Final report

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As you sow, so you reap! Assessing a Mandatory Employer-Sponsored Health Insurance Scheme

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Abstract

In this study, we have aimed to evaluate a health insurance scheme. The scheme was offered and managed by a large not-for-profit employer, which acts as the supplier for one of the leading local brands in Bangladesh. The scheme provided limited coverage for primarily in-patient hospitalization care to the existing regular female workers in rural areas of Bangladesh. The scheme is largely covered by the premium paid equally by the workers and the employer. The randomized evaluation reveals only a modest out-of-pocket saving. However, we find significant changes in health seeking behaviors that are consistent with the designs of the scheme. The evaluation suggests a higher coverage that may allow significant OOP savings and policymakers also need to consider the behavioral change emanating from participating in health insurance scheme.

Key words: Health Insurance, Health Seeking Behavior, Out-of-pocket Savings.

JEL Classifications: H51, H75, I1

1 Introduction

In this study, using an experimental design, we aim to learn from a mandatory employer-based health security scheme whether it can contribute towards lowering direct (out of pocket) payment for health care and incentivizing access to health care utilization. Recently, universal health coverage (UHC) has garnered much attention and the role of financial coverage for health care services through prepayment (for example, through a tax backed system or private insurance) have also been pointed out as an important component for providing UHC for the vast majority of the global population (WHO 2010). While most of the developed and several of the middle-income countries have state-mandated mass health insurance scheme, most countries lack comprehensive coverage for the health care cost for their citizens. In absence of a pre-paid risk-pooling mechanism, regardless of socio-income status, most people rely on out-of-pocket payments or borrowing from one's friends, family members and moneylenders to meet the health care needs (Townsend 1994, Fafchamps and Lund 2003). Risk-pooling through pre-payment or premiums is not very common and households essentially self-insure themselves subject to financial support available from informal sources. This is especially burdensome for the world's 1.3 billion poor who may have no access to health care services because of the liquidity constraint imposed by their socio-economic status (Preker, Carrin, et al., 2002, Xu, et al. 2003).

Typically, in the countries where insurance coverage is substantial, the government plays important roles in providing households with the access to such insurance (REFERENCE). The risk pooling typically take place through tax-based system allowing consumers to supplement the basic coverage with private insurance scheme, if necessary. However, even in tax based system, the state as a provider may face constraint and it is not uncommon for people to remain out of reach of the health insurance scheme (Finkelstein, et al. 2012). Even in the developed countries, extending the health insurance coverage can lead to more health care usage and raising cost while lowering out-of-pocket payment of the beneficiaries, which is the main aim of the health insurance scheme in the first place. There have been few large evaluations of extending health insurance to uncovered population and contributed to our understanding on how health

insurance can have impacts on health care utilization and savings (see, for example, Manning, et al. 1987, Newhouse and the Insurance Experiment Group 1993).[1]

In the developing countries, an effective health insurance system can play a vital role in protecting the household from the financial risks associated with health care expenditures by pooling costs overtime through prepayment and over individuals by pooling risk. Households primarily depend on informal networks of friends, family members, neighbors and even moneylenders for unforeseen financial needs emanating from health shock (Fafchamps and Lund 2003). However, such risk sharing remains incomplete resulting in income and consumption volatility, asset depletion and welfare loss (Townsend 1994). Hence, provision of health insurance and financial security through pooling households' financial resources along with government or employer's contribution can be expected to increase workers' welfare, avoid loss of savings, and perhaps raise productivity as well.

Recently, there have been a number of evaluations of health insurance in low and middle income countries. While evaluations addressing the selection issues explicitly and appropriately (through random assignment or quasi-experimental protocol) are few and far between, there is a steadily growing literature on demand and impacts of health insurance products among lower income households (Acharya, et al. 2013). The lessons from the prior studies are quite mixed. Voluntary health insurance schemes are typically characterized by low uptake, high turnover and insignificant impact on health care utilization. For example, Gnawali, et al. (2009) have found outpatient services increasing among the enrolled beneficiaries compared with the households have not enrolled without any significant differences in outpatient services (that usually have a higher financial burden among the households. Similarly, using a RCT, Raza, et al. (2015) have also found, no sizable impacts on access and financial protection among the beneficiaries. While social health insurance can lower total health care expenditure and substitute use of providers who are covered under the program (a result that we will also replicate here),

[1] RAND's health insurance experiment remains one of the largest and most comprehensive experimental evaluations of health insurance scheme in the literature. The results have later been analyzed in more

total premium surpasses total savings and overall health utilization does not change (Thornton, et al. 2010).[2]

It is important to note that selection plays important role in determining the impacts of health insurance schemes. Adverse selection into the program (more risky beneficiaries choosing purposefully to take part in the program) is a valid concern. Community provided health care financing schemes often entice limited demand, making them ineffective in pooling risk over a large client base besides being prone to adverse selection (Acharya, et al. 2013). The insurance take-ups often remain low with inadequate willingness-to-pay, which is unlikely to cover the health care costs of the beneficiaries in a significant way.[3]

Majority of the labor force in Bangladesh is employed in the semi-formal and informal sector, thus limiting the opportunity to bring them under health insurance coverage because of high transaction cost. Considering the limitations of a voluntary model, compulsory co-payment based health insurance schemes can provide financial support for better health outcomes without the risk of further impoverishment. In this study, we aim to evaluate and understand one such example of employer administered health insurance or Health Security Scheme (HSS)[4] at a large non-profit enterprise which organizes, trains, and supports rural women to overcome poverty through providing employment opportunities. The scheme is mandatory for all the eligible workers paid through a piece rate system, popularly known as "artisans" with the monthly premium shared equally by the artisan and the employer.

[2] Access to health insurance scheme can have major impacts on economic outcomes in additional margins such as asset accumulation and savings generation (see, for example, Chou, Liu and Hammitt 2003, Levine, Polimeni and Ramage 2016).

[3] For some recent estimates on willingness-to-pay for health insurance among informal sector workers in Bangladesh, please see Ahmed, et al. (2016). The studies assessing impacts of access to health insurance are also often prone to modest demand among the consumers who are offered with such products. While in the very short run enrolment can reach half of the targeted beneficiaries, the rention rate remains very low and enrolees drop off from the program (Levine, Polimeni and Ramage 2016). An earlier work by Thornton, et al. (2010) also finds a demand of only 20 percent among the clients who were offered an insurance product.

[4] One should note that technically only formal insurance companies could offer insurance products to any consumers as per law. Hence, the intervention cannot be termed as an insurance product. However, for all practical purpose, the program is designed as an insurance scheme and we will use the term accordingly.

