

## Original Research Article

### **Employer-sponsored Health Insurance (ESHI) Scheme- A New Model of Health Micro Insurance for the Garment Workers in Bangladesh**

#### **Abstract**

**Aim:** To evaluate health service coverage with disease prevention, access to health information, and cost control through health financing to help take appropriate decisions for the betterment of garment workers in Bangladesh.

**Study design:** Retrospective observational study.

**Place and Duration of Study:** The study was conducted in seven readymade garments (RMG) factories in the Gazipur district from 24 April 2014 to 23 April 2015.

**Methodology:** A total of 9717 workers aged 18 to 60 years and belonging to the lowest salary groups were included in this Employer-Sponsored Health Insurance (ESHI) scheme. This new model of Health Micro Insurance (HMI) had treatment, laboratory facilities, health education, and medicine supply. The annual coverage for treatment cost was up to 15000 Bangladeshi taka (BDT) or US\$192.8 and the premium for enrolment in the scheme was 487 BDT (US\$6.3). An agreement foresaw that the surplus cost accrued was equally shared between the insurance company and the factory owner. A common software was used to generate and view all medical information.

**Results:** A total of 4524 (46.6%) workers (60.5% male and 39.5% female) received treatment. The participant's mean age was 28.3 years. The mean consultancy rate was 4.7 times. Participants mostly suffered from gastrointestinal problems (24.4%), and most prescribed medications were anti-ulcer drugs. The median value of drug cost, investigation cost, consultancy fees, and total medical cost were 126 (1.49 USD), 315 (3.71 USD), 200 (2.36 USD), and 734 BDT (8.66), respectively. The annual net premium paid by the factory owner was 4094504 BDT (48744 USD), and the total healthcare cost accrued was 5230156 BDT (62263 USD).

**Conclusion:** ESHI scheme is a better option for HMI for making healthcare accessible to the largest RMG sector in a developing country like Bangladesh.

*Keywords: Health Insurance, Garment Workers, Bangladesh*

## 1. INTRODUCTION

The ever-increasing population of Bangladesh makes healthcare a top priority for the Government (GOB). Health is a basic need of all people, but many people are deprived of proper healthcare needs in Bangladesh (1). The GOB does provide some healthcare free of cost, which is inadequate compared to the demand and needs. Out-of-pocket (OOP) health expenditure constitutes 64% of total healthcare expenditure in Bangladesh (2, 3). The study, including 13 Asian countries, showed that reliance on OOP payments for health services might lead to many households' catastrophic burden (4). For low-income people, appropriate healthcare is often unaffordable when they have to rely on OOP payments. OOP payments push over three percent of households into poverty annually, which rises to over 17 percent for those who experience catastrophic expenses (4). In addition, people in remote areas and urban slums are deprived of proper or adequate healthcare.

In Bangladesh organized universal health coverage (UHC) has not yet been introduced and private health services are affordable for only the high-income group. One of the basic principles in developed countries is to provide healthcare at affordable prices to other people. UHC, usually refers to a health care system that provides health care and financial protection to all citizens of a particular country (5).

To establish UHC, International Labor Organization (ILO) has been proposing Health Micro Insurance (HMI) for industrial workers for over two decades (6). The microfinance industry has been an effective tool in reducing vulnerability and poverty in Bangladesh over the last few decades (7, 8).

HMI is one of the most demanded insurance products by low-income households. Pre-payment and better risk pooling modalities have been identified internationally as key devices for ensuring equity in financing health care (9, 10). HMI is being used in developing countries like South America, India, the Philippines, Nepal, and Thailand. Recently Thailand has introduced Universal Coverage Scheme (UCS) known as the "30 Baht's scheme" (11). In Bangladesh organizations such as The Bangladesh Rural Advancement Committee (BRAC), Grameen Kalyan (GK), The German Agency for International Cooperation (GIZ) and Action for Social Advancement (ASA) are also trying to implement HMI. It draws attention to the demand for such health insurance products for low-income households from the perspective of a grass-root organization particularly BRAC (12, 13). Many community-based health insurance schemes do fail. Problems, such as weak management, poor quality government health services, limited resources, and false billing due to an unholy alliance of the employees of insurance as well as healthcare providers, can hamper success (14). As the executive agencies did not have sufficient healthcare facilities, they had to depend on private healthcare services that may not have had the desired level of ethical standards.

