly affected outcomes				
Livestock and nursery					
cowbull_a	1.477***	0.940***	0.414***	-0.550***	-0.526***
goatsheep_a	0.405***	0.278***	0.01	-0.115***	-0.247***
duckhen_a	0.506***	1.634***	0.403***	1.111***	-1.231***
bigtree_a	0.014	0.25	0.097	0.236	-0.216
Financial Participation					
csav	0.625***	0.563***	0.398***	-0.065***	-0.161***
formalloan	0.303***	0.221***	0.125***	-0.093***	-0.089***
informalloan	-0.124**	-0.104*	-0.071***	-0.020***	-0.024**
	Indirectly affected outcomes				
Socioeconomic Status					
percapinc	826.51***	1493.63***	1163.73***	679.67***	-180.72
Occupation					
emp_entrepreneur	0.083***	0.177***	0.040**	0.098***	-0.137***
emp_begging_maid	-0.059***	-0.067***	-0.027**	-0.009	0.051***
emp_daylabourer	-0.035**	-0.107***	-0.022	-0.073***	0.074***
Asset holdings					
owl_h	0.050***	0.080***	0.075***	0.034*	0.0003
owl_c	0.007	0.036***	-0.008	0.033***	-0.039***
rickvan_a	0.028***	0.035***	-0.003	0.007	-0.032*
rooftin	0.063***	0.026**	0.019*	-0.040***	-0.007
radiotv_a	0.011*	0.018***	0.008	0.004	-0.008
Food Security					
twicemeal	0.137***	0.071***	0.002	-0.070***	-0.059***
egg	0.365***	0.326***	0.1768**	-0.038	-0.200***
Social Capital					
invited	0.0527**	0.086***	-0.016	-0.033	-0.097***

Notes: *, **, *** indicate significance at the 10%, 5% and 1% respectively.

Annex 7.3: Summary statistics of baseline characteristics across male and female headed households

Variable name	Description	2002		Difference
		Female Headed	Male Headed	
Socioeconomic Status				
percapinc	Annual per capita households income (BDT)	2354	2633	-321***
csav	Has cash savings (1/0)	0.103	0.164	0.061***
Occupation				
emp_service	salaried employment (1/0)	0.023	0.023	-0.001
emp_entrepreneur	entrepreneur (ag/non-ag) (1/0)	0.129	0.229	0.100***
emp_begging_maid	begging or working as maids (1/0)	0.325	0.036	-0.289***
emp_daylabourer	employed as day laborer (1/0)	0.409	0.647	0.238***
emp_other	employed in other categories (1/0)	0.048	0.01	-0.038***
Asset holdings				
owl_h	Owns any homestead land (1/0)	0.421	0.58	0.158***
owl_c	Owns any cultivable land (1/0)	0.035	0.053	0.018***
cowbull_a	Number of cow/bulls	0.045	0.143	0.098***
goatsheep_a	Number of goats/sheep	0.085	0.129	0.044***
duckhen_a	Number of poultry	0.833	1.287	0.454***
bigtree_a	Number of big trees	0.534	0.841	0.307**
rickvan_a	Owns any rickshaws or cycle vans (1/0)	0.006	0.028	-0.022***
radiotv_a	Owns any radios/TVs (1/0)	0.005	0.017	0.012***
rooftin	Roof of the house made of tin (1/0)	0.531	0.479	-0.052***
Financial Participation				
formalloan	Has formal loans from NGOs (1/0)	0.029	0.083	0.054***
informalloan	Has informal loans from money lenders(1/0)	0.361	0.317	-0.044*
Food Security				
twicemeal	Usually can have at least two meals a day (1/0)	0.537	0.631	0.094***
egg	Number of eggs consumed in the past week	0.44	0.643	0.202***
Social Capital				
invited	Invited to non-relatives' homes	0.217	0.293	0.076***

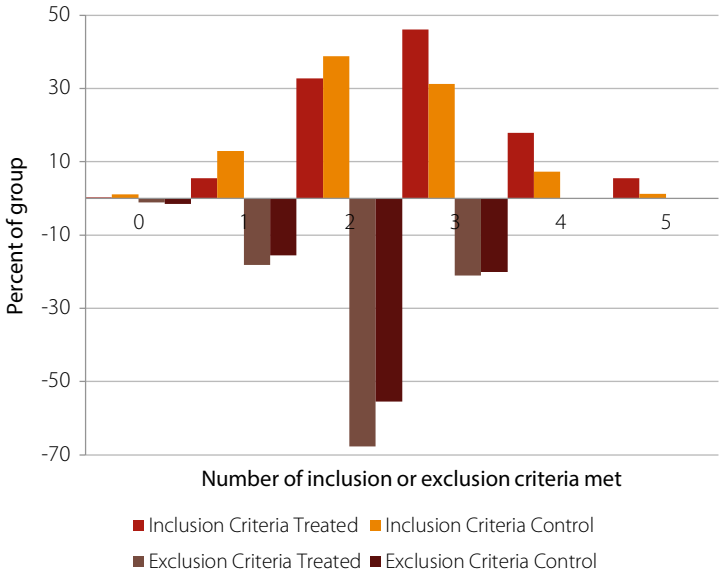
Notes: *, **, *** indicate significance at the 10%, 5% and 1% respectively from t-tests.

