Individual social capital and extreme poverty: when is it good or bad capital for women's health?

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Abstract

Social capital is extremely important in determining the wellbeing, and particularly health outcomes, of the poorest women in society. Yet the impact of different types of social capital on health can vary significantly and according to different situations. Despite this, relatively little is known about such effects and how different types of individual social capital affect the health outcomes of the poorest women. Using experimental data, we identify how social capital effects vary among treatment and control groups in Bangladesh, capturing the effects of four different social capital measures and investigating their impact on women's health. The findings of the study show a positive association between social capital and self-reported health among the treatment group but negative for those in the control group. These results indicate that increased social capital is not always good for the health outcomes of extremely poor women. The effect of social capital on health outcomes may vary depending on the efforts required and the cost implications associated with creating and maintaining social networks. Our findings also highlight the fact that the quality of social capital, rather than the quantity of it, is more important for creating better health outcomes among women living in extreme poverty.

Keywords

Social capital, health, women, extreme poverty, Bangladesh

JEL Codes: A13, C31, E22, I14, P46

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1 Introduction

Understanding how different dimensions and types of social capital affect the wellbeing, and particularly health outcomes, of the very poorest is critical in designing and implementing social policy interventions (Villalonga-Olives & Kawachi, 2017). The creation of social capital can be an important determinant in accessing different healthcare services and achieving better health outcomes (Eriksson, 2011). Social capital is commonly considered to be an embedded resource within social networks (Bourdieu, 1986; Lin, 1999). However, the association between social capital and health varies for different situations and conditions (Ehsan et al, 2019). This is particularly the case for the very poorest women, where detachment from mainstream market services and an inability to access health services may be particularly acute, compared with the situation for men, and may accentuate outcomes (Herberholz & Phuntsho, 2018).

We contribute to the social capital–health literature in two ways. First, we focus on extremely poor women and determine how their level of social capital is associated with their health status. Murayama et al (2012) noted that social capital may have a varying impact on the health conditions of different population subgroups – beneficial to some and yet simultaneously harmful to others. Furthermore, effects may vary widely across different population groups (Eriksson

& Nawi, 2015). Research focusing on the gendered health and social capital perspective is rare (Pinillos-Franco & Kawachi, 2018). As men and women accumulate social capital differently, there might be gendered differences associated with the effect of social capital on health (Gidengil & O'Neill, 2006). Such differences may be more significant among vulnerable groups – such as extremely poor women – through social isolation, discrimination and health service provider bias (Matin & Begum, 2002). We add value to the current literature in understanding how extremely poor women's individual-level social capital is associated with their health status.

Second, by conceptualising social capital as a multidimensional entity, we can determine whether different dimensions of social capital have varying effects in different contexts. Many previous social capital studies have used cross-sectional data, while very few have used experimental or longitudinal data (Rodgers et al, 2019; Buck-McFadyen et al, 2019; Grootaert & Bastelaer, 2001). For this paper, we used data from Bangladesh, where 14.8% of the population lives in extreme poverty (BBS, 2016), and health shocks are considered to be one of the main determinants of extreme poverty (Bridges et al, 2011; Kabeer, 2000; Sen, 2003). Thanks to the experimental study design, we were able to use the data to identify how social capital effects vary among treatment and control groups.[1] Although such study design limits the ability to make general claims about the association, it enables us to identify different conditions that affect the relationship between social capital and health. Finally, adopting a network-based approach to social capital, in contrast to the community- and mass-level approach, focuses on both the positive and negative sides of social capital and helps measure its varying effects.

The socioeconomic environment in which we are born, grow and live affects our health conditions. Scholars have identified social capital as an important social determinant of health (Alpaslan & Yildirim, 2020). The central reasoning behind this assumption is that social capital helps people access resources within formal and informal networks that can provide an array of health information, access to

[1] The treatment group received programme interventions which included enterprise development training, asset transfer, hands-on training through group meetings and home visits, savings matching, healthcare support and community resource mobilisation. The group received these interventions over a two-year period. The control group, as the name suggests, did not receive any of the programme interventions.

different healthcare services and can result in better health outcomes. However, social capital research has been characterised by the utilisation of different definitions and measurement techniques (Moore & Carpiano, 2020). Along with the network approach, two other prominent approaches are the macro-level approach promoted by Putnam (1993) and the community-level approach promoted by Coleman (1988). We argue that, as extremely poor women are excluded from society, even if the community and society have more social capital, they may not necessarily be able to access it. Thus, an individual-level approach is most appropriate.

Using a position generator tool to measure the social capital of extremely poor women,[2] and following Lin (1999), we developed three indicators for individual-level social capital: volume, upper reachability and reach. In addition, we used the factor analysis technique to construct a composite measure of the social capital index. We measured the association between the different dimensions of social capital and self-reported health of extremely poor women, considering sample treatment and control groups. In line with Downward et al (2020), Folland (2007) and Habibov and Weaver (2014), as part of the robustness check, we applied instrumental variable (IV) methods to check endogeneity issues relating to social capital and health.

Our findings indicate that the effect of social capital may indeed vary according to different contexts and that social capital is not always good for extremely poor women's health. We found social capital to be negatively associated with extremely poor women's health in the control group. However, the relationship was positive among the treatment group. Programme interventions seem to play an essential role by reducing the cost of creating health-specific networks (Moore et al, 2009). We also found that the composite measure of social capital has the highest positive impact on health, followed by upper reachability and range of social capital. However, we did not find any significant positive impact of the volume of social capital on extremely poor women's health.

[2] The position generator tool was first introduced in 1975 in the Albany study (Lin & Dumin, 1986). The tool is used in a survey where the researchers ask the participants whether they know someone within a limited list of occupations representative of the national population (Lin & Dumin, 1986). After this, additional questions are asked to determine their relationship.

The remainder of the paper is organised as follows. Section two provides a thorough literature review, considering the relationship dynamics between social capital and health outcomes. Section three presents data sources, variable definitions and details of the formation of social capital indicators. Section four outlines the statistical modelling before we summarise the overall findings and conclude in section five.

2 Literature review

2.1 Social capital and extremely poor women

Earlier research has suggested that the poorest segments of the population, particularly women, have less access to social network support. Gender-based differences in social capital are also associated with women's different positioning within the social structure (Moore, 1990; Erickson, 2003). Differences in strategic location create three disadvantages for women that explain the gendered difference in social capital ownership. These are related to opportunity, attractiveness and homophily.

First, men and women have different social circles, which provide different social contact opportunities. Women are less likely to be employed outside the home and usually take more responsibility for various housework chores and childcare, reducing their opportunities to create network ties with non-relatives outside their homes (Dykstra, 1995). Entwisle and Henderson (2000) and Chen (2004), for China, found that, even if women do increase the time allocated to paid work, they also maintain time to undertake unpaid work, leading to a dual burden and time poverty. Second, women are less likely to hold the most senior jobs or positions in society, making them less attractive network resources to others (Erickson, 2003). Lastly, as homophily theory suggests, women usually form networks with other women, which is a barrier to accessing diverse network resources (Verbrugge, 1989; McPherson et al, 2001).

