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Mandatory employer-sponsored health financing scheme for semiformal workers in Bangladesh: An experimental assessment

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Ethical considerations

The study received approval from the Institutional Review Board of the BRAC James P Grant School of Public Health at BRAC University to conduct research on human subjects. The research team obtained written informed consents from all the survey participants for both the baseline and end-line surveys. The researchers also took verbal consents from the participants and informed them about the use of a recording device for the purpose of in-depth interviews. The participants received a nominal compensation of 100 taka for taking part in the survey and had the option to decline or withdraw from the interview at any time. All 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.

CRediT author statement

Atonu Rabbani: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Writing - Original Draft, Writing - Review & Editing, Funding acquisition

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Mandatory employer-sponsored health financing scheme for semiformal workers in Bangladesh: An experimental assessment

Abstract

In this study, we present findings from an experimental evaluation of a mandatory employer-sponsored health insurance scheme in Bangladesh. We randomly introduced the scheme to female artisans to understand the impacts on healthcare utilisation, expenditure and subjective well-being using both survey and administrative data. Our findings suggest that the scheme broke even; however, it covered only six percent of the overall health expenditure and 16 percent of the hospitalisation costs. We find higher inpatient care utilisation, particularly among women, and in favour of empanelled hospitals causally associated with the intervention, consistent with the design of the scheme. We do not find significant healthcare savings or improvement in subjective well-being, consistent with low coverage. The findings suggest the scheme to be financially sustainable and it changes the healthcare seeking behaviours as the scheme incentivises. However, meaningful savings and protection against catastrophic health expenditures will require a higher level of coverage.

Keywords: Employer-sponsored health insurance, Health seeking behaviour, Out-of-pocket savings, RCT

JEL Classifications: H51, H75, I1

1 Introduction

An effective health insurance system can play a vital role in protecting households from the financial risks associated with catastrophic healthcare expenditures. However, most low- and middle-income countries lack a comprehensive healthcare coverage for their citizens (WHO 2010). In the absence of a prepayment-based risk-pooling mechanism, most people rely on out-of-pocket payments or borrowing from one's friends, family members or moneylenders to meet their healthcare needs (Townsend 1994; Fafchamps and Lund 2003). Nevertheless, these incomplete risk-sharing mechanisms often result in income and consumption volatility, asset depletion, destitutions and welfare loss (Townsend 1994; Van Doorslaer et al. 2006). This limits access to quality healthcare services for the world's 1.3 billion poor (Preker et al. 2004; Xu et al. 2003).

There is a steadily growing literature on the demand and impact of health insurance products among lower-income households, and a number of studies have already looked at the impact of health insurance on different beneficiary outcomes (Manning et al. 1987; Yin et al. 2008; Finkelstein et al. 2012; for a review, see Acharya et al. 2013). The lessons from these studies are quite mixed. Typically, voluntary health insurance schemes are characterised by low uptake, high turnover and insignificant impacts on healthcare utilisation. For example, Raza et al. (2015) have found no sizable impact on access and financial protection among the beneficiaries. Social health insurance can lower total healthcare expenditure and substitute use towards providers covered under the program (see Thornton et al. 2010, a result we also find here). Family members, ineligible for health insurances, for example, older children, may even end up with lower health care utilizations (Fitzpatrick and Thornton 2019). 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). In another example of a community-based health insurance (CBHI) model in Burkina Faso, Gnawali et al. (2009) have found increasing outpatient services utilisation among the enrolled beneficiaries without any significant differences in inpatient care seeking among the insured. CBHI can allow a better risk coping strategy by reducing reliance on borrowing and enhancing income earning potentials among insured households (Yilma, et al. 2015; Bocoum, et al. 2019).

It is important to note that selection plays an important role in determining the impacts of health insurance schemes. In community-provided healthcare financing schemes, adverse selection (more risky beneficiaries choosing purposefully to take part in the program), along with limited demand, is a valid concern, often making them ineffective in pooling risk over a large client base (Acharya et al. 2013). Furthermore, the insurance is unlikely to significantly cover the healthcare costs of the beneficiaries when take-ups remain low, accompanied by inadequate willingness-to-pay. For example, Ahmed et al. (2016) found WTP for health insurance of about 1.5 percent of total household income among informal sector workers in Bangladesh. The studies assessing the 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 retention rate remains very low, and enrolees drop off the program (Levine, Polimeni and Ramage 2016). Thornton et al. (2010) also finds a demand of only 20 percent among the clients who were offered an insurance product.