This study aims to understand the effects of HSS on the semi-skilled workers through a randomized control trial where a random set of clusters of sub-centers are selected by the researchers in collaboration with the implementation partner. Given that the artisans are selected randomly to take part in the scheme, we have to worry less about selection and any difference in outcomes of interest can potentially be interpreted as causal impacts of the program. We focus on the causal association of HSS with changes in the pattern of health care seeking behavior, service utilization rates, total and out-of-pocket spending in case of diverse health events and type of health service providers consulted. We further look at mental health outcome such as anxiety and depression that can also alter because of access to the insurance scheme.

2 Description of the Context and the Program

2.1 Short Description of the Implementing Partner

We have partnered with a large not-for-profit organization that supplies products for one of the leading local brand in Bangladesh. The products include handicraft and fashion items. The fundamental purpose of the organization is to create a positive social impact by providing income opportunities primarily to rural women. The producing organization is an independent supplier selling the products through one of the leading local brands and the surplus is channeled through an owner NGO for various development activities. The supplier maintains a roster of 35 thousand women workers or artisans (of which about 20 thousand work at any given point of time), many of who come from disadvantaged and underprivileged backgrounds. Established in the early eighties, the foundation is dedicated to empower these female artisans and bring positive changes in their lives.

The female artisans are usually work in small clusters of about 25 artisans known as sub-centers, which are located in 12 different districts in Bangladesh. It recruits semi-skilled and untrained artisans from various rural areas, provides technical assistance by hiring skilled craftsmen and employs those village women into their sub-centers serving as production hubs. The enterprise gives the opportunity to involve these marginalized women in a sustainable environment.

2.2 Short Description of the Program

The mandatory health insurance scheme or health security scheme (HSS) for the informal sector workers of the abovementioned fashion chain works as a mechanism to generate financial resources for meeting the needs of large health expenses with an aim to reduce health related cost associated to shocks and vulnerability. The scheme initially started as a pilot at two foundations (Manikganj and Nilphamari) and extended to another foundation (Kushtia, a western district in Bangladesh) after running for eight months.

The Health Security Fund is financed through joint and mandatory contributions from employer and employees of the foundation. The premiums are paid monthly and are set at the individual level where a specific amount is deducted from the artisan's salary and the enterprise provides an equal amount. According to the eligibility criteria, maximum four persons who reside in the same household as the artisan can be covered under the scheme conditional on the relationship status of the artisan.

At present, in-patient facilities can be rendered from some specific government and private hospitals. Each artisan can obtain two payments annually for the entire household. Figure 1 provides the details of the benefit package. The beneficiaries can receive one thousand taka for some immediate needs covering emergency cases, normal delivery and minor surgical needs. Moreover, the beneficiaries can receive BDT 5,000 for caesarian section and up to BDT 10,000 for an inpatient service involving a surgery and can also receive BDT 2,000 for a non-surgical hospitalization. The scheme covers up to five members of an artisan household like the husband and up to three unmarried children under 18 years of age. For unmarried or previously married artisan, parents and up to two unmarried children can receive the coverage. Each beneficiary artisan is required to pay a premium of 25 taka with an additional 25 taka premium is paid by the employer.

2.3 Utilization Information from the Administrative Claim Data

For profiling the overall scenario of insurance utilization, we have retrieved administrative claim data of all three foundations where the scheme is currently offered. Using the administrative profile of claims of hospitalization of the past six months, we have used two approaches to assess health care utilization. First, we look at the person in the household who claimed against total number of insurance claims and total amount

reimbursed respectively. Secondly, for each different type of cases of in-patient admission, we calculated number of claims and monetary amount linked with that.

An important perspective from the performance of insurance utilization is that, though Kushtia started operating the scheme eight months later, compared to the other foundations, the number of claims is generally higher and so is total reimbursement When focusing on illness type and payment, most hospital admission is due to medical reason, but surgery has exhibited the highest percentage of reimbursement in Kushtia and Manikganj, in contrast to Nilphamari where medical payment has the highest share. It is also important to note that caesarean incidence is higher compared to normal deliveries in both Kushtia and Manikganj. There is an overall transparency across timely payment and reimbursement methods, cross-checking measures to validate the claims made. So, all these evidence suggest that including Kushtia under the health security fund follow utilization both through increasing claim and disbursement, resulting into a critical but successful approach to deliver a modest health coverage for all working under the foundation.

3 Research Methodology

3.1 Study approach

To understand the potential impacts of the health insurance scheme, we will primarily use data from two sources and use the information from the two sources in three ways. Firstly, as we have shown previously, we use administrative claim information to understand the level of utilization. Secondly, we match the administrative claim data with the household survey information. While administrative claim data allow us to understand the actual utilization, the claim data lack the total health care expenditure. Hence, by putting these two together we can understand the benefit intensity of the program, so to speak. Thirdly, and perhaps most importantly, we take advantage of an experimental design to understand the impacts of the health insurance scheme on selected outcomes of interest. We primarily look at health care utilization (overall and in-patient) and expenditure (total and net out-of-pocket after factoring in the scheme's contribution. Health security scheme aims to improve access to formal, facility-based in-patient care in

a setting where workers face hardship financing of out-of-pocket expenditure for health care expenditure.

3.2 Study Site

The partner organization for this project works through 13 "foundations" in different districts in Bangladesh. At the onset of this study, the PO already had the program in two foundations. After thorough consultation, PO decided to introduce the program to a foundation, which previously did not have the program (see Figure 2 for the time-line of the project). This foundation, located in the western district of Kushtia, was chosen purposefully allowing enough number of sub-centers required to maintain a minimum sample size of 50 clusters. Initially, there were a total of 84 sub-centres of which 14 closed afterwards. This study site allowed minimum number of sub-centres that were required to ensure enough statistical power of the trial. The partner organization introduced the scheme to 25 sub-centers (the "treatment" sub-centers) while the program was delayed by six months in the "control" sub-centers chosen randomly by the research team using a software based random number generator (see Figure 3).[5]

3.3 Sampling Strategy

To identify the potential impacts of providing the health insurance scheme, we relied on between clusters (as defined by the sub-center) variation in participation into the program. The power calculations with 80 percent power and five percent level of significance and 20 individuals with a reasonable level of intracluster correlation, we found that we needed about 24 clusters in each of the treatment arms. We chose to work with 50 sub-centers at the new foundation in Kushtia where the employer was planning to introduce the scheme.

The PO left it up to the researchers to choose the sub-centers for the study and we randomly chose 50 sub-centers from 64 sub-centers that were active at the onset of the project. Using further the random number generator in Stata™, we assigned 25 sub-centers into the treatment arm where health insurance scheme was introduced from the very beginning. The treatment group had access to the health security scheme from

[5] For geographical locations of the sub-centers (the mains units of interventions), please see Figure 4.