Moore (1990) mentions that the ownership of social capital among men and women differs in terms of three characteristics: composition, quality and type. First, women spend more time on housework and childcare and less on socialising (Meng, 2023; Lawson, 2008). As a result, women usually have more relatives and kin in their social network and fewer co-workers (Ferlander et al, 2016; Gidengil &

O'Neill, 2006). Second, as women's strategic location in social network spheres is limited, their social network tends to be homogeneous and less diverse (Ferlander & Mäkinen, 2009). It usually forms with same-sex and similar demographic characteristics, ie age, education, income, etc. Lastly, women usually participate in community networks related to caring, domestic help, education, religion, and so on.

Women also benefit from social capital in a way different from their male counterparts. Usually, they focus on intimacy and disclosure in a relationship, while men concentrate on activity and sociability (Shye et al, 1995). Men usually value rationalism, objectivity and competition; women tend to value empathy, cooperation and sacrifice (Caiazza & Barbara, 2006). Lowndes (2006) sums this up as women generally using social capital for "getting by", whereas men typically use it for "getting ahead". On the other hand, although women receive fewer benefits from social capital, they bear the higher cost of creating it (Gidengil & O'Neill, 2006). Women tend to play the traditional role of support providers and take responsibility for emotional labour. Therefore, they have to bear a higher level of stress to create and maintain social capital.

2.2 Different effects of social capital on health

Much of the social capital and health-focused research has found a positive effect of social capital on different wellbeing outcomes. However, social capital and health research also acknowledge that social capital may have negative consequences (Portes & Landolt, 1996). Hence, we can associate social capital with both positive (eg happiness and smoking cessation) and negative (eg loneliness, obesity and depression) outcomes (Villalonga-Olives & Kawachi, 2017).

Positive impacts of social capital on health

Song and Lin (2009) identified four pathways that illustrate how network-based social capital can make a positive impact on health outcomes: 1) social capital empowers a person with valuable, timely and updated health information (Ahn et al, 2022; Luu et al, 2022); 2) power and authority gained by a network member can influence health by affecting healthcare policies and controlling health information (Adler et al, 1994; Collins et al, 1995); 3) social credentials gained through network

resources facilitate access to healthcare services (Abrums, 2000); and 4) network members' resources can directly influence health by reinforcing identification (Jetten et al, 2017).

A positive association has been found between network resources and a wide range of health indicators. (see, for example, Verhaeghe & Tampubolon, 2012; Carpiano & Hystad, 2011; Song, 2011; Moore et al, 2009; Song & Chang, 2012). Using US General Survey data, Acock and Hurlbert (1993) measured social capital using a name generator tool;[3] they found a significant positive association between social capital and enhanced life satisfaction. Their analysis also showed a negative association between social capital and anomie. Song and Lin (2009) used both name generator and position generator tools to analyse how social capital affects the health conditions of the adult population in Taiwan. They measured social capital indicators through extensity, reachability, range and a composite social capital index and found a positive impact of different measures of social capital on self-reported health.

Further cross-country evidence includes a positive association between diversity, upper reachability and extensity of social capital and self-reported health (see, for example, Legh-Jones & Moore, 2012; Acock & Hurlbert, 1993). Verhaeghe and Tampubolon (2012) conducted their study in the UK and found a positive association between network-based social capital and self-reported health. Verhaeghe et al (2012) and Han et al (2020) found the same result for their respective studies in Belgium and South Korea.

Negative impacts of social capital on health

Portes and Landolt (1996) identified four pathways through which social capital may negatively affect an individual's health. First, an increase in social capital may impose excessive demands on a person to provide support to others, resulting in adverse health conditions (Alvarez et al, 2017). Second, having more social capital

[3] The name generator tool was first introduced in the 1960s (Marin & Hampton, 2007). It is used in surveys where participants are asked questions (about whom they discuss important personal matters with, chat to or visit) to generate a list of people in their social network. After this, participants are asked follow-up questions regarding the demographic characteristics of their network members and relationships between them.

may enforce informal control, which might restrict a person's freedom (Campbell & Mzaidume, 2001). Third, strong bonding/relationship capital might result in the exclusion of people who are not members of specific groups (Baum, 1999). And last, social capital may enforce group conformity through the 'down-levelling' of norms. Group conformity may impose stress on a person who tries to break free from the group (Portes, 2003).

Song et al (2018) mention three theoretical perspectives to explain the negative effect of network resources on different health outcomes: 1) the social comparison perspective; 2) the unsolicited social support perspective; and 3) the networking cost perspective.

The social comparison perspective argues that higher network resources could cause harm to someone's health by sparking negative or upward social comparison and threatening their self-esteem, prompting different stressful reactions and risky behaviours (Merton & Kitt, 1950). The unsolicited social support perspective argues that, when people have access to network members with much higher resources, they are more likely to receive unsought support. This may damage the recipient's mental health as a result of comparative reference group behaviour, threats to self-esteem, perceived differences from the actual needs of the recipient, and violation of reciprocity (Song & Chang, 2012; Song, 2015). The networking cost perspective argues that creating and maintaining a network involves costs like time, energy and cultural and financial resources (Bourdieu, 1986; Coleman, 1990; Lin, 2001). Such costs can stimulate a direct negative impact on mental health and an indirect negative effect on physical health.

Moore et al (2009) found that lower-educated members of social networks felt a lower sense of mastery when their social network was composed of economically 'better' and more diverse members. Campos-Matos et al (2016) also found that closed networks can negatively affect health outcomes. Verhaeghe et al (2012) and Verhaeghe and Tampubolon (2012) showed that social networks comprised of working-class people were associated with worse self-reported health. Several other studies report a negative effect of social capital on women's health. Eriksson and Nawi (2015) found that remaining in an informal network is negatively associated with self-reported health, with a more substantial effect among women than men. Silvey and Elmhirst (2003) found that women's access to different social networks could protect the overall family but had a negative impact on women's

health, with the extra effort required to create and maintain social networks generating stress and illness. This effect intensified at certain ages, when women remained active in the labour market and when they simultaneously combined work and child-rearing responsibilities.

3 Data, variables and methodology

3.1 Data source and description

We used the impact evaluation data set of the BRAC Ultra Poor Graduation (UPG) programme as a secondary source of quantitative data.[4] In 2017, the BRAC UPG programme was implemented in 21 districts of Bangladesh. Using a random sampling technique, a list of programme participants was created as a treatment group. In addition, a list of non-eligible households was prepared of households with a per capita daily income below US$1.90 at purchasing power parity who were not eligible for the programme as they did not meet other selection criteria set out by it. (For details of the programme selection criteria, see Uddin (2024)). The survey covers the period 2017–20, with a sample of 2,473 households from the treatment group and 944 from the control group across 21 districts (Table 1 and Table 2).

3.2 Matched data

A Propensity Score Matching (PSM) technique was used to create a matched treatment and control group. First, pooling the baseline sample of participants and non-participants and then using the logistic regression model, participation T (propensity score for participation in the programme) was calculated on selected observed covariates for each participant. We used Nearest Neighbourhood (NN) matching with calliper adjustments and with the replacement for all pairwise combinations of treatments. For details of the matching procedure, see Uddin (2024).

[4] The programme follows a certain method of targeting and providing interventions to its participants, termed the 'Graduation Approach'. This approach assumes that extreme poverty is characterised by multiple deprivations, and a set of interventions is required to tackle this multidimensionality and provide a big push to break the poverty cycle. For details, see https://bracupgi.org/.