Majority of the labour force in Bangladesh is employed in the semiformal and informal sector with limited or no health insurance coverage because of high transaction cost. Considering the limitations of voluntary models (Gnawali et al. 2009; Mladovsky 2014; Raza et al. 2015), compulsory premium-based health insurance schemes can provide financial support for better health outcomes without the risk of further impoverishment. In this paper, using a cluster randomised controlled trial (RCT), we aim to evaluate and understand a novel employer-sponsored mandatory health insurance scheme, called Health Security Scheme (HSS), introduced to semiformal workers ('artisans') of a large not-for-profit manufacturer in Bangladesh. Hence, this study offers new and useful evidence of extending coverage and reducing the gap in healthcare utilisation in a semi-formal low- and middle-income country setting.

The paper proceeds as follows: Section 2 describes the context of the program. Section 3 presents the methodology, while Section 4 presents the findings from the data. Section 5 discusses the different implications of our findings, and Section 6 concludes.

2 The Context and the Program

2.1 Short description of the implementing partner

We have partnered with a large not-for-profit foundation which organises, trains and employs rural women with lower socioeconomic status. The foundation supplies to a leading local brand selling a number of different products, including handicraft and fashion items, through physical outlets throughout Bangladesh and an online platform. The brand is owned by a large NGO which channels the surplus from the sales to its various social development activities.

The producing organisation, an independent supplier, maintains a roster of about 35 thousand women workers or 'artisans', of which about 20 thousand work at any given point of time. A group of 25 to 30 female semiskilled or untrained artisans from local communities or villages usually work together in small clusters or 'sub-centres'. Located in 12 different districts of Bangladesh, these sub-centres serve as production hubs while providing technical assistances by hiring skilled craftsmen. The artisans are generally paid by the enterprise on a piece-rate basis based on the assigned tasks.

2.2 Short description of the program

The Health Security Scheme (HSS) was initiated in accordance with the broad social objective of protecting the poor rural women working as artisans against financial vulnerabilities. As a measure of avoiding the large and potentially catastrophic out-of-pocket health expenditures which often results in impoverishment, in 2015, the foundation introduced the HSS program as a pilot in two districts, namely, Manikganj and Nilphamari. After eight months, the foundation decided to extend the program to another district. At the behest of the researchers, the implementing partner agreed to stagger the introduction of the scheme randomly across different sub-centres within the district to understand the possible impacts of the scheme.

The scheme is mandatory for all eligible artisans (see Table 1 for the details). Eligibility primarily depends on how regular the artisan works with the foundation. The artisans pay a monthly premium of 25 taka, with an equal contribution from the employer as long as the artisans remain affiliated with one of the participating sub-centres. The scheme allows coverage for a maximum of five persons from an artisan's household: the artisan herself, her husband and her unmarried children under 18 for a married artisan. For a never or

previously married artisan (e.g., divorced or widowed), parents and up to two unmarried children under 18 can be included in the coverage.

HSS was primarily designed to cover inpatient or hospitalisation costs. The beneficiaries are reimbursed only if the services are received at one of the six empanelled hospitals, which include private clinics, government hospitals and public medical college hospitals. Furthermore, each artisan can obtain two payments annually for the entire household. The details of the design and features of HSS are shown in Table 1.

2.3 Utilisation information from the administrative claim data

We retrieved the administrative data of hospitalisation claims for the first six months of all three HSS-offering foundations to understand the overall scenario of healthcare utilisation. We looked at the total number of insurance claims and the total reimbursement to the beneficiaries. We further stratified the official claims and total disbursements by different types of services (see Appendix Table 1 for details on the utilisation and disbursement from the official claim data).

3 Methodology

3.1 Study approach

To understand the potential impacts of the health insurance scheme, we use three types of analyses. First, we explore the administrative claim data to recognise the level of actual utilisations. Second, we match the claims data with the information on total healthcare expenditure from the household survey, allowing us to understand the extent to which the program is providing coverage to households and generating OOP savings, if any. Lastly, we take advantage of an experimental protocol to understand the impacts of the health

insurance scheme on selected outcomes of interest. We primarily look at the overall and inpatient healthcare utilisations at different margins (e.g., separately for men and women) as well as the total and out-of-pocket expenditure on health, net of the scheme's contribution. Additionally, we investigate the household spending on drugs and diagnostics (not covered under the scheme) and the subjective well-being of the artisans.