October, 2015 onward while the other half (control group) brought under HSS coverage six months afterwards (as also evident from Figure 2) allowing us a six-month window to understand the potential impacts of the scheme. The non-study sub-centers received the benefits under the scheme along with the treatment sub-center.

3.4 Data collection tools

The study has employed both quantitative and qualitative methods. We use structured questionnaire to collect artisan and household level information including overall socioeconomic, demographic, illness status both at the baseline and endline (see Figure 2). The surveys are identical except additional questions regarding the intervention, program specific knowledge in the end line. Information learned from the initial end line survey helped to develop guideline for qualitative study, which helped to understand the process of the intervention and beneficiary artisan's prospective on the program and possible effects.

The tools developed for baseline and end-line survey were pretested using quantitative methods. We have used the Android platform OpenDataKit (ODK) Collect to ensure timely data collection. All surveys were conducted using Android tabs, which enabled us to acquire all data immediately. Quality of the data source is ensured, starting with the training of the interviewers, direct field supervision and ending with proper documentation and electric preservation in the database.

3.5 Data Collection

At the base line, we have collected a total of 1,087 artisans (531 in treatment, 556 in control) representing information of 4,719 household members during September and October, 2015. Approximately six months after the health security scheme was launched, we administer the end line throughout March and April: 1,144 artisans (552 in treatment, 592 in control) covering 5,015 household members underwent the interview of which 115 artisans were new who joined on after the baseline survey. Additionally, in-between the months of October-March; 134 members were new to the household in terms of marriage, birth and joint household whereas 50 members left the household and 10 individuals were dead.

However, in the follow up survey 59 out of the original 1,087 artisans could not be interviewed. The rate of attrition between October, 2015 to March, 2016 was 4.0 percent (N=22) for the control group and 7.0 percent (N=37) in the treatment group at the individual level leading to a total attrition rate of 5.4 percent. The plausibility of outcomes being affected by attrition differential is low as the rates of loss to follow up are very low in each group.

Despite the initial number of control sub centers being 25, we were able to study 21 sub centers; 4 centers closed down as per management decision of the implementing partner. As our analysis primarily relies on intent-to-treat protocol (Glennerster and Takavarasha 2013), we ensured tracking down and surveying those previously employed artisans as long as they did not migrate outside their union.

3.6 Outcomes of Interest

The survey collected information separately for each member of the households in the sample which are provided by the artisan. To estimate the impact of HSS, the main outcome variables of interest related are following:

Health care seeking behavior and service utilization: A set of questions related to symptoms, length of illness and use of regular medicine were asked to identify illness in the household. Detailed information on health care utilization conditional on illness in 6 months preceding the survey was collected for outpatient and inpatient care. In-patient care reflected cases with stays in hospital at night and number of admissions where only consulting healthcare practitioner was considered under out patient care.

Health-care Expenditure: Both in baseline and end line survey respondents were asked to estimate total medical expenditure for each member who fell sick in the past six months preceding the survey. Household reporting healthcare cost was also queried about their source of financing including (i.e. current income, savings. selling assets, friends, bank. relatives, microfinance etc.) to pay for healthcare. Also, in depth information on health care costs (visits to doctor, consultation fees, costs of medicine, diagnostic fees, transportation cost) along with the out of pocket expenditures for each cost that occurred were collected in a manner in which a household finances costs for both outpatient and inpatient care separately.

Mental health: With a hope that HSS coverage should provide a reflection in the mental well-being of treatment group compared to control participants. As a result, standard questions on anxiety and depression were asked following GAD-7 and PHQ-9 questionnaires to realize their mental health status (Spitzer, et al. 2006, Kroenke and Spitzer 2002).

In addition to these outcome variables the survey questionnaire gathered information on a range of demographic (age/gender indicators, household size) socioeconomic (educational attainment, occupational status, household income) indicators. For obtaining household overall expenditure, questions on weekly, monthly and yearly expenses were asked. Along with that an asset index was developed as proxy for socioeconomic status by performing a principal component analysis (PCA). For the treatment group, a set of questions regarding awareness and knowledge of the HSS program were asked while the beneficiary answered a range of questions regarding their contentment after availing HSS.

3.7 Analytical Technique and Identification

We focus on the intent-to-treat analysis as it preserves all the randomized sub-centers according to randomized treatment assignment along with measuring outcome data on all participants regardless of the intervention and subsequent withdrawal. Using sub-centers as unit of intervention and artisans along with their households as unit of observation; for both baseline and end line outcome variables we use cluster RCT by clustering at the sub-center level. To assess the impact of HSS we use the following model

$$y_i = \alpha + \beta T_i + \Gamma X_i + \varepsilon_i$$

where, the key variable if interest is T_i which takes the value 1 if the i-th artisan is under the coverage of HSS for the past six months and 0 otherwise. We include some time-invariant covariates (X_i) to control for observable factors to enhance the precision of the treatment effect estimate. Hence, the coefficient β will measure the impact of HSS and allow us to estimate the intent-to-treat (ITT) treatment effects.

3.8 Ethical Clearance

We have received research approval from the "Ethical Review Committee" housed at James P Grant School of Public Health, BRAC University for conducting research on human subjects who fall under the purview of the researcher project. The research team has obtained written informed consent from all the survey participants for both the baseline and end line surveys. Researchers also took verbal consent from the participants and informed them about the use of a recording device for the purpose of in-depth interviews. The participants had the option to decline or withdraw their participation at any time of the interview. The respondents have not received any compensation to take part in the survey. All the personal identification information has been dealt with utmost care and privacy. The trial has been registered at American Economic Association's Social Trial Registry; please see Rabbani and Sarker (2015) for further details.

4 Findings

4.1 Socio demographic characteristic of the sample

We report the baseline characteristics of our sample in Table 1. We had a total sample size of 1,087 artisans. During the baseline four sub-centers have closed down but we have collected information of the artisans who were on the roster of these sub-centers at the time of the closing.[6] The average age of the artisans is about 31 years (with a standard deviation [SD] of 9 years). The majority of the artisans are married (about 81 percent). The artisans have average years of schooling of about 6.1 years (with a SD of 3.7 years). The average years of schooling is higher than adult women for Bangladesh suggesting some selection is taking place when the artisans choose to work for the firm. The average monthly income for the artisan is about 1,028 taka (with a SD of about 587 taka).