Dependent variable: self-reported health

Self-reported health was used as an indicator of extremely poor women's health, measured using a 3-point Likert scale. In line with much of the previous literature (Veenstra et al, 2005; Poortinga, 2006; Lindström et al, 2004), we used a dichotomised variable. 'Good' was categorised as good health (1), and 'moderate' and 'bad' were categorised as bad health (2). Despite some authors suggesting the variable might be context-dependent, we adopted it on the basis of a series of supporting evidence.

There is an established association between the experience of physical symptoms and self-reported health (Lawson & Appleton, 2007; Bailis et al, 2001; Garrity et al, 1978). Previous studies have indicated that self-reported measures of health could successfully predict survival for both short and long periods of time (Chipperfield, 1993; Rakowski et al, 1991). In addition to mortality, different studies found a close association between self-reported health and impending morbidity, health expenditure and healthcare usage (Hirve et al, 2012; Blazer, 2008; Jylhä, 2009; Verbrugge, 1989; Barford et al, 2006; Case & Paxson, 2005), limited functional ability (Idler & Benyamini, 1997) and disability-related problems (Månsson & Råstam, 2001). Self-reported health measures have also been found to be nearly identical to different biological measures of health (Banks et al, 2006).

Explanatory variables

Two types of explanatory variable were used within the model: social capital (measured with four indicators) used as the focused variable and different covariates used as control variables.

For social capital we used a position generator tool consisting of 28 items (for position generator tool used for this study, please see ANNEX A), localised, as suggested by Lin and Dumin (1986), for the context of rural Bangladesh. As with Lin (1999), we followed the strategy of non-stratification-based measures, as this provided the opportunity to create multiple measures – in other words, it provided a multidimensional measurement instrument able to reflect vulnerabilities in different aspects of life requiring multidimensional support.

Indicators used to measure social capital include the volume of social capital, average social capital, upper reachability, and range and component scores of network resources (Lin, 2001). As Gaag and Snijders (2005) showed, the measure of average social capital can be correlated with sociodemographic variables, such as gender, and our sample consisted only of women, so we excluded this measure of social capital. We then calculated three measures of social capital: volume, upper reachability and range. Table 3 summarises the scores of three measures calculated for the treatment and control groups.

A correlation matrix was then constructed, with findings suggesting a significant correlation between the aforementioned three variables (Table 4). As such, and in line with Lin (2001), a composite variable was constructed. We conducted a factor analysis following the principal component methodology. We followed the varimax rotation and set the eigenvalue range as equal to or more than 1. Our factor analysis yielded a single-factor solution (Table 5 andTable 6). Later, we calculated a factor score (Table 7 and Table 8) as a weighted sum of three measures, namely (0.340 Extensity + 0.369 Upper Reachability + 0.374 range). The new variable was renamed 'access to social capital'.

Among the other independent variables, control variables included the characteristics of individual women (such as age, age square, number of children, education, etc); household characteristics (such as partner's education, sex of household head, per capita income, family composition, etc), community-level attributes (such as the participant's access to safe water and modern sanitary latrines, etc). These variable selections are in line with Verhaeghe and Tampubolon (2012), Verhaeghe et al (2012), Song and Lin (2009), Legh-Jones and Moore (2012) and Han et al (2012).

3.3 Econometric model

Binary logistic regressions were used to calculate the effect of social capital and its underlying dimensions on the self-reported health of extremely poor women according to the following equation:

$$PR(H_{i=}1) = PR\ (\beta 0 + \beta_1\ S_i + \beta_2 X_i + \beta_3 X_h + \beta_4 X_c + \varepsilon_{ihc}) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(iv)}$$

The self-reported health of extremely poor women is denoted by $H_{i,}$ and exogenous variables determine Hi, i at the individual level, h at the household level

and c at the community level. For the parameters of the various determinants of H_i, β_1 is the parameter for social capital and its underlying dimensions, while the individual-level measurement of the social capital of women is represented as S_i. X_i is a vector of parameters at the individual level that includes age in years, age square, the total number of children, a woman's education level, marital status and stress level. X_h is a vector of the various household-level variables, such as partner's education, sex of household head and family composition, and X_c is a vector of the parameter at the community level, which includes access to sanitary latrines and safe water, availability of health services and access to them.

The endogeneity of wellbeing and social outcomes has been well documented in the literature (Gaag & Webber, 2008; Grootaert & Bastelaer, 2001; Fine, 2010), with arguments suggesting that having more social capital can help people achieve better economic outcomes and vice versa. As a result, social capital research has commonly failed to establish a clear causal relationship between social capital and outcome variables (Mouw, 2006). However, the problem of the circular relationship is mainly related to how social capital has been conceptualised. For example, Coleman (1988) viewed social capital from a functional perspective. Lin (1999) criticised the functional view of social capital as finding the existence of social capital only when it had an impact; in other words, the cause factor is defined by the effect factor.

A significant proportion of the social capital and health literature, including Giordano and Lindström (2016), Poortinga (2006) and Mohseni and Lindstrom (2007), does not explicitly discuss the issue of endogeneity. Notably, however, some authors, such as Booth et al (2014), Rocco et al (2014) and Veenstra et al (2005) do provide some consideration of this issue, although they do not adopt instrumental variable (IV) approaches. These are adopted by Downward et al (2020), Folland (2007), Habibov and Weaver (2014), D'Hombres et al (2010) and Ronconi et al (2012).

Most of the aforementioned studies conceptualised social capital as trust, social participation and group membership, as opposed to the perspective of access to network resources (Giordano & Lindström, 2016; Mohseni & Lindstrom, 2007; Rocco et al, 2014). The literature using a network perspective to conceptualise social capital and self-reported health as a measure of health outcome, for instance Islam et al (2006), Poortinga (2006) and Mohseni and Lindstrom (2007),

raised some concerns regarding the circular relationship. In particular, these authors mention that being in poorer health could hamper a person's mobility and thus reduce their ability to create a network. Hence, as part of our robustness, we conducted further analysis to check for endogeneity using the IV approach.

4 Results and discussion

4.1 Descriptive findings

Considering income generator activities and outside employment specifically, we can see in Table 9 that 90.3% of women from the control sample are involved in outside employment, compared with 67.51% in the treatment group. This suggests that female participants from the control group have relatively greater proportions of total work in comparison with those in the treatment group. Social capital theory suggests that this might result in worse health conditions, as women usually gain less from their efforts to create social networks (Greguletz et al, 2019).

Analysing factors associated with the creation and maintenance of networks that might affect self-reported health (Campos-Matos et al, 2016; Portes & Landolt, 1996; Eriksson & Nawi, 2015), we find that the treatment group of households had significantly more ownership of vehicles and mobile phones (Table 9, vehicle: 15.47%; mobile: 89.76%) compared with the control group households (Table 9, vehicle: 11.70%; mobile: 83.21%). Household ownership of mobile phones and vehicles is crucial for extremely poor women as it is hard for them to access these outside of the household in times of need (Alam et al, 2020). This may indicate that the control group would find it harder to create and maintain network resources, which can negatively affect their health status.

As shown in Table 10, the treatment group had higher access to doctors (treatment: 46%; control: 42%), health support workers (treatment: 43%; control: 36%) and different transport service providers (treatment: 69%; control: 57%). Table 3 indicates that the treatment group had more diversity of access to networks (treatment: 58.84%; control: 53.98%) and higher access to lower-level resources. Both of these are crucial to achieve better health outcomes. Access to more medical service professionals allows women to receive health-related information and health services in times of need (Warner & Procaccino, 2004).