3.2 Study site

After a thorough consultation, the foundation decided to introduce the program to Kushtia, a southwestern district bordering with India (see Appendix Table 2 for the timeline of the project). We chose this district purposefully to allow an adequate number of sub-centres to maintain a minimum sample size of 50 clusters. The partner organisation introduced the scheme to 25 sub-centres (the 'treatment' sub-centres), while it was delayed in 25 'control' sub-centres (chosen randomly by the research team, see Figure 2).

3.3 Sampling strategy

To identify the potential impacts of providing the health insurance scheme to the workers, we relied on between-cluster (as defined by the sub-centre) variations in participation into the program. With 80 percent power and 5 percent level of significance and 20 individuals with a reasonable level of intra cluster correlations, we found that we needed about 24 clusters in each of the treatment arms.

We randomly chose 50 sub-centres from 64 operating sub-centres at the onset of the project. Using further the random number generator in Stata™, we assigned 25 sub-centres into the treatment arm where the health insurance scheme was introduced, and the other

half (control group) was brought under HSS coverage after six months, allowing us a six-month window to understand the potential impacts of the scheme.

3.4 Data collection tools

We used a pretested structured questionnaire at both baseline and endline to collect artisan and household-level information, including overall socioeconomic and demographic information and incidences of illnesses. The surveys were very similar, except that the endline included additional questions regarding the intervention and program-specific knowledge. We collected additional information related to all health episodes in the endline as opposed to the baseline where we collected information on the last 'major' health episode within the last six months. The quality of the data source was ensured, starting with the training of the interviewers and direct field supervision and ending with proper documentation and electronic preservation of the database.

3.5 Data collection

At the baseline, we collected data from a total of 1,087 artisans (531 in treatment, 556 in control) representing information of 4,719 household members during September and October in 2015. Approximately six months after the health security scheme was launched, we administered the endline in March and April 2016. The end-line survey included 1,144 artisans (552 in treatment, 592 in control), with 115 new artisans who joined the sub-centres (both control and intervention) after the baseline survey. The survey included information from 5,015 household members, including 134 members who were new to the household either through marriage or birth, whereas 50 members left the households. We also excluded 10 household members who died in between the two surveys.

In the follow-up survey, we lost 59 artisans, along with their households, out of the original 1,087 households (a total attrition rate of 5.4 percent). The rate of attrition between October 2015 and March 2016 was 4.0 percent (N=22) for the control group and 7.0 percent (N=37) for the treatment group. The plausibility of outcomes being affected by attrition differential is little as the rates of loss to follow-up are fairly low in each group. We further test whether any differential attrition exists between the two groups and reject the possibility of differential attrition (see Appendix Table 3).

Over the study period, the management of the foundation closed four sub-centres down, all of which belong to the control group. As our analysis relies on intent-to-treat (ITT) (Glennerster and Takavarasha 2013), we tracked down and surveyed those previously employed artisans as long as they did not migrate outside the study areas or the unions where they were initially surveyed in the baseline.

3.6 Outcomes of interest

We collected detailed information on outpatient and inpatient healthcare utilisation and expenditure for each individual household member, conditional on reported illnesses within six months preceding the survey, with particular focus on inpatient care requiring overnight hospital stays. We also collected detailed healthcare costs associated with doctor consultation, medicine, diagnostic tests and indirect costs, including transportation for each health event and separately for outpatient and inpatient care. We also asked how health expenditure is financed, including current income, past savings, selling assets, banks, friends, relatives and microfinance. We focused on a number of outcome variables expected to be causally related to access to health insurance, such as healthcare seeking behaviour and service utilisation.

Health insurance can potentially provide a buffer against destitute and financial hardship, improving subjective well-being. Hence, we assessed the non-specific psychological morbidity using GAD-7 and PHQ-9 to understand the possible impacts of the health insurance program and to measure the subjective well-being of the artisans in both the treatment and the control groups (Spitzer et al. 2006; Kroenke and Spitzer 2002).

In addition to the outcome variables, we also collected information on a range of demographic (age, sex, household size) and socioeconomic (educational attainment, occupational status, household income) indicators. To obtain overall household expenditure, we asked about weekly, monthly and yearly expenses. We also developed an asset index as proxy for socioeconomic status using principal component analyses (see Vyas and Kumaranayake 2006). For the treatment group, we also assessed the knowledge, awareness and satisfaction with the HSS program.