We further look at some household characteristics of the artisans. About 40 percent of the artisans and their households shared toilet with some other family or household. About 65 percent of the household have TVs. About 42% of the houses have cement floors (a determinant of higher income status in the rural Bangladesh with an average number of rooms of 2.2. Only about 37 percent of the households have an account at any

[6] Since then, at the time of preparing this report, the implementing partner has decided to open these sub-centers again.

of the commercial banks suggesting modest access to finance for these households. The average household size for our sample is 4.3, and about 65 percent of the households have a savings account (most of which are provided by microfinance institutions or MFIs). All in all these households present a socioeconomic status, which is better than an average rural household (if one compares our sample with more nationally representative rural sample, see BBS 2011).

4.2 Balance Test and Attrition

We, next, test the balance in our sample and assess the integrity of the randomized control trial. We present the results in Table 4. We carry out the balance test in two ways. We simply compare the mean values of different artisan and household characteristics between the control and the treatment groups. The results of the statistical tests are reported in Column (3) of Table 4. We further predict the treatment assignment using a simple binary outcome model and report the p-values for all the coefficients in Column (4).

The simple mean comparisons show that most of the variables do not exhibit any statistical differences between the two groups (e.g. age, marital status, whether the households share latrine). The households are also very similar in terms of whether households have access to finance (as measured by access to a bank account or whether they have savings or not). However, the artisans in the treatment group have a higher level of education and also earn more per month. There are also statistically significant difference in terms of whether the households have cement floor or not, access to a TV and also household size, however, the magnitudes are quite small. In the multivariate analyses, we find a weaker evidence of differences between the two groups as, except for the monthly income of the artisans, none of the individual artisan and household characteristics can statistically determine the treatment status (as suggested by the p-values reported in Column (4), see Table 4). However, in all the analyses we will include the time invariant household characteristics and baseline values as controls.

We have lost some respondents in the follow up (primarily because of migration). We use the baseline characteristics to see if there is any difference between the households who are lost to follow up and we also use a multivariate model to predict the attrition

outcome. The results are presented in Appendix Table 1. For both simple mean comparisons in Column (3) and multivariate analyses in Column (4)[7], we do not find any systematic attrition patterns. We carried out some further analyses of attritions by focusing on whether there are differences between the respondents who are interviewed either only in baseline or follow up survey. The results are presented in Appendix Table 2. We do not find any systematic differences in different groups. We carry out the standard ITT analyses as suggested before but we include the artisan and household covariates as controls in all our analyses.

4.3 Coverage, Claims and Health Care Expenditure

As of April, 2016, on average 561 artisans from treatment group along with their family of four were covered and eligible to use the scheme where the coverage access is limited to selected inpatient facilities. To evaluate how much the health "insurance" has affected aggregate level of health spending among those treatment households, we use the health spending data collected in the end line and combined overall health spending. The most salient finding from this analysis is that total disbursement from the insurance scheme had a little impact on overall health payments as it offered less coverage in monetary terms. Our calculation of total expenses for health care shows that only around 15% of the total in patient and 6% of the total health (both in-patient and out-patient) expenditure were covered under this employer-sponsored health coverage (Table 2). So, the fraction of insurance coverage is so small compared to the overall healthcare spending that we are unable to conclude that the very presence of the health security fund affords to cover artisan and their household. Furthermore, in the absence of the coverage in financing healthcare, they have to rely on more regressive source of financing to cover the healthcare costs, mostly on out of pocket payments, savings, sale of asset, entry into debt etc.

[7] We have again suppressed the coefficients for brevity.

4.4 Experimental Results

4.4.1 Health Care Utilization

For the first set of outcomes, we look at effects of the health security scheme on health care utilization or health seeking behavior. The simple intent-to-treat results are presented in Table 5. First we find that the scheme did not have any causal impacts on the overall health seeking care behavior. While the point estimate is positive with an odds ratio of 1.09, it cannot be rejected from the null hypothesis with a 95% confidence interval [CI] of 0.81 to 1.46 (see row [a], column (2) in Table 5). However, if we focus only on seeking in-patient care among households who reported any illness over the last six months, the odds ratio is higher with a point estimate of 1.40 which is also statistically significant at 90% level of confidence with a 95% CI of 0.99 to 1.99. These two results suggest that, as one would expect, since the health security scheme incentivized the beneficiary households to see in-patient hospitalization care, the impact is larger and more significant for hospitalization and much weaker for overall health care seeking behavior (such as inpatient visits).

The design of the scheme itself imposes some implicit and explicit restrictions on the household's decision regarding health care seeking and we can test some of those restrictions to evaluate the scheme (as can be seen in Figure 1). Firstly, we find the impacts vary by gender of the patient. The odds of seeking inpatient services among men is 1.20, however, it is not statistically significant with a 95% CI of 0.71-2.04. However, the scheme has a larger positive impact on women's hospitalization with an odds ratio of 1.54 (with a 95% CI of 0.95-2.51, the coefficient is statistically significant at 90% level). Since, the household receives the insurance benefit primarily because of the female artisan, it is possible that it changes the unobserved bargaining position of the women within the household and we see more (health care) resources being channeled to the women compared with the existing equilibrium.

We further look at use of empaneled hospitals. The scheme is designed to alter the relative prices of hospitalization in favor of the empaneled hospitals, or in other words, reduce the relative prices of the hospitalization in those hospitals. Hence, we should expect that the households are responding to this incentive. We find that a strong effect of

hospitalization at the empaneled hospitals because of the scheme with an ITT odds ratio of 1.78 (with a 95% CI of 1.20-2.64). We have further restricted our results by restricting to hospitalization (not reported here) and the results suggest that beneficiaries are probably switching hospitals because of the program. So, health insurance, even when it offers a small benefit (as we will see later in Section 4.4.2), can have effects on hospital choice.

Given the security scheme covers a small fraction of the total health care cost, it may be worth looking at the decision to seek inpatient care cost stratified by the *ex post facto* total cost. The beneficiaries may psychologically be more motivated to seek inpatient care, which are low (in terms of total cost) because a higher fraction of the cost will be reimbursed to the household (as evident from reviewing the scheme components, see Figure 1 and Section 2.2). The results are presented in rows [f] and [g]. Using an arbitrary cutoff of 25,000 taka (the results are not very sensitive to this cutoff), we find that the insurance scheme does not have any impact on inpatient care seeking if the cost is more than 25,000 taka (with an odds ratio of 1.00 with 95% CI of 0.41 to 2.44). However, the odds ratio is 1.50 (with a 95% CI of 1.03 to 2.18) for the hospitalization with less than 25,000 taka in health care cost. This suggests that the households may be more sensitive to proportion saved for a given health care and use the health insurance to save out-of-pocket expenditure selectively on health expenditure of smaller sizes (see Thaler 1980).