4.2 Findings from regression analysis

We considered four binomial logit regression models, representing each of the social capital measures, to investigate their association with self-reported health. Each differed according to the specific dimension of social capital used as the independent variable (model 1: composite measure of social capital; model 2: volume of social capital; model 3: upper reachability of social capital; model 4: diversity of social capital).

The following discussion focuses on how, and subsequently why, the association between social capital and self-reported health differs between control and treatment sample groups; and compares the effect size of different social capital measures on self-reported health.

Impact of social capital on self-reported health among the control group

Table 11 presents the odds ratios (ORs) and 95% confidence intervals (CIs) for the binomial logit regression models that assess the relationship between self-reported health and different types of social capital measures, while controlling for different sociodemographic and health-related covariates. We found a negative correlation between different social capital measures and self-reported health for the control group. However, among the four social capital measures, the composite measure (OR 0.803) and diversity measure (0.987) were found to have a significant negative association with self-reported health for extremely poor women.

Such findings may support the 'double-edged sword' nature of social capital, at times producing adverse effects from higher-level social capital and negative effects on extremely poor women's health (Moore et al, 2009; Verhaeghe et al, 2012; Campos-Matos et al, 2016; Portes & Landolt, 1996; Eriksson & Nawi, 2015; Silvey & Elmhirst, 2003). Moore et al (2009) have suggested that creating and maintaining a higher network involves more time, energy, financial resources and cultural resources. For some groups, this cost may outweigh the benefits of such networks. This is more significant for women, as they may receive less personal benefit from maintaining resources (Silvey & Elmhirst, 2003). Thus, and as

suggested by Gidengil and O'Neill (2006), although women receive fewer benefits from social capital, they bear a higher cost of creating it.

Second, the aforementioned negative impact may also be partly explained through a social comparison perspective (Song, 2014). Extremely poor women tend to be at the bottom of their social class. Maintaining a network with people of a higher social class might spark an upward or negative social comparison. It could threaten their self-esteem and induce stressful reactions (Eibner & Evans, 2005; Merton & Kitt, 1950). Third, the gendered expectations in Bangladesh society are such that women take the majority burden of household work. In addition, extreme poverty forces them to engage in income-generating activities (Bridges et al, 2011). Harrysson (2013) noted that this double burden could have disproportionate effects on women who are both engaged in the labour market and caring for children – consistent with our data in Table 9, which clearly show that 100% of the women in the control group are involved in household work, and 90.3% of them are engaged in active employment outside the home. That might also explain the negative impact of social capital on their health.

If we consider the differential size effects of social capital measures (Table 11), we find the composite measure of social capital has the highest negative impact (OR 0.803), followed by the diversity measure of social capital (OR 0.987). We previously showed that both the quantity and quality of social capital can have an adverse effect through the network-cost perspective (Moore et al, 2009) and social comparison view (Song, 2014), respectively. As the composite measure of social capital combines both qualitative and quantitative aspects, its effect size is expected to be higher than the diversity of social capital, which primarily focuses on only the qualitative aspect.

Impact of social capital on self-reported health among the treatment group

Table 12 presents the odds ratios (ORs) and 95% confidence intervals (CIs) for a series of binomial logit regression models that assess the associations between self-reported health and different types of social capital measures among the treatment group of the sample. The study found a significant positive relationship between three social capital measures (the composite measure with OR 1.145, the upper reachability measure with OR 1.009 and the diversity measure with OR

1.010) and self-reported health. However, we did not find any significant association between the volume of social capital (OR 1.000) and self-reported health.

Several interesting summaries can be drawn from these findings. While different social capital measures have a negative relationship with self-reported health for the control group, they are positive in the treatment group. This positive association is in line with various earlier studies which found a positive impact of social capital on self-reported health (Verhaeghe & Tampubolon, 2012; Carpiano & Hystad, 2011; Moore et al, 2009; Verhaeghe et al, 2012; Song, 2011; Song & Chang, 2012; Yang et al, 2011). However, the main question remains: why is the relationship reversed in the case of the treatment group while it was negative for the control group?

There are three possible reasons for this. First, the programme had specific interventions to connect female participants with different people in society to create network resource access. As the programme interventions facilitated the creation of these networks, they might have lessened the cost of building and maintaining them for the women participants. These interventions might thus lessen the stress among female participants in creating and maintaining health. With less cost in terms of psychological, physical and cultural resources, programme interventions helped to shift the balance and create more value for women in terms of better self-reported health (Bourdieu, 1986; Coleman, 1990; Lin, 2001).

Second, to improve the participants' health, the programme connected participants to different health professionals and economic wellbeing support interventions. With better financial conditions, their income gap, with a higher reference point, became much smaller than that of the control group. As the comparison perspective suggests, this lower gap with their reference point might explain this positive impact on self-reported health (Festinger, 1953; Merton & Kitt, 1950).

The size effect of social capital on the health outcomes for extremely poor women differs according to different social capital measures. The composite measure of social capital has the highest impact (OR 1.145), followed by the diversity (OR 1.010) and upper reachability measures (OR 1.009). Our findings suggest that,

while the quality of social capital alone can positively impact women's health, just having the volume of resources does not ensure good health for women. There are reasons for this. In particular, while access to the volume of social capital ensures having a quantity of it, not all this social capital might be important from a health perspective (Verhaeghe & Li, 2015; Gaag & Webber, 2008). If we look at the International Socio-Economic Index of Occupational Status (ISEI) index, most health-related professions ranked higher in ISEI scores. This means it is important for the participants to get access to health-related support, which focuses on the importance of having upper reachability social capital.

Diversity measures of social capital indicate that having some lower-level network access is also important for improving health conditions. For a woman, it is essential to have support from neighbours for child-rearing or day-to-day work (Moore, 1990). Sometimes, women require help in case of illness or child-rearing when they visit doctors and hospitals. Usually, they get it from neighbours and friends who are probably from similar social status groups and in the lower range of ISEI scores for the profession. In this case, a woman needs to have access to both kinds of resources and have some diversity within them. The composite measure of social capital combines both quantitative and qualitative perspectives of social capital and has the largest effect on women's self-reported health.

4.3 Robustness check: the issue of endogeneity and IV approach

As we highlighted earlier, the literature suggests that the standard approach to conducting a test of endogeneity is to apply an IV approach (Foster, 1997; Clarke & Windmeijer, 2012). However, very few social capital studies have followed the IV approach, and none has followed the network-based individual-level measurement of social capital. We selected IVs based on the current and country contexts. Such an approach has not been extensively adopted for papers investigating the relationship between social capital and health. We selected three variables to use as an instrument: endline productive asset; number of people seeking help from women participants; and received invitations from non-relatives. Endline productive asset can influence the attractiveness of a person in social setting and improve their chance to create more social network. However, we argue that ownership of productive asset does not effect self reported health status of a person. Again number of people seeking help and invitation received can improve the opportunity to be introduced with new people and thus create more social

network. However these variable does not effect self reported health status of a person.