3.7 Analytical technique and identification

We estimate the treatment effects using an intent-to-treat (ITT) framework. We consider the sub-centres as units of intervention and artisans, along with their households, as units of observations (see Figure 2 for the study design). For both the baseline and end-line outcome variables, we cluster the standard errors at the sub-centre 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 of interest is T_i, which takes the value of 1 if the i-th artisan is associated with a sub-centre where HSS was introduced in the past six months and 0 otherwise. We include some time-invariant covariates (X_i) to control the observable factors

to estimate the treatment effects more precisely. Hence, the coefficient β will indicate the impact of HSS and allow us to estimate the ITT treatment effects.

4 Findings

4.1 Sociodemographic characteristic of the sample

We report the baseline characteristics of our sample in Table 2. We have a total sample size of 1,087 artisans, including the four sub-centres closed during the baseline survey (which were later reopened). The average age of the artisans is about 31 years (with a standard deviation [SD] of nine years). The majority of the artisans are married (about 81 percent). The artisans report having schooling of about 6.1 years (with a SD of 3.7 years) and an average monthly income of about 1,028 taka (with a SD of about 587 taka).

As for the household characteristics, about 40 percent of the artisans and their households share a toilet with some other family or household. Around 65 percent of the household have TVs, and about 42 percent of the houses have cement floors, with an average of two rooms. Only about 37 percent of the households have an account at a commercial bank, suggesting a modest access to financial institutions. The average household size for our sample is 4.3, and around 65 percent of the households have a savings account, mostly with microfinance institutions (MFIs). The average monthly household expenditure is about 15,126 taka (SD = 8,915 taka). The sampled households represent a socioeconomic status better than an average nationally representative rural household (see BBS 2011).

4.2 Balance test and attrition

Next, we test the balance of our sample and assess the integrity of the randomised control trial. We also present the results in Table 2, see Columns (3) and (4). First, we compare the mean values of different artisan and household characteristics between the control and the treatment groups. Then we further predict the treatment assignment using a simple binary outcome model and report the p-values for all the coefficients (Columns 5 and 6, Table 2).

The simple mean comparisons show that most of the variables, such as age, marital status and whether the households share latrine, do not exhibit any statistically significant differences between the two groups. However, the artisans in the treatment group have a higher level of education and earnings per month. We also note a statistically significant difference in terms of whether the households have cement floors and access to a TV and in terms of household size, but the magnitudes are quite small. The multivariable analyses suggest that none of the individual artisan and household characteristics can statistically predict the treatment status, except for the monthly income of the artisans (Column 6, Table 2). However, in all ITT analyses, we include the time invariant household characteristics and baseline values as controls.

We lost some respondents in the end-line survey mostly because of migration. We used the baseline characteristics to check whether any difference exists between the households that we lost and the ones that remained in our end-line sample. We also used a multivariable model to test if there was any differential attrition. The results are presented in Appendix Tables 3 and 4. We do not find any systematic differential attritions between the two groups.

4.3 Coverage, claims and healthcare expenditure

As of April 2016, 561 individuals from the treatment group (artisans and their families) have benefitted from the scheme. To evaluate how much the health 'insurance' has affected the aggregate level of health spending among those treatment households, we use the health spending data collected in the end line and combine overall health spending. In the first six months, HSS served 561 artisans in 25 sub-centres, and the scheme settled 65 claims. The scheme collected 196,350 taka in premium and disbursed 190,500 taka to the beneficiaries. The total disbursements amounted to about 15.3 percent of the total hospitalisation costs during the same period and about 5.9 percent of the total health expenditure for the households (Table 3).

4.4 Experimental results

4.4.1 Healthcare utilisation

First, we look at the effects of the HSS on healthcare utilisation and health seeking behaviours. The ITT results are presented in Table 4. We do not find any causal impacts of the scheme on the overall healthcare seeking behaviours. While the point estimate is positive with an odds ratio of 1.09, we cannot reject the null (p-value = 0.569, 95% CI: 0.81–1.46; see Row [a], Table 4). However, for hospitalisation within the last six months, we find higher odds of 1.40 (p-value = 0.059, 95% CI: 0.99–1.99; see Row [b], Table 4) consistent with the reduction in out-of-pocket cost for inpatient care per design.

The scheme further imposes some explicit and implicit restrictions which we test to evaluate the impacts of the scheme. First, we find that the impacts vary by gender of the beneficiaries. But the scheme has a larger positive impact on hospitalisation among

women, with an odds ratio of 1.54 (p-value = 0.081, with a 95% CI of 0.95–2.51; see Row [d]). Since, the household receives the insurance benefit primarily because of the female artisan, perhaps it changes the unobserved bargaining position of the women within the household, and we see more resources being channelled to the women for health care.