4.4.2 Health Care Expenditure

Next, we look at health care expenditure and we present the results in Table 6. We look at the results conditional on reports of any illness and also conditional on being hospitalized as the bulk of the benefits are targeted towards lowering the inpatient care cost for the beneficiaries. Here, we also include the mean for the control group, where applicable.

We find, from Table 6, that on average the beneficiaries in the treatment group have received about 151 taka per health care event. There is obviously no similar value for the control group, as they have not received the intervention. This suggests that the

beneficiaries received about 117 thousand taka as benefit in aggregate.[8] Next, we look at hospitalization cost. We find that on average the control group spends about 870 taka per event. The ITT effect of the insurance scheme on total inpatient expenditure is about 281 taka (see Column (2) in Table 6). The positive sign suggests there is, if anything, a positive impact on hospitalization cost (this is consistent with the evidence of higher utilization that we have seen before in Section 4.4.1). If we look at hospitalization cost net of insurance reimbursement, the results become smaller in size of 130 taka and remains statistically insignificant with a higher p-value of 0.62. In Columns (4)-(6), we focus on hospitalization cost within the sample of events of actual hospitalization. The control groups spend about 12,265 taka per hospitalization event. The treatment group has received about 1,452 taka per hospitalization event. Interestingly, the cost is not much higher for the treatment group (116 taka with a p-value of 0.96). If we focus on the inpatient care cost net of scheme coverage, we find a reduction of about 1,337 taka among the treatment group, however, this difference is not statistically significant with a p-value of 0.54.

We further look at other types of medical expenditure, notably cost for diagnostics and drugs. The results are presented in Table 7. On average, the control group has spent 275 taka over six months with a treatment effect of 25 taka, which has a p-value of 0.64. Hence, we can infer that the scheme has not led to increase in the other types of costs such as diagnostic. The results are very similar if we restrict our sample to hospitalization events only. We find that there is a substantial medicine cost as on average the households spend about 1,655 taka per event of illness over the last six months. For the whole sample, we do not find any statistically significant treatment effects on total or out-of-pocket health care expenditure. We find a negative coefficient of 618 taka for the treatment variable within the sample restricted to seeking inpatient hospital care. However, the coefficient is not statistically significant and we cannot reject the null hypothesis of zero effect. It is possible that the beneficiary households have diverted

[8] One should note this suggests some discrepancy with the results we have presented before in Section 4.3 and Table 2. In the multivariate regression, the coefficient does not correspond to the mean. In mean difference, we find that the reimbursement under the scheme is about 177 taka per event suggesting an aggregate of about 136 thousand taka, which is more similar in nature with the claim data we have collected.

some of the insurance reimbursement to buy medicines in the context of a hospitalization but the evidence is quite weak and should be interpreted with caution.

4.4.3 Mental Health Outcome

For the entire sample, we have looked at some aspects of mental health outcome. We have primarily focused on two aspects of mental health outcome: general anxiety and depression, which one can expect to be associated with access to health insurance scheme. We present the results in Table 8. One should also note that these results are presented at the worker-respondent level.

Generally, we do not find any impact that one can associate with the access to health insurance scheme. The control mean for GAD (a measure of anxiety) is 5.8 (see Column (1) in Table 8). We find a negative treatment effect of 0.15, however, it is not statistically significant (p-value = 0.78). Similarly, we find a control mean for PHQ-9 (a measure of depression) of 5.15. The treatment effect for PHQ-9 is 0.26 with a p-value of 0.73.

The lack of impact of the health insurance scheme on the mental health status is suggestive because the measurements may be prone to measurement errors. However, this is consistent with the results that we have found before. The out-of-pocket expenditure on different types of health care (inpatient, diagnostics and medicine) are not causally associated with the health insurance scheme (and they still have to pay the premium). Hence, the scheme has not led to significant savings. So, it is natural not to be able to reject the null hypothesis of no difference in the level of mental health between the two groups.

5 Discussion

In this study, we have aimed to contribute to the growing literature on impacts of health insurance schemes in the low and middle income countries. To the best of our knowledge, this is one of the first evaluation of such employer-sponsored model of insurance schemes, which is also mandatory in nature for the employees. Considering the sparse attention employer administered health insurance has received in literature, this study provides useful insights into possible benefits and constraints of providing such services in similar contexts.

Bangladesh has commitment to reach universal health coverage for her population and the government has recently started to pilot a tax-based health insurance scheme at few selected areas.[9] However, the program is selective and will have only the poorer segment of the population and like many government programs, may lead to leakage and mistargeting. There are some attempts to use community based health insurance scheme. But such programs are often prone to low demand and willingness to pay for health insurance remains low in countries like Bangladesh. The employers can play important roles in pooling a sizeable group of beneficiaries required to make any insurance plan viable. With low tax mobilization and competing needs of public fund, the contribution from the employer can also help to take the first step toward a broader based health-financing scheme.[10]

In this context, the evaluating health security scheme allows us to understand a very different modality to provide a health care financing method, which can be relatively easily implementable by exploiting an existing employer-employee relationship and existing management structure of the organization. Also, as Acharya, et al. (2013) have argued, it may be imperative for large health insurance scheme to have some tax contribution. Bangladesh remains one of the lowest tax mobilizing country and employer's contribution to this kind of pool may fulfill the gap in the short run at least.[11]

However, by comparing the total disbursement from the administrative data and total inpatient health care expenditure from the survey data we find that only a modest portion of such expenditure can be covered under the scheme. At the same time, we also find the utilization has led to the system to barely break even suggesting the program, as it stands currently, is probably "actuarially fare" (though some of the administrative costs are subsidized by the organization, for example, internalizing some of the human resource

[9] Further details of the program can be found at http://www.heu.gov.bd/shasthyo.php.

[10] Employer based insurance scheme can restrict people's mobility and contribute towards inefficiency in the labor market (see Fang and Gavazza 2011). However, developing universal health care is a process and employer-based insurance scheme can be right step towards it and help to consolidate these pools of clients into the most broadbased public insurance scheme in future (see Preker, Carrin, et al., 2004)

[11] With an average tax to GDP ratio of about 10%, Bangladesh has one of the lowest rates compared to its regional counterparts such as Nepal or India. See Mansur, Yunus and Nandi (2011).

cost and tying up with a BRAC's own health program, HNPP). Hence, any additional coverage will require a higher premium mobilization.

From anecdotal evidence and customer survey (we have not included them in the present version of the study), we believe that artisans are quite reluctant to pay additional amount as premium. This is paradoxical in two ways. Firstly, the utilization is quite high and, as we have found, basically exhausting all the premium revenue. Secondly, the households in our sample generally belong to the middle of the wealth and income distribution in reference to rural households (the average monthly income of the household is about 10 thousand taka per month). Hence, a premium of about 100 taka with possibly an equal contribution from the employer should be attractive to the consumer (at least in theory) as total premium revenue then will be able to cover about 60-75 percent of the total cost.