The results in Tables 13 and 14 indicate that all three IVs correlate with the composite measure of social capital but not with the covariate of self-reported health. We utilised an IV probit estimator to conduct three tests to check the endogeneity of our composite social capital indicator. Table 10 shows the result for the first-stage F-statistics, test for week instrument, Anderson Rubin confidence interval and the Amemiya–Lee–Newey overidentification test. Both of these suggest that the instruments (end-line productive asset, number of people seeking help from women participants, and received invitations from non-relatives) we used are not weak and are valid. We conducted the Durbin–Wu–Hausman test of the null hypothesis that our composite social capital index is exogenous. As Table 15 shows, we cannot reject the null hypothesis, which means our social capital index might not be endogenous.

5 Conclusion

In this paper, we have evaluated whether having more social capital is associated with better female health for those in extreme poverty, comparing control and treatment groups for women in BRAC's UPG programme. In our study, the treatment group received programme interventions such as enterprise development training, asset transfers, hands-on training through group meetings and home visits, savings matching, healthcare support and community resource mobilisation, while the control group received no interventions.

Our findings show a negative association between two measures (composite and diversity measures) of social capital and self-reported health among the sample control group. However, the relationship was positive among the sample treatment group, as we found a significant positive relationship between three measures (composite, upper reachability and diversity measures) of social capital and self-reported health. The composite measure of social capital had the highest impact, followed by the diversity and quality measure of social capital.

Our findings suggest that increased social capital does not always create good health outcomes. Creating and maintaining social capital may cause stress and an additional burden on extremely poor women, which might negatively affect their

health. Our policy suggestion is that just designing social capital interventions is not, in itself, adequate. It is also necessary to design and implement support interventions that will assist in creating a social network, reducing the cost of maintaining it and maximising its benefit so that the women can reap the rewards of social capital interventions.

We found that it was only the quality of social capital that was associated with better health outcomes for extremely poor women. This reinforces the idea that not every type of social capital is important for a specific outcome in a targeted population group. For example, having a connection with a lawyer or a businessman might help to create more social capital, but will not help ensure access to healthcare services or better health. Our second policy suggestion would be to focus on creating a social network that is closely related to providing health-related support as well as support services that facilitate the receiving of health services. For example, creating connections with healthcare professionals is required to get health support. It is also necessary to have a connection to receive different support services such as transport and childcare.

Adding further value to the literature, controlling for endogeneity, and even when we interpret the findings with a degree of caution, there appears to be a clear indication that social capital could have both positive and negative impacts on extremely poor women's health. Although further qualitative studies could be undertaken to determine the exact mechanisms underpinning this relationship, our research indicates that programme interventions seem to play an essential role in reducing the cost of creating networks, especially those that are health-specific, and in producing positive health outcomes.

Table 1: Sample size in baseline and endline

Category	Sample no: baseline (endline)
Treatment	2,854 (1305)
Control	1,347 (944)
Total sample	4,201 (2249)

Source: Author's own calculation.

Table 2: Matching summary

Details	Sample	
	Control	Treatment
Full sample	944	1,305
Matched	464	1,299
Unmatched	480	6
Discarded	0	0

Source: Author's own calculation.

Table 3: Measures of social capital indicators

Measure	Group 1		Group 2		Group 3		Full sample	
	Treatment	Control	Treatment	Control	Treatment	Control	Treatment	Control
Volume of social capital	438.15	359.89	527.47	395.22	502.59	421.71	512.65	404.87
Upper reachability	74.26	74.05	77.41	72.22	76.34	73.87	76.81	73.01
Range	57.15	52.20	59.54	53.36	58.16	54.92	58.84	53.98

Source: Author's own calculation from UPG dataset.

Table 4: Correlation matrix

Details	Total network size	Upper reachability	Range
Volume of social capital	1***	0.693***	0.727***
Upper reachability	0.69***	1***	0.904***
Range	0.727***	0.904***	1***

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

Source: Author's own calculation from UPG dataset.

Table 5: KMO and Bartlett's test

Kaiser–Meyer–Olkin measure of sampling adequacy.		0.702
Bartlett's test of sphericity	Approx chi-square	5539.318
	Df	3
	Sig	.000

Source: Author's own calculation from UPG dataset.

Table 6: Total variance explained

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
Component 1	2.553494	85.116459	85.116459	2.553494	85.116459	85.116459
Component 2	0.352048	11.734923	96.851382			
Component 3	0.094459	3.148618	100.000000			

Note: The extraction method used was principal component analysis.

Source: Author's own calculation from UPG dataset.

Table 7: Component matrix

Social capital indicators	Component 1
Volume of social capital	0.867764

Upper reachability	0.942732
Range	0.954848

Note: The extraction method used was principal component analysis; 1 component extracted.

Source: Author's own calculation from UPG dataset.

Table 8: Component score coefficient matrix

Social capital indicators	Component 1
Volume of social capital	0.339834
Upper reachability	0.369193
Range	0.373938

Note: The extraction method used was principal component analysis; the rotation method used was Varimax with Kaiser normalisation.

Source: Author's own calculation from UPG data set.

Table 9: Socioeconomic characteristics of participants

Participants' characteristics	Treatment	SD	Control	SD	Difference
Age	36.85	10.43	37.59	10.65	-0.74
Number of children	2.75	1.46	2.74	1.33	0.01
Married (yes=1; no=0)	86.14%		87.45%		-1.31%
Participants with long-term health issues (yes=1; no=0)	3.51%		5.12%		-1.6%
Per capita income (in BDT)	2,297.539	1,448.29	2,033.27	1,302.94	264.269***
Education					
No education	37.88%		43.26%		-5.38%**
Below primary	55.74%		49.73%		6.01%**
Primary	6.39%		7.01%		-0.62%
Secondary and above	0		0		0
Education of partner					

No education	41.42%	44.18%	-2.76%
Below primary	36.34%	34.87%	1.47%
Primary	6.7%	5.08%	1.62%
Secondary and above	0	0.31%	-0.31%**
Female-headed household (yes=1; no=0)	18.55%	18.94%	-0.39%
Household ownership of poultry (yes=1; no=0)	71.05%	55.04%	16.01%***
Household ownership of livestock (yes=1; no=0)	69.44%	49.5%	19.94%***
Household ownership of vehicle (yes=1; no=0)	15.47%	11.7%	3.77%**
Household ownership of mobile (yes=1; no=0)	89.76%	83.21%	6.55%**
Household ownership of productive asset (BDT)			
BDT 0–999	83.89%	76.75%	7.14%***
BDT 1,000–5,000	9.24%	14.01%	-4.77%***
Above BDT 5,000	6.93%	9.2%	-2.27%
Household ownership of land			
No land ownership	16.4%	30.49%	-14.09%***
0.1–5 decimal	30.02%	51.81%	-21.79%***
5 decimal and above	53.58%	17.71%	35.87%***
Households have savings			
No savings	25.01%	52.89%	-27.88%***
BDT 1–5,000	45.11%	27.41%	17.7%***
BDT 5,001–10,000	15.4%	8.24%	7.16%***
Above BDT 10,000	14.47%	11.47%	3%
Access to safe water (yes=1; no=0)	59.2%	51.89%	7.31%***
Access to sanitation (yes=1; no=0)	30.48%	23.87%	6.61%***

Family size	4.2	1.45	4.22	1.42	-0.02
Stress level					
High stress	33.71%		30.49%		3.22%
Low stress	66.28%		69.52%		-3.24%
Participant involved in household work (yes=1; no=0)	100%		100%		0.00%
Participant involved in outside work (yes=1; no=0)	67.51%		90.3%		-22.79%***
N	**1,299**		**464**		

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

Source: Author's calculation from UPG dataset.