Again, by design, the scheme further reduces the relative prices for seeking inpatient care at empanelled hospitals. We find a strong positive effect on hospitalisation at empanelled hospitals, with an odds ratio of 1.78 (p-value = 0.004, with a 95% CI of 1.20–2.64; see Row [e]). These results suggest that the scheme has led the beneficiaries to use empanelled hospitals more even when the financial benefits are modest.

We then assess the household responsiveness to access to the health insurance stratified by size of the costs of hospitalisation. We divide the ex-post hospitalisation expenditure below and above the median. If the households face liquidity constraint against meeting the larger healthcare expenditure, then health insurance may have a stronger effect for health care that costs more to the households. We find positive effects for both types of hospitalisation care with below and above median costs. Particularly, ITT estimate for inpatient care above median expenditure has a larger coefficient of 1.49 (p-value = 0.109, with a 95% CI of 0.96–2.53; see Rows [f] and [g] in Table 4), consistent with situations where households face more stringent liquidity constraints.

4.4.2 Healthcare expenditure

Table 5 presents the results on healthcare expenditure. As the bulk of the benefits are targeted towards lowering the inpatient care cost for the beneficiaries, we look at overall health expenditure conditional on being ill, as well as separately for costs associated with inpatient care. We find on average the beneficiaries in the treatment group have received

around 151 taka per healthcare event (see Table 5). The beneficiaries have received about 117 thousand taka as benefit in aggregate. For inpatient care, we find that on average, the control group spends about 870 taka per event. The effect of the scheme on total health expenditure is about 281 taka (p-value = 0.31; see Column 2 in Table 5), and the sign suggests a positive impact on hospitalisation cost, which is consistent with the evidence of higher utilisation that we have seen before in Section 4.4.1. If we look at hospitalisation cost net of insurance reimbursement, the results become smaller in size of 130 taka and remain statistically insignificant with a p-value of 0.62. In Columns (4)–(6), we focus on hospitalisation cost conditional on seeking inpatient care. The control group spends about 12,265 taka per hospitalisation event. The treatment group has received about 1,452 taka per event. Interestingly, the treatment group spends about the same amount on inpatient care (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, though this difference is not statistically significant with a p-value of 0.54.

We further look at other types of medical expenditure, notably spending on diagnostics and drugs. The results are presented in Table 6. Over six months, average spending in the control group is 276 taka with an insignificant treatment effect of 25 taka, which suggests 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 control group sample to hospitalisation events only. We find that over the last six months, for an average household, there is a substantial medicine cost of about 1,655 taka per event of illness. For the whole sample, we do not find any statistically significant treatment effects on total or out-of-pocket healthcare expenditure. We find a negative coefficient of 618 taka for the treatment variable within

the sample restricted to the events 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 some of the reimbursement to buy medicines. However, our estimates are too imprecise to draw any substantive conclusion on this.

4.4.3 Mental health outcomes

Generally, we do not find any impacts of participating in HSS on subjective well-being as measured by GAD-7 and PHQ-9. The control mean for GAD-7 (a measure of anxiety) is 5.8, with a treatment effect of -0.15 (p-value = 0.916). Similarly, the control mean for PHQ-9 (a measure of depression) is 5.15, with the treatment effect of 0.26 (p-value = 0.606). This is consistent with the scheme not leading to any significant savings for the beneficiaries (see Section 4.4.2). Hence, we do not find any improvement in the subjective well-being of the beneficiaries causally associated with an access to the scheme.

5 Discussion

In this study, we aim to contribute to the growing literature on the impacts of health insurance schemes in low- and middle-income countries (Acharya et al. 2013; Hamid 2019). To the best of our knowledge, this is one of the first evaluations of an employer-sponsored model of mandatory insurance schemes for employees in a semiformal sector in a low- and middle-income country. Most insurance programs are targeted for the poorer segment of the population based on some proxy means or index-based selection process often leading to mistargeting (Miller, Pinto and Vera-Hernán 2013). Considering the sparse attention employer-administered health insurance has received in the literature, this study

can provide useful insights into the possible benefits and constraints of providing such services in similar other contexts.