We find some systemic change in households' behavior in health seeking. While the overall health care seeking has not changed, but we find women are using it more than male members of the households. Households are also seeking care more from the covered hospital (a result previously noted by Levine, Polimeni and Ramage 2016, among others). Households are also more likely to use it for impatient care which requires smaller spending. This may be driven by other factors such as the types of illness and availability of services from the empanled service providers. We intend to look further into this. The access to the scheme through a female member of the household may change the relative bargaining position, which has led to more care for the them (the female members) and is a result observed in many different contexts in the economic, sociology and public health literature. However, this is probably first time we observe this in the context of health insurance provision, which can be a notable contribution to our understanding on how households possibly make decision regarding allocating scarce resources they have to distribute it among different household members.

6 Conclusion

As argued in the literature employer-based scheme can complement the national health financing system (as has been in countries like Thailand) and can contribute effectively in achieving universal health coverage. While it is not a complete solution, we

believe it can and will play important roles in developing our own system for protecting patients against catastrophic health care expenditure that can contribute further in the destitute of the households. Unfortunately, the labor market in Bangladesh remains largely informal. That makes the current model even more interesting because of its not-for-profit motive and reaching out rural women (and men) who may remain outside the reach of the formal employers. Hence, models like these should be studied further to understand their roles in UHC and also possible replicability in other sectors such as ready-made garment sectors. We believe this study can contribute further in this dialogue.

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Table 1: Utilization and Disbursement from Claim Data

	Kushtia		Manikganj		Nilphamari	
	Number (N= 137)	Disbursement (Total=405,000 taka)	Number (N=85)	Disbursement (Total=376,500 taka	Number (N=75)	Disbursement (Total=126,500 taka)
Disbursements by Beneficiaries (%)						
Artisan	47	58	54	53	48	49
Spouse	25	20	23	20	19	24
Parents	10	9	4	6	8	6
Children	18	13	19	21	25	22
Disbursement by Types (%)						
Medical	58	36	42	14	76	62
Emergency	17	6	11	2	11	6
Normal Delivery	3	1	4	1	7	4
C-section	10	19	15	21	3	9
Surgery	12	38	28	62	4	18

Note. Table 1 presents results from the administrative information incorporating percentage of claims and amount disbursed both by beneficiary and illness type in the three foundations where the security scheme is rolled out, from October, 2015 through April, 2016.

Table 2: Comparing Coverage, Claims and Health Care Cost for the Beneficiaries over the Study Period

Item	
Total number of coverage (artisan-month)	561
Total premium collection (taka)	196,350
Total number of claims	65
Total disbursement (taka)	190,500
Total inpatient health expenditure (taka)	12,42,689
Total disbursement as % of total inpatient health expenditure	15.33
Total health expenditure (taka)	32,31,535
Total disbursement as % of total health expenditure	5.9

Note. The coverage and claim information are from official administrative data. Total health expenditure (inpatient and claim) data are from household survey. The information from this table covers the period of October, 2015 to March, 2016, for which we have detailed health care expenditure data from the artisans who received the coverage under the *health security scheme*.

Table 3: Summary Statistics

Variable	N	Mean	Std. Dev.
Artisan characteristics			
Age (years)	1,081	30.8	8.6
Married (%)	1,087	0.81	0.39
Education (years)	1,087	6.1	3.7
Income (monthly BDT)	1,087	1,027.78	587.04
Household characteristics			
Latrine Shared	1,087	0.39	0.49
Has a TV	1,087	0.65	0.48
Cement floor	1,087	0.42	0.49
Rooms (number)	1,087	2.2	0.9
Has a bank account	1,087	0.37	0.48
Members (Number)	1,087	4.3	1.5
Has savings	1,087	0.65	0.48

Note. All the values are from the baseline household surveys.

Table 4: Balance Test

Variable	(1)	(2)	(3)	(4)
	Control Mean	Treatment Mean	p-values	
			Mean comparisons	Multivariate model
Artisan characteristics				
Age (years)	30.6	30.4	0.716	0.692
Married (%)	0.81	0.80	0.619	0.561
Education (years)	6.0	6.5	0.034	0.310
Income (monthly BDT)	956.98	1,133.80	0.000	0.060
Household characteristics				
Latrine Shared	0.21	0.21	0.787	0.346
Has a TV	0.33	0.37	0.058	0.240
Cement floor	0.21	0.24	0.039	0.514
Rooms (number)	2.2	2.1	0.216	0.347
Has a bank account	0.19	0.21	0.265	0.722
Members (Number)	4.4	4.2	0.031	0.228
Has savings	0.64	0.62	0.236	0.708

Note. All the values are from the baseline household surveys. Column (3) reports the p-values for simple mean comparisons from t-tests. Column (4) reports the p-values coefficients from a regression for treatment on the selected variables reported here predicting treatment assignment using baseline survey data.

Table 5: Effects of Health Security Scheme on Health Seeking Behaviors

	Treatment Effect for	(1)	(2)	(3)
		Odds Ratio	95% CI	N
[a]	Seeking Any Health Care	1.09	(0.81 - 1.46)	1,706
[b]	Seeking Hospitalization	1.40*	(0.99 - 1.99)	1,706
[c]	… among Men	1.20	(0.71 - 2.04)	646
[d]	… among Women	1.54*	(0.95 - 2.51)	1,053
[e]	… in an Empaneled Hospital	1.78***	(1.20 - 2.64)	1,706
[f]	… with Cost more than 25,000 taka	1.00	(0.41 - 2.44)	1,706
[g]	… with Cost less than 25,000 taka	1.50**	(1.03 - 2.18)	1,706

Note. Odds ratios on the treatment assignment variable from multivariate logit regressions are reported here in column (1). All variables from Tables 1 and 2 are included as controls (for brevity we do not report the coefficients here). Column (2) reports the 95% confidence intervals for the relevant estimated coefficients reported in column (1). Column (3) reports the number of observations. All analyses are carried out at the household-member-health event level conditional on reported illness over the last six months for which the treatment households received the insurance coverage. ***p < 0.01, **p < 0.05, *p < 0.1.