Annex 7.4: Effects of the CFPR program in the Rangpur District

Variables	D1 (2005-2002)	D2 (2008-2002)	D3 (2011-2002)	D4 (2008-2005)	D5 (2011-2008)
	Directly affected outcomes				
Livestock and nursery					
cowbull_a	1.309***	0.920***	0.413***	-0.383***	-0.492***
goatsheep_a	0.434***	0.427***	0.177**	-0.005	-0.243**
duckhen_a	0.502**	1.750***	0.465*	1.260***	-1.100***
bigtree_a	0.379**	0.519**	0.077	0.145	-0.395
Financial Participation					
csav	0.618***	0.671***	0.592***	0.054**	-0.060**
formalloan	0.378***	0.224***	0.107***	-0.155***	-0.105***
informalloan	-0.057	-0.032	-0.034	-0.090	-0.116
	Indirectly affected outcomes				
Socioeconomic Status					
percapinc	984.634***	1,717.551***	1,728.290***	748.770***	221.886
Occupation					
emp_entrepreneur	0.058**	0.134***	0.085**	0.075**	-0.040
emp_begging_maid	-0.054**	-0.067***	-0.054*	-0.013	0.013
emp_daylabourer	-0.013	-0.076**	-0.059	-0.063*	0.013
Asset holdings					
owl_h	0.127***	0.152***	0.088**	0.024	-0.049
owl_c	0.020	0.061***	-0.005	0.061***	-0.052***
rickvan_a	0.036**	0.060***	0.008	0.025	-0.035
rooftin	0.062***	0.019	0.012	-0.045**	-0.001
radiotv_a	0.009	0.019	-0.013	0.01	-0.028*
Food Security					
twicemeal	0.101***	0.094***	0.084***	-0.004	-0.071**
egg	0.403***	0.360***	0.142*	-0.044	-0.251**
Social Capital					
invited	0.107***	0.142***	-0.01	0.029	-0.132***

Notes: Results obtained by linear regression with inverse propensity weighing. *, **, *** indicate significance at the 10%, 5% and 1% respectively.

Annex Figures



Annex Figure 7.1: Comparison between the numbers of inclusion and exclusion criteria met by the treated and the control

Note: Inclusion criteria: Household owns less than 10 decimals of land; Main source of income is by female member begging or working as domestic help; no active male adult (female household head); School going children working for pay; No productive or income generating assets.

Exclusion criteria: No Active female member in the household; Microfinance participants; Household members receive government benefits.

Summary

Developing counties have established a number of social safety-net programmes to deal with various concerns. These programmes cover issues ranging from health, nutrition, education and job creation using public works and other approaches. Typically, such programmes focus on specific areas. For example, conditional cash transfer (CCT) programmes focus on providing cash transfers to reduce child labour and enhance human capital investments or for instance, the recognition that catastrophic healthcare expenditure is one of the most common factors in precipitating poverty has led to the implementation of a variety of health insurance schemes throughout the developing world. Indeed, the push towards universal healthcare coverage (UHC) is providing further impetus to the development of health insurance schemes.

While not challenging the usefulness of programs that focus on a specific area, the last two decades have also seen the advent of integrated approaches to poverty alleviation in countries in South Asia and Africa. This is perhaps a useful approach, most notably for the ultra-poor who are typically precluded from traditional market based poverty alleviation approaches. In addition to income generation, these programmes integrate a number of additional components such as training and transfers related to health, education, nutrition and social mobilization. The fact that generally separates these approaches from traditional interventions is that as opposed to a one-off push, these programmes require participation over a certain duration over which the additional services are delivered. Though the scope, the targeted population and the components vary considerably, programmes such as these are gaining popularity and are being implemented across a number of developing countries.

This thesis evaluates two social safety-net programs implemented in South Asia. One of these focuses on a single area, health insurance, while the other is an integrated program. The first half of the thesis (Chapter 2 to 4) focuses on the evaluation of two health insurance schemes that have been implemented in India. The first is a Community Based Health Insurance (CBHI) scheme that provides coverage for both in and outpatient care. The second scheme is a high-profile national insurance scheme called *Rashtriya Swasthya Bima Yojana* (RSBY), implemented by the Government of India. The latter half of the thesis (Chapters 5 to 7) focuses on an ultra-poverty alleviation programme undertaken in Bangladesh called *Challenging the Frontiers of Poverty Reduction: Targeting the Ultra-poor* (CFPR:TUP). The programme uses an integrated approach to ultra-poverty alleviation through the provision of income generating assets and multifaceted training over a duration of two years.

1.0 Evidence from health insurance schemes in India

The analysis of the two health insurance schemes, namely the Community Based Health Insurance Schemes offered in three sites (Kanpur Dehat, Vaishali, and Pratapgarh) and the nationally implemented *Rashtriya Swasthya Bima Yojana* (RSBY) focus on the effects of the scheme on healthcare utilization and financial protection.