Table 10: Frequency distribution of position generator items

Job	Group 1		Group 2		Group 3		Full sample		
	Treatment	Control	Treatment	Control	Treatment	Control	Treatment	Control	Difference
Tailor	68%	68%	90%	82%	88%	86%	88%	83%	5%***
Labourer	94%	83%	88%	87%	86%	85%	87%	86%	1%
Owner of retail grocery store	70%	65%	72%	63%	68%	62%	70%	63%	7%***
Manual rikshaw/van driver	71%	59%	69%	57%	69%	56%	69%	57%	12%***
School teacher	44%	33%	63%	55%	67%	58%	64%	55%	9%***
Member of local council	76%	81%	65%	55%	59%	54%	63%	56%	7%***
NGO field worker	30%	14%	65%	29%	62%	38%	62%	33%	29%***
Construction worker	51%	54%	58%	37%	51%	47%	55%	42%	13%***
Small/medium farmer	52%	51%	56%	39%	53%	40%	54%	40%	14%***

Religious leader	48%	51%	53%	48%	54%	45%	54%	47%	7%***
Doctor	44%	32%	47%	44%	45%	41%	46%	42%	4%**
Veterinary doctor	33%	2%	45%	31%	42%	35%	43%	31%	12%***
Health support worker	29%	25%	42%	36%	45%	37%	43%	36%	7%***
Security guard	38%	60%	45%	34%	35%	32%	41%	34%	7%***
Large farmer	35%	13%	34%	25%	33%	25%	34%	24%	10%***
Phone banking store	19%	11%	34%	24%	32%	29%	33%	26%	7%***
Barber	29%	17%	30%	27%	25%	23%	28%	25%	3%*
Salesman	30%	16%	29%	21%	26%	24%	28%	22%	6%***
Mechanic	17%	0%	24%	16%	25%	19%	24%	17%	7%***
Small agricultural trader	19%	30%	24%	17%	24%	15%	24%	17%	7%***
Motor car driver	14%	0%	22%	15%	23%	17%	22%	15%	7%***
Agricultural input seller	22%	10%	21%	19%	21%	15%	21%	17%	4%***
Member of political party	13%	11%	19%	10%	16%	16%	17%	12%	5%***
Veterinary support worker	10%	0%	17%	6%	13%	8%	15%	6%	9%***
Hawker	8%	8%	14%	10%	12%	12%	13%	11%	2%
Blacksmith	10%	0%	10%	10%	10%	5%	10%	7%	3%***
Lawyer's assistant	3%	5%	8%	4%	8%	5%	8%	5%	3%***
N	**63**	**27**	**682**	**278**	**554**	**279**	**1,299**	**464**	

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

Source: Author's calculation from UPG dataset.

Table 11: Binary logistic regression of social capital on the odds of good or bad self-rated health (control sample group)

Variables	Model 1	Model 2	Model 3	Model 4

	OR (95% CI)		OR (95% CI)		OR (95% CI)		OR (95% CI)	
Constant	4.557	(0.088–35.286)	8.969	(0.16–513.03)	8.018	(0.15–439.16)	3.474	(0.067–179.46)
Volume of social capital	0.999	(0.998–1.000)						
Upper reachability of social capital			0.989	(0.974–1.003)				
Diversity of social capital					0.987*	(0.975–1.000)		
Composite social capital Index							0.803*	(0.628–1.028)
Age	0.931	(0.808–1.074)	0.927	(0.805–1.067)	0.930	(0.807–1.072)	0.933	(0.809–1.075)
Age square	1.000	(0.999–1.002)	1.000	(0.999–1.002)	1.000	(0.999–1.002)	1.000	(0.999–1.002)
Number of children	1.007	(0.824–1.230)	1.006	(0.822–1.232)	1.003	(0.821–1.226)	1.007	(0.823–1.231)
Education								
Primary	0.485**	(0.256–0.913)	0.443**	(0.255–0.909)	0.488**	(0.256–0.910)	0.511**	(0.258–0.921)
Secondary	0.417	(0.140–1.246)	0.416	(0.139–1.240)	0.419	(0.141–1.250)	0.427	(0.143–1.273)
Sex of household head	1.398	(0.591–3.305)	1.366	(0.577–3.234)	1.342	(0.569–3.167)	1.353	(0.574–3.189)
Education of partner								
Primary	1.379	(0.777–2.447)	1.353	(0.760–2.409)	1.332	(0.748–2.370)	1.360	(0.766–2.415)
Secondary	0.726	(0.273–1.930)	0.745	(0.280–1.984)	0.694	(0.265–1.814)	0.721	(0.275–1.894)
Above secondary	3.170	(0.679–14.802)	3.155	(0.687–14.500)	3.099	(0.668–14.38)	3.118	(0.670–14.507)
Family composition	0.974	(0.795–1.192)	0.972	(0.792–1.194)	0.962	(0.783–1.183)	0.967	(0.788–1.187)
Per capita income	1.000*	(1.000–1.000)	1.000*	(1.000–1.000)	1.000*	(1.000–1.000)	1.000*	(1.000–1.000)

Household ownership of livestock	1.288	(0.800–2.073)	1.290	(0.805–2.070)	1.293	(0.807–2.073)	1.302	(0.811–2.090)
Household ownership of poultry	0.909	(0.564–1.464)	0.899	(0.557–1.452)	0.906	(0.561–1.464)	0.901	(0.558–1.455)
Household ownership of mobile	0.826	(0.364–1.873)	0.798	(0.3541.802)	0.843	(0.367–1.939)	0.821	(0.360–1.870)
Household ownership of vehicle	1.225	(0.626–2.398)	1.206	(0.613–2.370)	1.205	(0.615–2.361)	1.217	(0.621–2.383)
Household savings								
BDT 1–5000	0.586	(0.253–1.358)	0.587	(0.254–1.358)	0.573	(0.244–1.347)	0.575	(0.246–1.345)
BDT 5001–10000	0.497	(0.215–1.149)	0.501*	(0.217–1.140)	0.494*	(0.213–1.143)	0.498	(0.216–1.150)
Above BDT 1,000	0.778	(0.287–2.107)	0.824	(0.303–2.241)	0.799	(0.288–2.217)	0.798	(0.291–2.189)
Household ownership of land								
0.1-5 decimal	0.821	(0.408–1.654)	0.806	(0.400–1.625)	0.795	(0.391–1.616)	0.805	(0.397–1.630)
5 decimal and above	1.055	(0.566–1.967)	1.037	(0.558–1.927)	1.018	(0.546–1.898)	1.033	(0.554–1.925)
Access to safe water	1.250	(0.768–2.033)	1.251	(0.770–2.033)	1.243	(0.763–2.024)	1.255	(0.771–2.044)
Access to sanitation	1.461	(0.808–2.642)	1.448	(0.791–2.652)	1.430	(0.782–2.617)	1.432	(0.784–2.617)
Stress level	0.927	(0.551–1.560)	0.926	(0.551–1.557)	0.938	(0.555–1.583)	0.939	(0.557–1.582)
Marital status	2.983	(0.595–14.969)	3.011	(0.617–14.68)	2.918	(0.589–14.45)	2.928	(0.592–14.485)
NSCP vaccine	5.722**	(1.464–22.383)	5.612**	(1.447–22.055)	5.726**	(1.478–22.22)	5.546**	(1.430–21.705)
NSCP ANC	0.469	(0.112–1.971)	0.479	(0.114–2.011)	0.478	(0.113–2.021)	0.471	(0.112–1.981)

Notes: ***, **, * denote significance at the 1%, 5% and 10% levels, respectively. The references for the estimates above include education of participants (no education), education of partner (no education), sex of household head (male), household ownership of

livestock (yes=1), household ownership of poultry (yes=1), household ownership of mobile (yes=1), household ownership of vehicle (yes=1), household savings (no savings), household ownership of land (no land ownership), access to safe water (yes=1), access to sanitation (yes=1), stress level (high), marital status (widow/divorced/separated).
Source: Author's calculation from UPG dataset.