Table 6: Effects of Health Security Scheme on In-Patient Expenditure

	(1)	(2)	(3)	(4)	(5)	(6)
	For sample of households reported any illness			For sample of households reported any hospitalization		
	HSS Coverage	Hospitalization Cost	Hospitalization Cost Net of HSS Coverage	HSS Coverage	Hospitalization Cost	Hospitalization Cost Net of HSS Coverage
Control Mean	-	870.04		-	12,265.10	
Treatment Effects	150.86***	280.66	129.79	1,452.73***	116.14	-1,336.59
	(0.00)	(0.31)	(0.62)	(0.00)	(0.96)	(0.54)
Observations	1,703	1,703	1,703	141	141	141
R-squared	0.02	0.01	0.01	0.18	0.11	0.11

Note. Authors' calculations from the household surveys. The p-values are reported in the parentheses. ***p < 0.01, **p < 0.05, *p < 0.1. Control variables from Table 1 were included in all specifications and standard errors are corrected for possible intra-cluster correlations.

Table 7: Effects of Health Security Scheme on Spending on Diagnostics and Drug

	(1)	(2)	(3)	(4)
	Spending on Diagnostics		**Drug Expenditure**	
Control Means	275.73	225.89	1,655.53	1,257.26
Treatment Effects	25.03 (0.64)	-36.26 (0.83)	139.11 (0.46)	-618.03 (0.26)
Observations	1,706	144	1,706	144
R-squared	0.01	0.05	0.01	0.06

Note. Authors' calculations from the household surveys. The p-values are reported in the parentheses. ***p < 0. **p < 0.05, *p < 0.1. Control variables from Table 1 were included in all specifications and standard errors corrected for possible intra-cluster correlations.

Table 8: Effects of Health Security Scheme on Mental Health Outcomes

	(1)	(2)
	GAD-7	PHQ-9
Control Means	5.83	5.15
Treatment Effects	-0.15	0.26
	(0.78)	(0.73)
Observations	1,089	1,089
R-squared	0.05	0.04

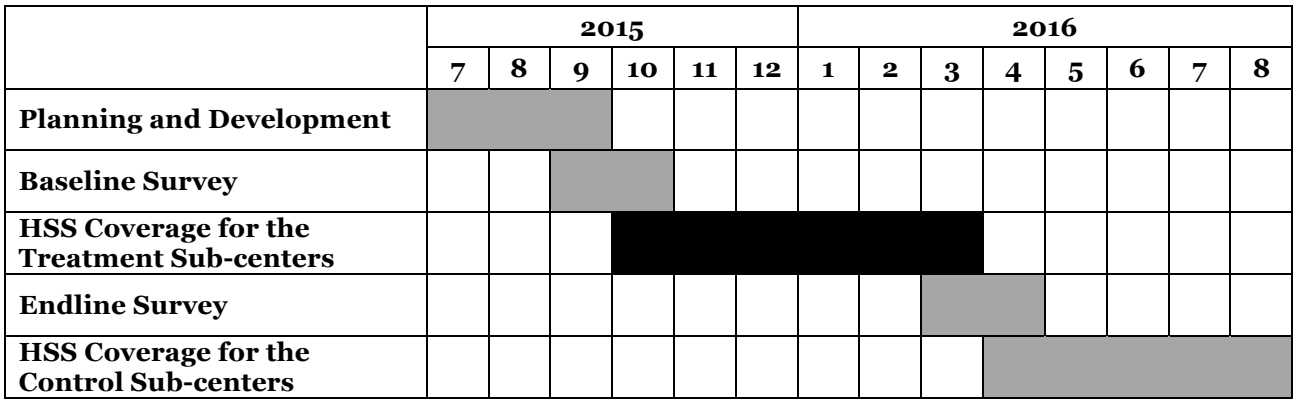
Note. Authors' calculations from the household surveys. GAD-7 measures the level of anxiety among the respondents while PHQ-9 indicates the level of possible depressions. The p-values are reported in the parentheses. ***p < 0.01, **p < 0.05, *p < 0.1. Control variables from Table 1 were included in all specifications and standard errors are corrected for possible intra-cluster correlations.

Figure 1: The Components of the *Health Security Scheme*

- For any immediate need: 1,000 taka (emergency, normal delivery, medical or surgical need)
- C-section: 5,000 taka
- Primarily in-patient services:
  - 7,000 taka if there are tests(!)
  - 9,000 taka if there is no medical test
  - 2,000 taka extra for hospitalization
  - 1,000 taka for transport if there is a referral
- Need to be employed for 4 out of last 6 months
  - Married artisan + 4 family members (unmarried children < 18)
  - Unmarried artisan + parents + unmarried children < 18
- Services covered at only **empanelled** service providers

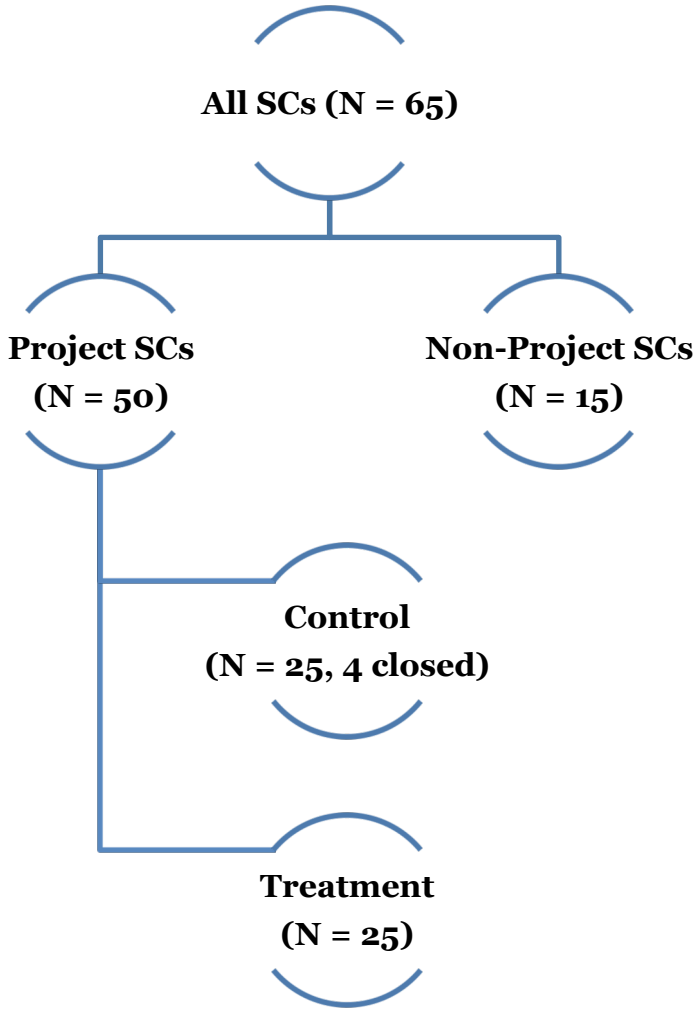
Note. Compiled from the official document of the implementing partner.