In terms of design features, the CBHI schemes evaluated here are supported by NGOs but entirely financed and run by the local community in which they operate. The schemes provide outpatient coverage from Rural Medical Practitioners (RMPs) on a capitation basis. This mode of contract offers patients unlimited consultations and free medicines from the RMPs. The schemes also offer cover

inpatient costs of up to Rs. 4000 per person per year (PPPY) at a cost of about Rs. 195 PPPY (1.5% of annual per capita expenditure). Using a randomized control trial, we find no tangible effects of CBHI on healthcare utilization or financial protection in two of the three sites (Kanpur Dehat and Vaishali). In the third site (Pratapgarh), the CBHI scheme is associated with a drop in the likelihood of seeking outpatient care.

The RSBY scheme targets households below the poverty line (BPL) and provides cashless protection against hospitalization costs. Families of up to five persons pay an annual premium of INR 30 per year for protection against hospitalization costs of up to INR 30,000 in any RSBY designated hospitals. The thesis focuses on Bihar and Uttar Pradesh, and for these two states assesses the determinants of enrolment and dropout, followed by an assessment of the link between scheme membership and healthcare utilization and financial protection among below-poverty-line (BPL) households. The analysis shows that the less wealthy, lower educated households or households belonging to scheduled castes/tribes are more likely to enrol and stay in the programme. There is evidence of adverse selection and households with a higher proportion of members with chronic conditions are more likely to enrol and have a lower likelihood of dropping out. Insurance related awareness plays a role in determining a household's decision to enrol and continue with RSBY's coverage. Results also indicate that insurance uptake is influenced by accessibility to the empanelled hospitals. Association between RSBY membership and healthcare utilization is limited. With regard to financial protection, only insured households in Bihar experienced a reduction in out-of-pocket spending and as a result, lower debt.

2.0 Integrated approach to ultra-poverty reduction in Bangladesh

The latter half of the thesis evaluates the impact of an integrated approach to ultra-poverty alleviation. Entitled, *Challenging the Frontiers of Poverty Reduction: Targeting the Ultra-Poor* (CFPR), the programme was launched in the poorest districts of Bangladesh in 2002. The programme provided income generating assets valued at approximately USD $140 and a comprehensive livelihood development training programme to encourage entrepreneurship. Once selected, the participants enrolled in the programme for two years. The evaluation examined the effect of the programme on various outcomes and across different time periods: short term (two years post- graduation), medium-term (four years post-graduation) and long-term (seven years post-graduation).

Using a randomized control trial, the thesis first examines the short term effects of CFPR on the nutritional status of the participants and spill-over effects on households in communities where the programme took place. Considerable improvement was seen in the nutritional status of ultra-poor household members, most pronounced for children below 5. Results also indicate that the programme has positive externalities. Two factors are important to note: first, magnitudes of the spill over effects were generally half of the effects on the treated, and second, the spill-over effects were restricted to other poorer households in the community. The increase in children's nutritional status was largely driven by increased duration of exclusive breastfeeding. For older individuals, improvements were created through increased food security and hygiene practices. Assessment of the heterogeneity of

impact showed greater benefits among female headed households while the effects were found to be gender neutral among individuals.

Subsequently, the thesis assesses the impact of the project over the medium and long term using quasi-experimental methods. These outcomes include income, employment choices, productive and non-productive asset holdings, food security and social capital. We find that the effects of CFPR nearly double between the short and medium terms. The effects on income levels for instance, increase to BDT 1493 (in the medium term) compared to BDT 826 during the short term. The participants increase their productive asset base (such as livestock, rickshaws and cultivable land) and expand their businesses through increased financial market participation. In the long-term, while the outcomes for the participants remains substantially higher than the control, there are no incremental effects between the medium and long term (income, for instance, was BDT 1300 higher among the treated and significant at conventional levels).

Samenvatting

Ontwikkelingslanden werken met sociale vangnetprogramma's om verschillende problemen aan te pakken. Deze programma's hebben betrekking op vraagstukken die kunnen variëren van gezondheid en voeding tot onderwijs en werkgelegenheid en maken onder meer gebruik van openbare werken. Gewoonlijk richten dergelijke programma's zich op specifieke gebieden. Zo richten programma's voor voorwaardelijke subsidies (conditional cash transfer – (CCT) zich op terugdringing van kinderarbeid en verhoging van de investeringen in menselijk kapitaal. En de erkenning dat catastrofale uitgaven voor gezondheidszorg tot de belangrijkste oorzaken van toenemende armoede behoren, heeft in veel ontwikkelingslanden geresulteerd in de invoering van verschillende zorgverzekeringsregelingen. Het streven naar een universele zorgdekking vormt daarbij een extra stimulans voor de ontwikkeling van zorgverzekeringsregelingen.