Many low- and middle-income countries are committed to having universal health coverage for their population, and the governments in many countries, including Bangladesh, have been experimenting with different modalities to provide their citizens financial protection against rising healthcare costs (Hamid 2019). Some of the 'insurance' programs are selective and are only targeted towards the poorer segment of the population, prone to leakage and mistargeting. Community-based health insurance schemes exhibit very low demand mitigating their effectiveness (Thornton et al. 2010; Mladovsky 2014; Raza et al. 2015). Willingness-to-pay for health insurance also remains low in countries like Bangladesh, limiting the private market (Ahmed, et al. 2016). Hence, the employers can play important roles in pooling a sizeable group of beneficiaries required to make any insurance plan viable. With low tax mobilisation and competing needs of public fund, the contribution from the employer can also help to take the first step towards a more broad-based health-financing scheme.

In this context, the evaluating health security scheme allows us to understand a very different modality to provide a healthcare financing method, which can be relatively easy to implement by exploiting the existing employer-employee relationship and management structure of the organisation. We find a high utilisation of the scheme in the sense that the scheme basically broke even over the study period. Our qualitative process evaluation reveals the claims are settled reasonably fast. The whole process is vertically integrated by the employer, including the marketing of the scheme, enrolment, premium collection and

claim settlement. This has allowed a lower transaction cost for the beneficiaries and helps with the desired utilisation of the scheme.

Comparing the total disbursement with the administrative data and the total inpatient healthcare expenditure with the survey data, we find that only a modest portion of health expenditure can be covered under the scheme. At the same time, we also find that the utilisation has led the system to barely break even, suggesting the program, as it stands currently, is probably 'actuarially fair'.[1] Hence, any additional coverage will require a higher premium. This is programmatically challenging as the willingness to pay is very low at the margin, and we find the employer to be somewhat reluctant to increase premium further.

The low willingness to pay for a higher premium is paradoxical in two ways. Firstly, the utilisation 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 distributions compared with average rural households. Hence, a premium of about 100 taka, with possibly an equal contribution from the employer, should be attractive to the consumer as total premium revenue will then be able to cover about 60–75 percent of the total annual healthcare cost. We speculate lack on prior experience with health insurance and lack of trust in such system is associated with willingness-to-pay for higher premium (De Allegri, et al. 2009, Bocoum, et al. 2019).

We find some systemic changes in households' healthcare seeking behaviours. While the overall healthcare seeking has not changed, we find women, in particular the artisans,

[1]Some of the administrative costs are subsidised by the organisation, for example, internalising some of the human resource cost by working closely with a large international NGO to help with the operations.

are using the scheme more than the male members of the households. The inpatient care utilisation is significantly higher at empanelled hospitals by the households covered under the scheme, a result previously noted by Levine, Polimeni and Ramage (2016). They are also inclined to use it for inpatient care, which requires larger spending. The access to the scheme through a female member of the household may change the relative bargaining position, which led to more care for them. In general, the changes in healthcare utilisation are consistent with the design of the scheme. Such behavioural reactions, often termed as moral hazards, should be considered while designing viable health insurance schemes.

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 (Sumriddetchkajorn et al. 2019). While it is not a complete solution, we believe it can and will play important roles in developing systems for protecting patients against catastrophic healthcare expenditure. Unfortunately, the labour market in Bangladesh remains largely informal. That makes the current model even more interesting because of its not-for-profit motive of reaching out to rural women (and men) who remain outside the reach of the formal employers. It is also possible employer-based insurance scheme can restrict people's mobility and contribute towards inefficiency in the labour market (see Fang and Gavazza 2011). However, developing universal health care is a process, and an employer-based insurance scheme can be the right step towards it and can help to consolidate pools of clients into the most broad-based public insurance scheme in the future (see Preker, Carrin et al. 2004). Hence, health financing models, like

the one we have studied here, should be studied further to understand their roles in universal health coverage.

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Table 1: The Key Features of *Health Security Scheme*

Parameter	Description
Eligibility	Regular artisans are eligible for the scheme. There is an automatic enrolment as long as the artisans have worked four out of past six months at the sub-centre where the scheme is being run.
Premium	BDT 25 per month per beneficiary (deducted automatically from the monthly salary) with equal contributions of BDT 25 from the artisan and employer.
Policy Period	One year from the month of enrolment or until the artisan remains registered with the sub-centre
Coverage limits	For any immediate/emergency need: BDT 1,000 (emergency, normal, medical, or surgical need) C-section: BDT 5,000 In-patient services: BDT 7,000 if there are incurred medical tests; BDT 9,000 if there are no medical or diagnostic tests; BDT 2,000 if the patient required hospitalization; BDT 1,000 for transport if there is a referral.
Deductible/Co-payment/ Coinsurance	There is no provision for deductible or co-payment as such. The beneficiaries are required to pay beyond coverage limits
Prior Authorization	For immediate and/or emergency services no prior the beneficiaries do not need any authorization. For in-patient services, the beneficiaries needed to inform the implementing partner through the sub-centre management.
Empanelled (In-Network) Service Provider	Services are covered if received if pre-listed empanelled hospitals.
Management	Aarong, Ayesha Abed Foundation and BRAC HNPP jointly manages the scheme