Table 12: Binary logistic regression of social capital on the odds of good or bad self-rated health (treatment sample group)

Variables	Model 1 OR (95% CI)		Model 2 OR (95% CI)		Model 3 OR (95% CI)		Model 4 OR (95% CI)	
Constant	1.114		0.641		0.713		1.270	
Volume of social capital	1.000	(1.000–1.001)						
Upper reachability of social capital			1.009**	(1.001–1.017)				
Diversity of social capital					1.010***	(1.003–1.017)		
Composite social capital index							1.145**	(1.012–1.296)
Age	0.959	(0.886–1.038)	0.958	(0.885–1.036)	0.957	(0.884–1.035)	0.957	(0.883–1.034)
Age square	1.000	(0.999–1.001)	1.000	(0.999–1.001)	1.000	(0.999–1.001)	1.000	(0.999–1.001)
Number of children	0.901*	(0.812–1.001)	0.901*	(0.811–1.001)	0.903*	(0.812–1.002)	0.902*	(0.813–1.002)
Education								
Primary	1.119	(0.653–1.917)	1.124	(0.656–1.924)	1.132	(0.660–1.940)	1.132	(0.661–1.940)
Secondary	0.829	(0.511–1.346)	0.830	(0.511–1.348)	0.836	(0.514–1.358)	.836	(0.513–1.354)
Sex of household head	0.913	(0.588–1.418)	0.914	(0.589–1.425)	0.925	(0.593–1.432)	0.922	(0.593–1.429)
Partner education								
Primary	1.053	(0.422–2.629)	1.070	(0.428–2.689)	1.064	(0.425–2.652)	1.061	(0.423–2.641)

Secondary	1.162	(0.463–2.914)	1.178	(0.468–2.965)	1.171	(0.466–2.943)	1.171	(0.464–2.929)
Above secondary	0.818	(0.299–2.235)	0.823	(0.300–2.265)	0.812	(0.295–2.215)	0.809	(0.297–2.222)
Family composition	1.061	(0.958–1.176)	1.064	(0.960–1.178)	1.062	(0.960–1.179)	1.064	(0.959–1.178)
Per capita income	1.000	(1.000–1.000)	1.000	(1.000–1.000)	1.000	(1.000–1.000)	1.000	(1.000–1.000)
Household ownership of livestock	0.921	(0.714–1.186)	0.930	(0.721–1.197)	0.935	(0.729–1.214)	0.940	(0.723–1.204)
Household ownership of poultry	1.199	(0.924–1.555)	1.199	(0.924–1.555)	1.195	(0.922–1.554)	1.197	(0.922–1.552)
Household ownership of mobile	1.082	(0.717–1.635)	1.085	(0.718–1.639)	1.104	(0.730–1.669)	1.104	(0.725–1.656)
Household ownership of vehicle	1.230	(0.891–1.700)	1.255	(0.907–1.737)	1.273	(0.919–1.760)	1.272	(0.908–1.736)
Household savings								
BDT 1–5000	1.047	(0.707–1.551)	1.050	(0.709–1.560)	1.059	(0.713–1.564)	1.056	(0.716–1.571)
BDT 5,001–10,000	1.086	(0.764–1.545)	1.086	(0.764–1.547)	1.089	(0.764–1.545)	1.087	(0.768–1.553)
Above BDT 10,000	0.908	(0.599–1.375)	0.917	(0.605–1.391)	0.914	(0.603–1.385)	0.914	(0.603–1.385)
Household land ownership								

0.1–5 decimal	1.277	(0.887–1.839)	1.278	(0.887–1.833)	1.282	(0.895–1.859)	1.290	(0.890–1.847)
5 decimal and above	1.210	(0.868–1.686)	1.224	(0.878–1.708)	1.231	(0.882–1.717)	1.231	(0.877–1.706)
Access to safe water	0.763**	(0.603–0.967)	0.774**	(0.611–0.983)	0.778**	(0.613–0.986)	0.777**	(0.610–0.980)
Access to sanitation	0.877	(0.683–1.126)	0.868	(0.676–1.117)	0.870	(0.676–1.116)	0.869	(0.678–1.119)
Stress level	1.785***	(1.391–2.290)	1.779***	(1.386–2.278)	1.781***	(1.391–2.293)	1.786***	(1.390–2.290)
Marital status	1.077	(0.417–2.778)	1.080	(0.418–2.816)	1.083	(0.417–2.784)	1.077	(0.416–2.779)
NSCP vaccine	2.848***	(1.536–5.280)	2.820***	(1.528–5.176)	2.821***	(1.538–5.238)	2.838***	(1.563–5.337)
NSCP ANC	0.625	(0.315–1.242)	0.624	(0.315–1.242)	0.611	(0.307–1.207)	0.608	(0.308–1.211)

Notes: ***, **, * denote significance at the 1%, 5% and 10% levels, respectively. The references for the estimates above include education of participants (no education), education of partner (no education), sex of household head (male), household ownership of livestock (yes=1), household ownership of poultry (yes=1), household ownership of mobile (yes=1), household ownership of vehicle (yes=1), household savings (no savings), household ownership of land (no land ownership), access to safe water (yes=1), access to sanitation (yes=1), stress level (high), marital status (widow/divorced/separated).

Source: Author's calculation from UPG dataset.

Table 13: Regression results for independent variables and self-reported health

Variable list	Treatment sample				Control sample			
	Total network size	Upper reachability	Range	Composite index	Total network size	Upper reachability	Range	Composite index
Participant age	0.034	-0.009	0.012	0.012	-0.013	0.053	0.023	0.023
Age square	0.012	-0.022	-0.001	-0.005	-0.042	0.034	0.000	-0.002
Number of children	0.006	-0.013	-0.003	-0.004	0.002	0.043	0.014	0.022
Education of participant	.061*	0.054	0.045	.058*	0.080	0.038	0.037	0.055
Sex of household head	0.021	0.012	0.013	0.016	0.041	0.088	0.053	0.066
Age of household head	0.023	-0.013	0.004	0.004	0.003	0.063	0.043	0.040
Education of partner	-0.011	0.001	-0.004	-0.005	-0.039	0.019	-0.01	-0.010
Family size	0.052	0.019	0.028	0.035	0.030	-0.026	-0.03	-0.010
Income	.071*	.065*	0.050	.067*	.131**	.137**	.125**	.141**
Access to safe water	.064*	.095**	.094**	.092**	.129**	.091*	0.066	.101*
Access to sanitation	0.023	-0.019	-0.009	-0.003	-0.045	-0.059	-0.07	-0.061
Stress level	0.016	-0.017	-0.004	-0.003	0.018	0.001	0.014	0.012
Marital status	0.002	0.005	0.001	0.003	-0.045	0.022	0.007	-0.005
NSCP vaccine	-.130**	-0.043	-0.036	-.073**	-.119*	-0.090	-0.08	-.101*
NSCP ANC	.099**	.059*	.079**	.085**	0.083	0.039	0.071	0.068

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

Source: Author's calculation from UPG dataset.