Behalve de programma's die zich op een specifiek gebied richten en waarvan we het nut zeker niet in twijfel willen trekken, hebben we de afgelopen twee decennia in landen in Zuid-Azië en Afrika ook integrale methoden zien opkomen om de armoede te bestrijden. Die benaderingen zijn in potentie nuttig, met name voor personen die in extreme armoede leven, die gewoonlijk niet bereikt worden met de traditionele, op de markt gebaseerde armoedebestrijdingsinspanningen. Deze programma's genereren niet alleen inkomsten, maar omvatten ook een aantal extra componenten, zoals scholing en overdrachten op het gebied van gezondheid, onderwijs, voeding en maatschappelijke mobilisering. Deze programma's onderscheiden zich doorgaans van traditionele interventies doordat zij, in tegenstelling tot een eenmalige stimulans, uitgaan van participatie gedurende een bepaalde tijd, namelijk de periode waarin de aanvullende diensten worden verleend. De omvang, doelgroep en onderdelen kunnen aanzienlijk verschillen, maar over het algemeen winnen deze programma's aan populariteit en worden zij in verschillende ontwikkelingslanden toegepast.

In dit proefschrift worden twee sociale vangnetprogramma's in Zuid-Azië geëvalueerd. Een van de programma's richt zich op een enkel gebied, namelijk de zorgverzekeringen, terwijl het andere een integraal programma is. In eerste helft van het proefschrift (hoofdstuk 2 t/m 4) worden twee zorgverzekeringsregelingen in India geëvalueerd. De eerste is een zogeheten Community Based Health Insurance-regeling (CBHI – zorgverzekering op gemeenschapsbasis), die dekking biedt voor zowel klinische als poliklinische patiënten. De tweede regeling is een grootschalig nationaal verzekeringsstelsel, *Rashtriya Swasthya Bima Yojana* (RSBY) genaamd, dat is ingevoerd door de regering van India. De tweede helft van het proefschrift (hoofdstuk 5 t/m 7) heeft betrekking op een programma voor de bestrijding van extreme armoede in Bangladesh, met de naam *Challenging the Frontiers of Poverty Reduction: Targeting the Ultra-poor* (CFPR:TUP). Met dit programma wordt de bestrijding van extreme armoede integraal aangepakt doordat er gedurende twee jaar inkomstengenererende activa en een veelzijdige scholing worden aangeboden.

1.0 De praktijk van zorgverzekeringsregelingen in India

Bij de analyse van de twee zorgverzekeringsregelingen, namelijk de op drie locaties (Kanpur Dehat, Vaishali en Pratapgarh) aangeboden Community Based Health Insurance en de landelijk ingevoerde *Rashtriya Swasthya Bima Yojana* (RSBY), is met name gekeken naar de effecten van deze regelingen op het zorggebruik en de financiële bescherming.

De geëvalueerde CBHI-regelingen worden qua ontwerpkenmerken weliswaar gesteund door ngo's, maar ze worden volledig gefinancierd en beheerd door de lokale gemeenschap waarin ze functioneren. De regelingen voorzien in een poliklinische per capita-dekking van plattelandsartsen (Rural Medical Practitioners – RMP's). Deze contractmethode biedt patiënten een onbeperkt aantal consulten en gratis medicijnen van de RMP's. Daarnaast biedt de regeling dekking voor klinische kosten tot INR 4000 per persoon per jaar (PPPJ) tegen een kostprijs van ongeveer INR 195 PPPJ (1,5% van de jaarlijkse uitgaven per hoofd van de bevolking). In twee van de drie locaties (Kanpur Dehat en Vaishali) hebben we met een gerandomiseerd gecontroleerd onderzoek geen tastbare effecten van CBHI op het zorggebruik of de financiële bescherming waargenomen. In de derde locatie (Pratapgarh) wordt de CBHI-regeling in verband gebracht met een afname van de kans dat er een beroep op poliklinische zorg wordt gedaan.

De RSBY-regeling is gericht op huishoudens onder de armoedegrens en biedt bescherming tegen hospitalisatiekosten zonder contant geld. Gezinnen tot vijf personen betalen een jaarpremie van INR 30 voor bescherming tegen hospitalisatiekosten tot INR 30.000, in alle aangewezen RSBY-ziekenhuizen. In dit proefschrift ligt de focus op Bihar en Uttar Pradesh, en voor deze twee staten zijn de bepalende factoren voor inschrijving en uitschrijving in kaart gebracht, gevolgd door een evaluatie van de relatie tussen deelname aan de regeling en het zorggebruik en de financiële bescherming onder huishoudens onder de armoedegrens. Uit de analyse blijkt dat huishoudens naarmate zij minder welgesteld en lager opgeleid zijn, zich sneller voor het programma inschrijven en ook ingeschreven blijven. Hetzelfde geldt voor huishoudens die tot geregistreerde kasten/stammen behoren. Er is aantoonbaar sprake van adverse selectie: huishoudens met meer leden met chronische aandoeningen schrijven zich sneller in en schrijven zich minder vaak uit. Bekendheid met verzekeringen speelt een rol bij het besluit van een huishouden om zich in te schrijven en ingeschreven te blijven voor de RSBY-dekking. Ook blijkt uit de resultaten dat het sluiten van een verzekering wordt beïnvloed door de toegankelijkheid van de deelnemende ziekenhuizen. Het verband tussen deelname aan de RSBY en het zorggebruik is beperkt. Wat de financiële bescherming betreft, ervaren alleen verzekerde huishoudens in Bihar een vermindering van contante uitgaven en daardoor minder schulden.