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

Table 2: Summary statistics and Balance Test

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	All		**Control**	**Treatment**	**p-values**	
	Mean	**Std. Dev.**	**Mean**	**Mean**	**Mean comparisons**	**Multivariate model**
Artisan characteristics						
Age (years)	30.8	8.6	30.7	30.9	0.766	0.271
Married (%)	0.81	0.39	0.81	0.81	0.925	0.974
Education (years)	6.1	3.7	5.9	6.3	0.082*	0.251
Income (monthly BDT)	1,027.78	587.04	933.3	1126.7	0.000***	0.009***
Household characteristics						
Latrine Shared	0.39	0.49	0.40	0.38	0.522	0.413
Has a TV	0.65	0.48	0.61	0.69	0.013**	0.201
Cement floor	0.42	0.49	0.39	0.45	0.040**	0.843
Rooms (number)	2.2	0.9	2.2	2.2	0.284	0.481
Has a bank account	0.37	0.48	0.35	0.38	0.373	0.882
Members (Number)	4.3	1.5	4.4	4.2	0.073*	0.331
Total Monthly Expenditure (BDT)	15,125.46	8,915.09	15,225.51	15,020.70	0.705	0.435
Has savings	0.65	0.48	0.66	0.63	0.317	0.611

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. The p-values are reported in the parentheses. ***p < 0.01, **p < 0.05, *p < 0.1.

Table 3: Comparing Coverage, Claims and Health Care Cost for the Beneficiaries over the Study Period

Item	
Total number of artisan covered	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	15.3
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 4: Effects of Health Security Scheme on Health Seeking Behaviours

	Treatment Effect for	(1)	(2)	(3)	(4)
		Odds Ratio	p-value	95% CI	N
[a]	Seeking any health care	1.09	0.569	(0.81 - 1.46)	1,703
[b]	Seeking in-patient care	1.40*	0.059	(0.99 - 1.99)	1,703
[c]	… among Men	1.20	0.491	(0.71 - 2.04)	646
[d]	… among Women	1.54*	0.081	(0.95 - 2.51)	1,053
[e]	… in an Empanelled Hospital	1.78***	0.004	(1.20 - 2.64)	1,703
[f]	… with below Median Cost	1.35	0.222	(0.83 - 2.18)	1,703
[g]	… with above Median Cost	1.49	0.109	(0.96 - 2.53)	1,703

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 5: 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 6: Effects of Health Security Scheme on Spending on Diagnostics and Drugs

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

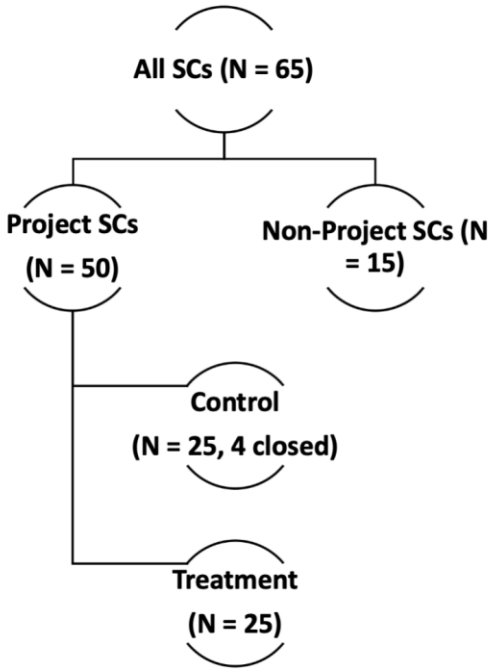
Note. Authors' calculations from the household surveys. The p-values are reported in the parentheses. ***p < 0.01, **p < 0.05, *p < 0.1. Control variables from Table 1 were included in all specifications and standard errors are corrected for possible intra-cluster correlations.