Table 14: Test of validity of instruments for composite social capital index

Model	Composite social capital index			Self-reported health		
	B	Std error	Sig	B	Std error	Sig
(Constant)	-1.975	0.405	0.000	0.868	0.205	0.000
Endline productive asset	2.913	0.000	0.000	-.000006	0.000	0.824
Number of people came to seek help	0.020	0.006	0.001	0.002	0.003	0.490
Got an invitation from non-relative	0.312	0.062	0.000	0.033	0.031	0.287
Participant age	0.054	0.018	0.003	-0.015	0.009	0.097
Age square	-0.001	0.000	0.011	0.000	0.000	0.229
Number of children	-0.049	0.025	0.047	-0.034	0.013	0.007
Education	0.098	0.054	0.069	-0.043	0.027	0.113
Sex of household head	0.138	0.104	0.185	0.031	0.053	0.551
Age of household head	0.000	0.004	0.904	0.000	0.002	0.806
Education of partner	0.000	0.000	0.536	8.485	0.000	0.382
Family composition	0.043	0.028	0.132	0.028	0.014	0.052
Per capita income	1.469	0.000	0.452	1.738	0.000	0.860
Access to safe water	0.166	0.055	0.003	0.063	0.028	0.024
Access to sanitation	-0.085	0.059	0.145	0.024	0.030	0.422
Stress level	-0.030	0.058	0.605	-0.136	0.029	0.000
Marital status	0.076	0.087	0.385	-0.032	0.044	0.468
NSCP vaccine	-0.394	0.143	0.006	0.233	0.072	0.001
NSCP ANC	0.522	0.160	0.001	-0.119	0.081	0.141

Source: Author's calculation from UPG dataset.

Table 15: Robustness check

IV test	Outcome variable: self-reported health
Anderson Rubin confidence interval	0.09833 - 0.4284
Weak instruments	0.000***
Amemiya–Lee–Newey minimum chi-sq statistic	0.821
Amemiya–Lee–Newey minimum p value	0.6633
First stage F-statistics	18.752
Stock–Yogo 5%/10% bias	9.08
Endogeneity stat – chi-sq	0.35
Endogeneity – P value	0.5523

Source: Author's calculation from UPG dataset.

Annexe A: Position generator tool used for this study

Do you know someone from the following occupations? As a criterion of 'knowing' a person, imagine that, when you accidentally meet on the street, you would know the name of that person and both could start a conversation with each other.

Table A1: Position generator tool

Job position	**Do you know someone?** **Yes: 1** **No: 0**	**If yes, Is s/he** **Relative: 1;** **Friend/neighbour: 2;** **acquaintance: 3**
NGO field worker		
Member of the local council		
Owner of the retail grocery store		
Health support worker		
Veterinary doctor		
Doctor		
School teacher		
Lawyer's assistant		
Religious leader		
Veterinary support worker		
Hawker		
Small agricultural trader		
Barber		
Salesman		
Small/medium farmer		
Large farmer		
Construction worker		
Blacksmith		
Mechanic		
Tailor		
Motor car driver		
Labourer		
Security guard		
Member of a political party		
Phone banking store		
Manual rikshaw/van driver		

Agricultural input seller		

Annexe B: Selection criteria

To be selected, a household must fulfil criteria 1–3. In addition, it will have to fulfil two or three of the criteria 4–7 (if there is any member with a critical illness, then three criteria; if there is no household member without a critical illness, then two criteria).

Table B1: Selection criteria of participants

Sl	Indicator	Group 1	Group 2	Group 3
1	Per capita daily income	$1.90 at PPP exchange rate	$1.90 at PPP exchange rate	$1.90 at PPP exchange rate
2	Age group	Above 50 years	16–50 years	16–50 years
3	NGO membership	No NGO membership	No NGO membership	No NGO membership
4	Regularity of income	Irregular	Irregular	Irregular
5	Productive assets	BDT 5,000	BDT 5,000	BDT 10,000
6	Land ownership	Ten decimals	Ten decimals	30 decimals
7	Health status	One/multiple HH members are critically ill	One/multiple HH members are critically ill	One/multiple HH members are critically ill

Annexe C: Programme components

The support packages offered by the programme include the following elements.

A. Enterprise development training;
B. Asset transfer;
C. Hands-on training through group meetings and home visits;
D. Savings matching;
E. Healthcare support;
F. Community resource mobilisation.

A brief description of these components is provided below.

Enterprise development training

After being selected for the programme, participants select an enterprise. Issues considered for enterprise selection include the household's surroundings, prior experience of managing an enterprise, the geographical setup in which the beneficiary lives, the physical condition of the household members, availability of necessary relevant services in the locality, and the scope of marketing outputs. In addition, programme staff discuss several issues with household members, such as potential financial return, cost of maintaining the enterprise, technical skills required and payback amount.

After the selection of an enterprise, programme participants receive specific enterprise-based training. The training usually lasts for three days, with around 25 participants in each batch. This training aims to build technical skills, develop a business strategy, teach participants how to take care of their enterprise, build confidence and prepare them for the future. After the initial training, programme participants receive seven days of refresher training during the two-year programme lifecycle.

Asset transfer

After receiving the enterprise development training, the participants receive pre-selected assets. Programme staff either directly purchase the asset for the participants or assist them in buying it. The total value of the asset ranges from BDT 12,000 to BDT 18,000. Depending on the type of asset, Group 2 participants have to return 30% to 50% of their asset value. On the other hand, Group 3 participants have to return the full value of their assets. Group 1 participants received full asset value as grant.

Hands-on training through group and home visits

Each programme participant has to attend a bi-weekly group meeting and a home visit. The purpose of these meetings is to provide them with hands-on training. Group meetings are usually arranged to provide financial literacy. The purpose of home visits is to provide social awareness messages and health awareness information, and to discuss any personal issues.

Savings matching

The purpose of this programme component is to encourage the participants to save, and to help them build financial resilience. After joining the programme, participants must open a savings account with BRAC. Programme staff regularly provide savings-related messages and encourage them to save. In addition, to build future financial resilience and encourage them to save, the programme provides savings-matching support to all the participants. Under this scheme, at the end of each month, the programme deposits double the amount of money the participant saved that month. The maximum savings matching support for each participant is BDT 200 per month. In this way, through the full programme duration, a participant can receive a maximum of BDT 3,000 as savings-matching support. The programme participants can use these savings to meet any sudden emergency or may invest it to buy additional assets.

Healthcare

The programme provides healthcare support through this component. The usual health support includes connecting participants with local health centres or hospitals. In addition, programme staff also conduct regular activities to create health awareness among participants.

Community mobilisation

This programme component aims to create a vertical linkage between programme participants and upper segments of the local community. The programme people help to form a village community committee with representatives from local elites. All the participants in the surrounding areas become members of the committee. The committee usually holds monthly meetings where the problems and needs of the participants are discussed. Committee members try to raise community resources to help extremely poor participants. In addition, the committee works as a platform to create a new social network and gain social capital for the participants.

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