2.0 Geïntegreerde benadering van de bestrijding van extreme armoede in Bangladesh

In de tweede helft van het proefschrift wordt de impact van een geïntegreerde benadering van de bestrijding van extreme armoede geëvalueerd. Onder de naam *Challenging the Frontiers of Poverty Reduction: Targeting the Ultra-Poor* (CFPR) werd in 2002 een programma gelanceerd in de armste districten van Bangladesh. Het programma voorzag in inkomstengenererende activa ter waarde van

ongeveer USD 140 en een uitgebreid scholingsprogramma op het gebied van levensonderhoud, om het ondernemerschap aan te moedigen. Na hun selectie schreven de deelnemers zich voor twee jaar voor het programma in. Voor de evaluatie werd het effect van het programma op verschillende resultaten en in verschillende periodes onderzocht: korte termijn (twee jaar na afstuderen), middellange termijn (vier jaar na afstuderen) en lange termijn (zeven jaar na afstuderen).

Met behulp van een gerandomiseerd gecontroleerd onderzoek werden eerst de kortetermijneffecten van CFPR op de voedingssituatie van de deelnemers onderzocht, alsmede de uitstralingseffecten op huishoudens in gemeenschappen waarin het programma liep. Er werd een substantiële verbetering waargenomen in de voedingssituatie van de leden van extreem arme huishoudens. Deze was het meest uitgesproken voor kinderen van jonger dan 5 jaar. Ook bleek uit de resultaten dat het programma positieve externe effecten heeft. In dit kader zijn twee factoren van belang: ten eerste waren de neveneffecten over het algemeen half zo groot als de effecten op de behandelden, en ten tweede bleven de neveneffecten beperkt tot andere armere huishoudens in de gemeenschap. De verbetering in de voedingssituatie van kinderen was grotendeels te danken aan het feit dat er langere tijd uitsluitend borstvoeding werd gegeven. Voor oudere mensen werden verbeteringen gerealiseerd dankzij een verbeterde voedselveiligheid en hygiënische praktijken. Uit de evaluatie van de heterogeniteit van de impact bleek dat de voordelen groter waren in huishoudens met een vrouw aan het hoofd, terwijl de effecten genderneutraal waren onder afzonderlijke individuen.

Vervolgens werd de impact van het project op de middellange en lange termijn beoordeeld aan de hand van quasi-experimentele methodes. Daarbij werd onder meer gekeken naar inkomens, werkgelegenheidskeuzes, het aanhouden van productieve en niet-productieve activa, voedselveiligheid en sociaal kapitaal. Wij hebben geconcludeerd dat de effecten van CFPR tussen de korte en middellange termijn bijna verdubbelen. Zo stijgen de effecten op inkomensniveaus tot BDT 1493 (op de middellange termijn), in vergelijking met BDT 826 op de korte termijn. De deelnemers vergroten hun productieve-activabasis (zoals vee, riksja's en bebouwbare grond) en breiden hun activiteiten uit door middel van een sterkere participatie in de financiële markt. Hoewel de resultaten voor de deelnemers op de lange termijn aanzienlijk hoger blijven dan voor de controlegroep, zijn er geen incrementele effecten tussen de middellange en de lange termijn (zo was het inkomen onder de behandelden BDT 1300 hoger, en significant op conventionele niveaus).

Acknowledgements

Over the course of the PhD during the past four years, I have often fantasised about this moment and what it would feel like when I'm writing the acknowledgements. While the elation is certainly escalating at the prospect of having a new title, the thought of it being *over and done with* is taking something away from it. There are a large number of people to whom I owe gratitude for their support through this journey. It's certainly not an easy thing to single out to thank everyone who matter, I genuinely hope I will not have missed anyone.

The two people at the forefront of it all and the most deserving, my mentors and guardians during the process, are Arjun Bedi and Ellen van de Poel. When I first started, the learning curve was much steeper than I had anticipated. All PhD candidates, more or less, go through various "crises" during these four years. For me, most the "crises" occurred early on and Ellen bore the brunt of it. I genuinely can't thank you enough for the time and the effort you put in to get me through it (including prompt replies to my innumerable and sometimes inane emails at even 12 in the morning!). You were also a big source of support outside the PhD, especially after Iyana was born. As for Arjun, you have really taught me how to deal with the various nuances of not only academia, but the softer side of things such as dealing with sometimes difficult and convoluted situations. Lastly and somewhat off topic, I have never mentioned this as it's quite obvious, but I'm in awe of your writing and I really aspire to be as skilful as you someday. Thank you both again for not only giving me the opportunity to pursue this degree but also steadfastly guiding me through it.