Figure 2: The Time-line for the Evaluation



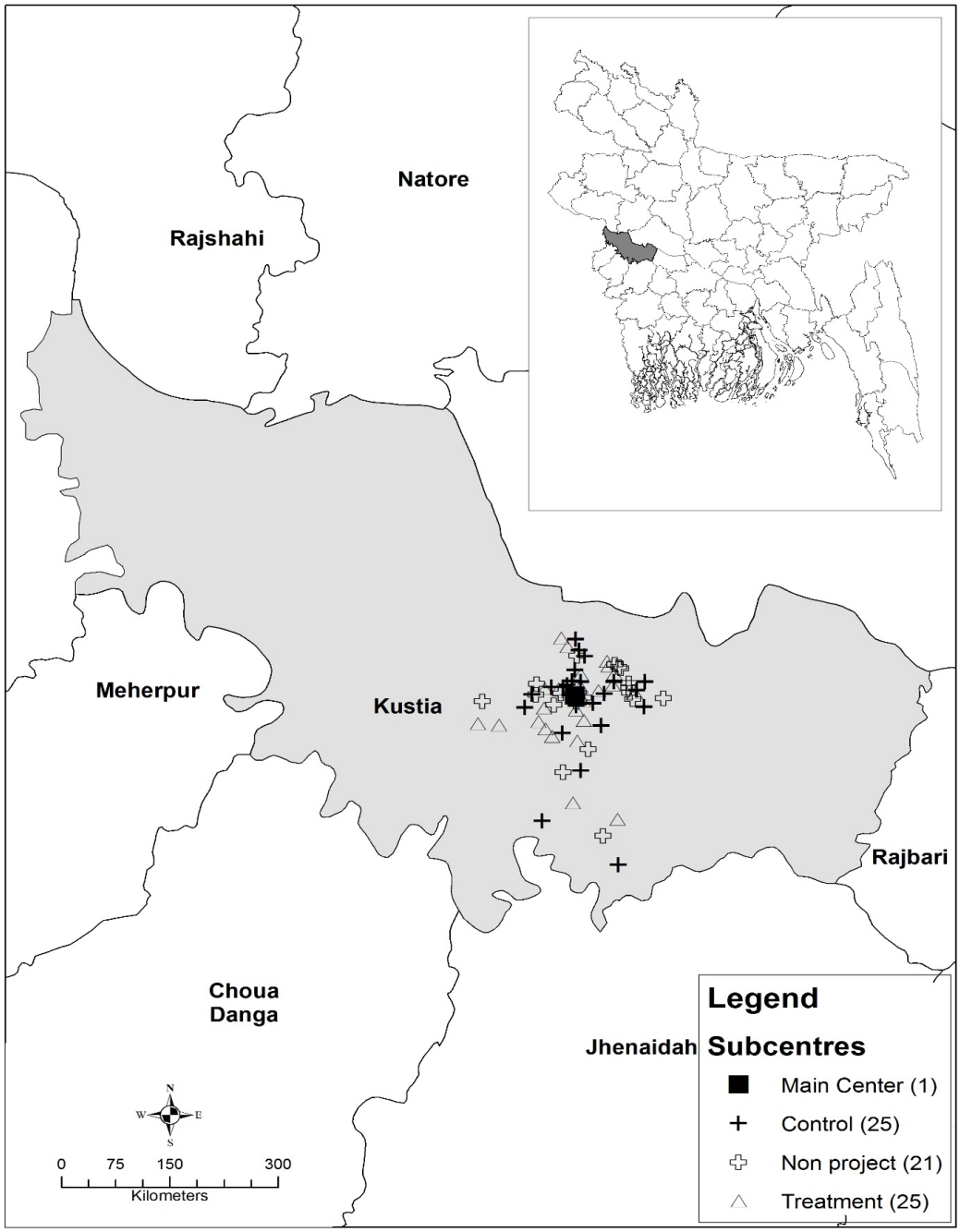
Note. Authors' rendition.

Figure 3: A Schematic Diagram of the Experimental Protocol



Note. Authors' rendition. While several sub-clusters were closed after the evaluation started, the research team ensured collecting data from the artisans who worked in those sub-centers. We also maintained the initial assignment to preserve the integrity of the randomization even if some of them were reassigned by the implementing partner to the treatment group.

Figure 4: Distribution of sub-centers located in Kushtia



Note. Authors' rendition using administrative data.

Appendix Table 1: Test for Sample Attritions

Variable	Missing in the follow-up		p-values	
	No	Yes	Mean comparisons	Multivariate model
Artisan characteristics				
Age (years)	30.8	30.8	0.967	0.492
Married (%)	0.79	0.81	0.693	0.807
Education (years)	6.1	6.1	0.984	0.503
Income (monthly BDT)	1,134.67	1,016.10	0.047	0.370
Household characteristics				
Latrine Shared (%)	0.36	0.39	0.460	0.927
Has a TV (%)	0.64	0.65	0.933	0.250
Cement floor (%)	0.54	0.40	0.006	0.028
Rooms (number)	2.3	2.2	0.240	0.331
Has a bank account (%)	0.33	0.37	0.367	0.733
Members (Number)	4.1	4.3	0.219	0.194
Has savings (%)	0.52	0.66	0.004	0.134
Treatment Status (%)				0.140

Source: Household Survey.

Appendix Table 2: Further Balance Tests

Variable	Only observed in the baseline				Only observed in the endline			
	Control Mean	Treatment Mean	p-values		Control Mean	Treatment Mean	p-values	
			Mean comparisons	Multivariate model			Mean comparisons	Multivariate model
Artisan characteristics								
Age (years)	28.2	32.0	0.066	0.012	28.6	26.0	0.073	0.630
Married (%)	0.78	0.80	0.828	0.285	0.88	0.72	0.041	0.043
Education (years)	5.8	6.3	0.530	0.221	6.9	7.8	0.210	0.806
Income (monthly BDT)	934.69	1,220.00	0.012	0.003	1,182.25	1,194.83	0.958	0.634
Household characteristics								
Latrine Shared (%)	0.41	0.33	0.475	0.337	0.34	0.27	0.356	0.953
Has a TV (%)	0.56	0.68	0.249	0.232	0.51	0.34	0.029	0.653
Cement floor (%)	0.50	0.56	0.573	0.548	0.31	0.26	0.500	0.565
Rooms (number)	2.2	2.3	0.699	0.809	2.3	2.1	0.505	0.367
Has a bank account (%)	0.22	0.37	0.121	0.577	0.35	0.29	0.409	0.316
Members (Number)	4.3	4.0	0.439	0.316	4.3	3.9	0.144	0.406
Has savings (%)	0.44	0.56	0.249	0.781	0.50	0.61	0.146	0.000

Source: Household Survey.

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