Table 7: Effects of Health Security Scheme on 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

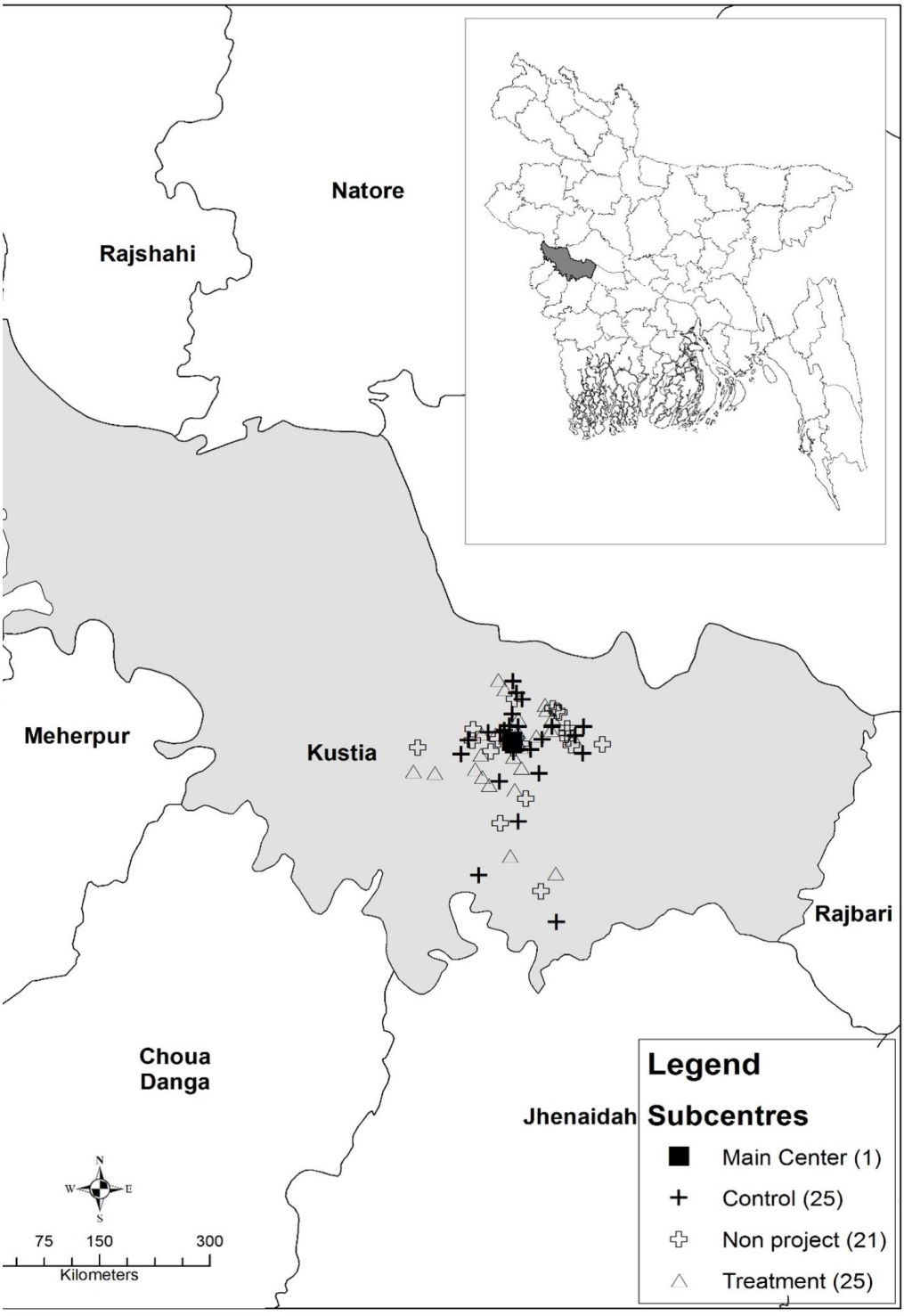
Note. Authors' calculations from the household surveys.GAD-7 measures the level of anxiety among the respondents while PHQ-9 indicates the level of possible depressions. The p-values are reported in the parentheses. ***p < 0.01, **p < 0.05, *p < 0.1. Control variables from Table 1 were included in all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

Figure 1: 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-centres. 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 2: Distribution of sub-centres located in Kushtia



Note. Authors' rendition using administrative data.

Appendix 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. Appendix Table 3 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.

Appendix Table 2: The Timeline for the Evaluation

	2015						2016							
	7	8	9	10	11	12	1	2	3	4	5	6	7	8
Planning and Development														
Baseline Survey														
HSS Coverage for the Treatment Sub-centres														
Endline Survey														
HSS Coverage for the Control Sub-centres														

Note. Authors' rendition.

Appendix Table 3: Test for Sample Attritions

Variable	(1)	(2)	(3)	(4)
	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 4: 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.