While the PhD is a lonely business on principle, I had the good fortune of being able to work with a number of people from different countries. Thanks to David Dror and Pradeep Panda from the Micro Insurance Academy for having me over in Delhi on multiple occasions and to all the colleagues there who presented me with exciting learning experiences. I want to single out two people, Arpita Chaktabarti and Sunil Saroj. If you guys weren't there, I'm not sure how well I might have survived those gruelling months in the villages of Bihar and Uttar Pradesh. We really did have a lot of fun, especially the post-survey biryanis!

Thanks to the Research and Evaluation Division of BRAC for allowing me to use their data (especially to the data collection team and field staff) and to my colleagues at both the Impact Assessment and Economics units, notably Andrew Jenkins and Narayan Das for all your support before and during this process. I also want to take this opportunity to mention Dr. Mahabub Hussain, who recently passed away. Not only was he a great resource and leader for BRAC, but also a great mentor who always encouraged us to strengthen the researcher inside through critical thinking, higher education and keen insight. You will be missed.

To Frans Rutten, firstly, not only thank you for supporting the decision to hire me for this position, but also for agreeing to pay for not one, but two round trip tickets from Bangladesh during the interview! You have helped tremendously in making our initial transition seamless. You have also been instrumental in ironing out some of the big and small road blocks along the way and it undoubtedly would have been considerably more difficult without your unequivocal support.

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Specifically to Owen, you are difficult man to please, but it was well worth the effort! I really appreciated all your help. Last but not the least, a special thanks to Liza Moreira for helping and guiding me through the bureaucratic hurdles of obtaining a PhD.

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Finally are my family members who have supported me throughout. My mother Neelofar Chowdhury, my little sister Immita Manal and my father Mushtaque Chowdhury. I could not have been here without your guidance, support and courage in the first place. I have to single out my father here and say that you are the reason why I ever thought of pursuing this degree in the first place and you inspire me, by example, to want to be like you more every day! For members for my extended family, relatives and friends, both on and off topic from the PhD your support really meant a lot, and a special mention of the two big brothers Mamnoon (thanks for your help with things that matter!) and Mimmo bhaiya.

And the two people who have the strongest claim to this accomplishment are my wife Farzana Misha and our daughter Iyana Amariah. Misha, not only are you my partner in life, but a co-author in a third of my PhD (I'm fairly certain very few will be able to claim that)! While I have no doubts that it'll happen many times over, I will definitely miss the late night bartering over who changes the diapers versus who does the analysis. Most importantly, you push me to venture outside my comfort zone. While I did and will likely continue to resist this from time to time, it pushes me to try bigger and better things and I thank you for that. Iyana, you are our "high cost-high reward" bundle of joy, hope you always keep me on my toes and keep on saying "khabee?"

Curriculum Vitae

Originally from Bangladesh, Wameq Raza moved to New York, US in 2002 and began his undergraduate degree in Economics at Ithaca College. Upon successful completion of the degree in 2006 (cum laude), he joined the Department of Social Services for a year, where he worked as a programmer to aid the digitization of the workflow of the organization.

In line with his continuing interest in poverty dynamics and development, Wameq Raza moved to Brighton, UK in 2007 to pursue a Masters degree in Development Economics from the University of Sussex. Thereafter he moved back to Bangladesh in 2008 to work for the international NGO called BRAC. Though he began his career at BRAC as a member of the implementation team of a large scale integrated ultra-poverty alleviation programme, interest in research led him to the Research and Evaluation Division (RED) of the organization, where he spent the next three years. This experience led to publications, conference presentations and collaborative work with both national and international organizations in the fields of livelihood development, poverty alleviation and welfare.

To further develop skills in research, he joined the PhD programme in the Institute of Health policy and Management at Erasmus University Rotterdam in Jan 2012. The primary focus of the degree was the randomized evaluation of a Community Based Health Insurance Scheme in rural northern India. The thesis was complemented by evaluations of the aforementioned integrated ultra-poverty alleviation programmes based out of Bangladesh. During this time, he also taught workgroups in the Masters of Health Economics, Policy and Law and supervised Masters theses.

Wameq Raza has recently accepted a research position with BRAC International and will be moving to Kampala, Uganda.

PhD Portfolio

	Relevant Work Experience
Research	
2012-2016	Researcher in Health Economics *(See annex list for related outputs)* Institute of Health Policy and Management, Erasmus University Rotterdam, The Netherlands Key responsibilities: – Investigate pathways through which core project outcomes are better incentivized – Relationship management with implementation and donor consortium – Supervise and assist in the data collection process – Supervise Masters students' thesis in Health Policy and Law, Erasmus University – Teach working groups in the Advanced Research Methods course
2009-2012	Senior Research Associate *(See annex list for related outputs)* Research and Evaluation Division, BRAC, *Bangladesh* Key responsibilities: – Consult with implementing departments to identify evaluation needs and strategies – Supervise the implementation of primary surveys (instrument development, enumerator management, field-testing, logistics) – Provide feedback to relevant programs based on study outcomes and field level observations – Facilitate capacity development in empirical impact evaluation methods
2009	Research Associate, Research and Evaluation Division, BRAC, *Bangladesh*
Program implementation	
2008-2009	Senior Area Manager Targeting the Ultra-Poor (CFPR-TUP), BRAC, *Bangladesh* – Troubleshoot operational bottlenecks – Ensure empowerment of the extreme-poor by fostering community-elite participation in program activities – Ensure optimal budget allocation and management – Implementation of corporate operational decisions at the field level – Relationship management with donor consortium and evaluation staff – Manage exposure visits from international delegates
2008-2009	Senior Area Manager Targeting the Ultra-Poor (CFPR-TUP), BRAC, ***Bangladesh*** – Troubleshoot operational bottlenecks – Ensure empowerment of the extreme-poor by fostering community-elite participation in program activities – Ensure optimal budget allocation and management – Implementation of corporate operational decisions at the field level – Relationship management with donor consortium and evaluation staff – Manage exposure visits from international delegates

Internships	
2007	Research assistant The World Bank, *Bangladesh*
2006-2007	Project assistant Department of Social Services, NY, *United States*
2002	Research Assistant Research and Evaluation Division, BRAC, *Bangladesh*
	Education and training
Education	
2012-2016	Ph.D. in Health Economics *(Evaluation of social safety-nets in Bangladesh and India)* Erasmus University Rotterdam, *The Netherlands*
2007-2008	M.A. in Development Economics *(Thesis title: Determinants of infant and child mortality: Evidence from Bangladesh)* University of Sussex, *United Kingdom*
2002-2006	B.A. in Economics, cum laude *(Thesis title: What worked and what didn't: A fresh look at the Millennium Development Goals)* Ithaca College, *United States*
Additional Training	
October, 2012	Empirical analysis of panel data in health econometrics University of York, *United Kingdom*
May, 2012	Impact evaluation methods ISS, Erasmus University Rotterdam, *The Netherlands*
June, 2011	Economic evaluation of community level interventions: theory and practice University of Aberdeen, *Conducted in Bangladesh*
June, 2009	Stages of Progress: alternative targeting techniques for the ultra-poor Duke University, *Conducted in Bangladesh*

Reviewed scientific articles in the following peer reviewed journals

Journal of Development Effectiveness; Review of Development Economics; Development in Practice; PLOS One; Journal of Poverty

Interests and hobbies

Photography; travel; running; percussion

Publications

Peer Reviewed Articles

Raza, Wameq A., van de Poel, E.V., Panda, P., Dror, D.M., & Bedi, A.S. (2016). "Healthcare Seeking Behavior among Self-help Group Households in Rural Bihar and Uttar Pradesh, India", *BMC Health Services Research* 16:1. doi: 10.1186/s12913-015-1254-9. (In thesis)

Raza, Wameq, van de Poel, Ellen; Bedi, Arjun; Rutten, Frans (2015) "Impact of community based health insurance on access to care and financial protection in rural India: evidence from three randomized control trials." Forthcoming in *Health Economics*. doi:10.1002/hec.3307. (In thesis)

Raza, W. A., Narayan C. Das & Farzana A. Misha (2012): "Can ultra-poverty be sustainably improved? Evidence from BRAC in Bangladesh", *Journal of Development Effectiveness*, 4:2, 257-276. (In thesis)

Raza, W. A., Ara, J. (2012). "Grant Based Approach to Poverty Reduction: Evidence from Bangladesh". *OIDA International Journal of Sustainable Development*, 3(6), 37-56

Papers currently under review

Raza, Wameq A.; van de Poel, Ellen; Panda, Pradeep (2015) Analyses of enrolment, dropout and effectiveness of RSBY in northern rural India. (In thesis)

Neelson, Sven; van de Poel, Ellen; **Raza, Wameq A**; Panda, Pradeep (2015) Are health shocks to earners different? The economic consequences of disability in rural India.

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Raza, Wameq A; van de Poel, E.V., Bedi, A.S. & Rutten, F. (2015) "Impact of community based health insurance on access and financial protection: Evidence from three randomised control trials in rural India", **International Health Economic Association (iHEA): De Gustibus Disputandum Non Est! Health Economics and Nutrition.** University of Bocconi. July 2015, Milan, Italy.

Misha, Farzana; **Raza, Wameq A**; Ara, Jinnat; van de Poel, Ellen (2014) "How far does a big push really push: Mitigating ultra-poverty in Bangladesh", **Making Impact Evaluation Matter, Asian Development Bank.** Hosted by: Asian Development Bank, 3ie and PIDS. September, 2014, Manila, Philippines.

Raza, Wameq A; van de Poel, E.V., Panda, P., Dror, D.M., & Bedi, A.S. (2013) "Impact Assessment of Community Based Health Insurance Schemes in Rural India", **Health Systems Asia: Equity, Governance and Social Impact; National University of Singapore.** Lee Kuan Yew School of Public Policy, National University of Singapore. December 2013, Singapore City, Singapore.

Raza, Wameq A; Ara Jinnat (2011) "Grant Based Approach to Poverty Reduction: Evidence from Bangladesh" **International Conference on Sustainable Development**. OIDA Conference Abstracts ISSN: 1923:6670. Hosted by: OIDA, ICIRL and CRSJP. December 2011, Malaysia.

Raza, Wameq A; Das, Narayan C, Ara Jinnat, Shams Raniya (2011) "Direct and Community Level Impacts of a Grant Based Approach to Poverty Alleviation" **International Conference on Scaling-Up Social Protection in Bangladesh: Building Effective Social Ladders and Safety Nets**. Hosted by: UNDP, Government of Bangladesh (Planning Commission), WFP, AusAid and DFID. October 2011, Bangladesh.

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Kamruzzaman, MD; Hossain, NZ; Bhattacharjee, A; Akter, A; **Raza, Wameq A**; Malek, MA; Das, NC (2012) "Social Network and Financial Literacy among Rural Adolescent Girls: Qualitative Assessment of BRAC's SoFEA Programme", BRAC RED Working Paper No 34, BRAC Printers, Dhaka

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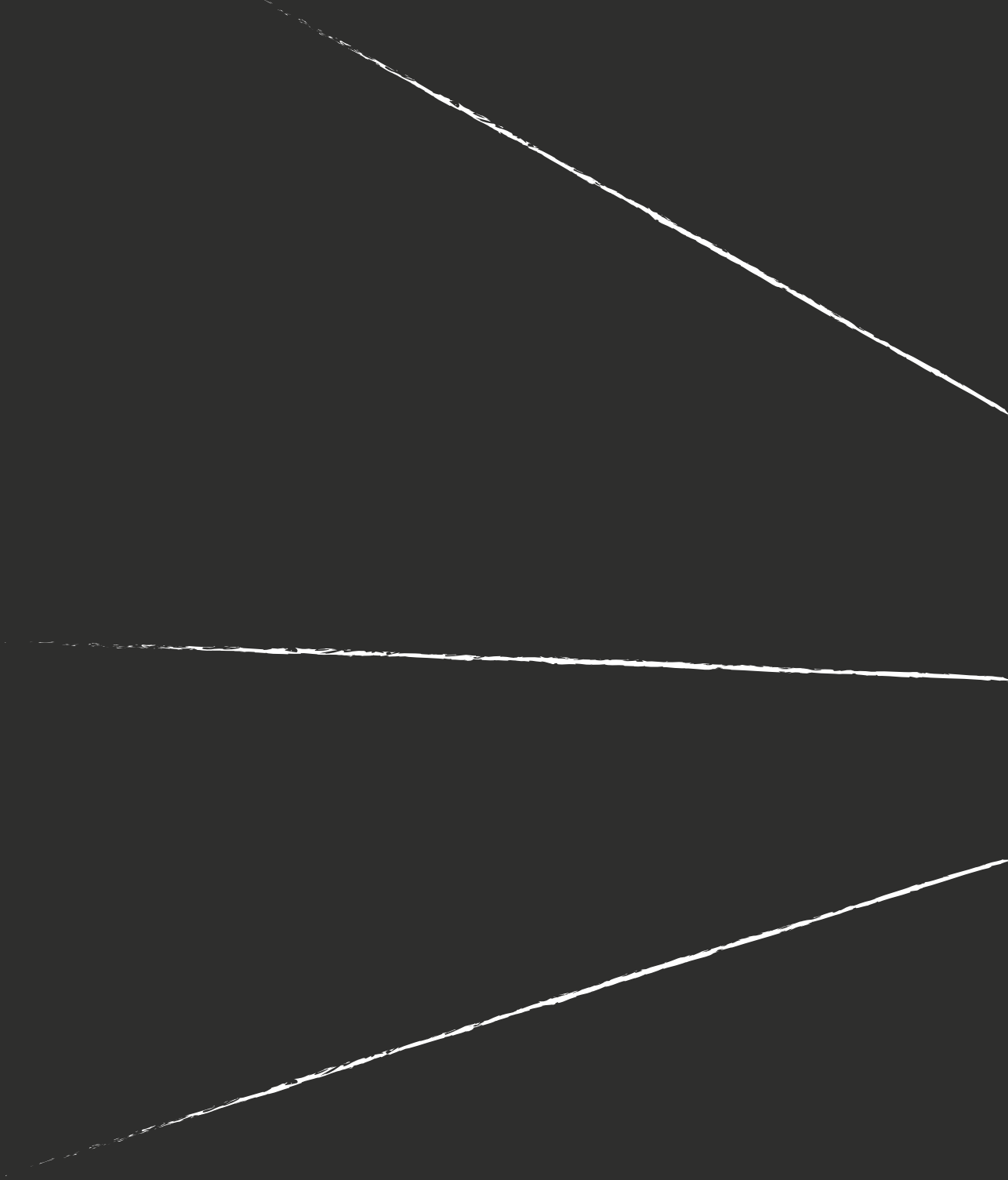

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