The Bangladeshi garment industry is one of the most important contributors to the nation's economy. It also accounts for a significant proportion of formal employment in the labor force (15), and these workers often face financial barriers in accessing quality healthcare (16). Provision of healthcare centers,

availability of qualified physicians during duty hours, medicine and treatment for emergency management, and chronic illness both for themselves and their families do not exist in most factories.

For ensuring access to quality healthcare and financial risk protection for garment workers, Bangladesh Diabetic Association (BADAS), implemented an industry-based 'Employer-Sponsored Health Insurance (ESHI)' project among these workers from 2014 to 2015. United Insurance Company (UIC), Telemedicine Reference Center Ltd. (TRCL), and the New Asia Group of garment factories collaborated on the project. The objective of the ESHI project was to evaluate health service coverage with disease prevention, access to health information, and cost control through health financing to help take appropriate decisions for the betterment of garment workers in Bangladesh.

## **2. MATERIAL AND METHODS**

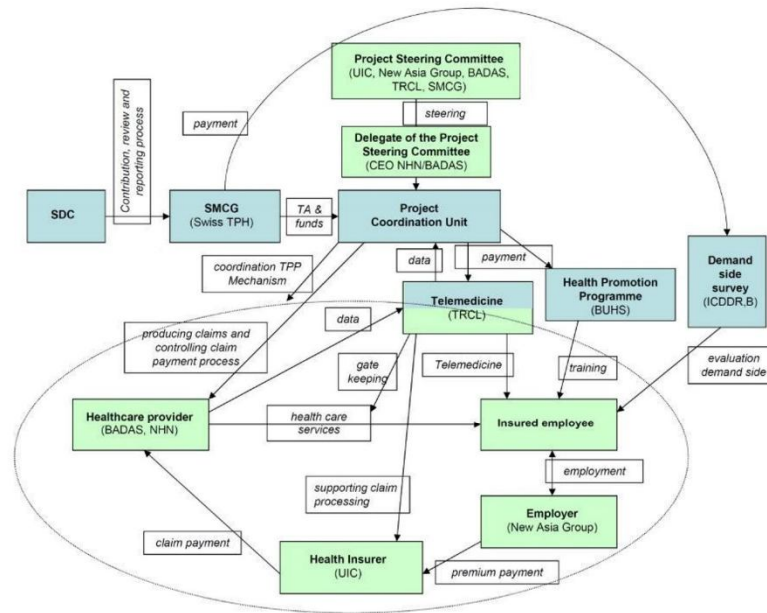
**2.1 Study design:** A retrospective observational study considering we were working on a secondary data review.

**2.2 Place and duration of study:** The study was conducted in seven readymade garments (RMG) factories in the Gazipur district of Bangladesh from 24 April 2014 to 23 April 2015. Gazipur district, an industrial city, is 30 kilometers north of the capital Dhaka city.

**2.3 Participants:** A total of 9717 workers aged 18 to 60 years and belonging to the lowest salary groups in seven RMG were included in this HMI program.

**2.4 The Employer-Sponsored Health Insurance (ESHI) Scheme.**

It included 4 stakeholders (Figure 1):



**Figure 1** Organogram of the project. Abbreviation. UIC, United Insurance Company; BADAS, Diabetic Association of Bangladesh; TRCL, Telemedicine Reference Center Ltd; SMCG, Swiss Micro Insurance Consultancy Group; CEO, Chief Executive Officer; NHN, National Healthcare Network; TPH, Tropical and Public Health; SDC, Swiss Agency for Cooperation and Development; BUHS, Bangladesh University of Health Sciences; ICDDR, B, International Centre for Diarrheal Disease Research, Bangladesh.

1. Diabetic Association of Bangladesh (BADAS) – the medical service provider
2. New Asia Group – the owner of garment factories and employer
3. United Insurance Company (UIC) – as an insurer
4. Telemedicine Reference Center Ltd. (TRCL) – gatekeeper and handling of medical data

The ESHI Scheme, called the “Health Plan”, was comprised of the following components:

- i. **Medical Treatment** – The Health Plan included medical treatment for the employees of the New Asia Group at BADAS outpatient facilities and/or in BADAS-associated hospitals for illness or injury in accordance with the terms and conditions of the scope of benefits defined for the Health Plan. The insured employees had to be identified and the names given in advance. The membership (inclusion in the insurance) was compulsory for all employees of the participating New Asia Group factories. The scope of benefits was well defined and included medical treatment for illness and accidents, hospitalization, outpatient treatment, telemedicine, consultant’s fee, routine investigations, major and intermediate surgery, medicines, ancillary services, and maternity benefits. Considering the pilot nature of the Health Plan there was no waiting period to qualify for maternity benefits for every member joining the Health Plan. The limitations were well-defined too. The limit was set at BDT 15000 (US\$192.8) per member for the duration of the one-year pilot, without further limitations such

as category-defined benefits. Only services provided by or through BADAS were covered by the Health Plan, including in case of emergencies. The medical treatment of the Health Plan excluded self-inflicted injuries, transplants, bypass surgeries, dental surgeries, dental implants, plastic surgeries, cancer treatment, and medication for chronic diseases like people with diabetes on insulin treatment, etc. Our study had not found any demand for these costly treatments.

- ii. **Premium for Health Plan** - The premium for the Health Plan for an individual was set at 487 BDT (US\$6.3) for the one-year period. There was no co-payment to bear by the patients up to the coverage limit of BDT 15000 (US\$192.8). When such a case showed up, New Asia Group Ltd agreed to pay the cost of treatment on a voluntary basis. In addition, they also paid for medical services above the insured limit of BDT 15000. The agreement foresaw equal sharing of benefits and losses resulting from this Health Plan between UIC and New Asia Group, whereas some remuneration for the administrative cost of UIC was agreed.
- iii. **Call Center as a Gatekeeper** - The Health Plan required calling the call center prior to consulting medical services. The garment workers were respectively informed with a leaflet they had got with all insurance information. TRCL consequently built up and ran a telemedical center in the localities of BUHS with young physicians having access to the Health Plan database and answering the calls 24 hours 7 days a week. The call center was given the task to act as a gatekeeper, providing telemedical advice by qualified personnel which supposedly would bring medical treatment costs down. Members of the Health Plan had to call TRCL for getting telemedicine advice (medical advice given by qualified personnel by phone) prior to seeking medical services.
- iv. **Health Promotion and Disease Prevention** – A health promotion initiative was elaborated for the Health Plan to improve the health status of garment workers and to convey the concept of Health Micro Insurance through the Bangladesh University of Health Science (BUHS), an institution of BADAS. BUHS distributed the Booklets and Videos in 5 (five) Modules,
  - a. Nutrition: The process of providing or obtaining the food necessary for human health and growth.
  - b. Hygiene, Communicable & Non-Communicable Diseases
  - c. Reproduction & Child Health
  - d. Occupational Health: Occupational health deals with all aspects of health and safety in the workplace with a strong focus on the primary prevention of hazards. The health of the workers had several determinants, including:
    - risk factors at the workplace leading to cancers
    - accidents, musculoskeletal diseases
    - respiratory diseases
    - hearing loss
    - circulatory diseases
    - stress-related disorders

- e. **Financial Literacy:** Financial literacy was provided to help the employees gain an understanding of the importance of collective benefits to avoid unnecessary consultation and hence reduce healthcare costs.
- v. **Online Platform for Running the Health Plan** - The experts of Swiss Micro Insurance Consultancy Group (SMCG) and TRCL together designed and implemented software building the platform to run the health insurance. A focus was set on facilitating the handling of a big number of bills resulting from the medical services with views on both sides, the side of the medical provider and on the side of the insurance reimbursing the bills. The administration was to be kept at a minimum and the controlling at a maximum level. Another focus was set on data collection allowing analysis of morbidity and cost of medical treatments. All data on membership, medical treatments, billing, and the reimbursing process were stored centrally. BADAS medical centers, Project Coordination Units (PCU), and UIC thus had access to the same databases which made the coordination of databases unnecessary. The users had installed the software locally and they were connected via the internet with the central server located at TRCL headquarters. The data copied on the local user stations were regularly synchronized with the centrally stored data allowing them to work offline in case of internet interruptions. The login required a username and password, and data were shown specifically to the needs of the user.
- vi. **Development of Code list of Diagnosis and Clinical Guidelines for the Online Platform for Running the Health Plan** - Based on the MSF guideline list of contents, the ICD-10 classification and a hospital adopted a more comprehensive coding system from the US (e-Health Solutions), a code list of the diseases most likely to be expected was stepwise developed for the online platform. An own sample coding system was elaborated, reaching from letter A (symptoms and signs) to W (injuries, intoxications, and extremely induced lesions) the respective 3 –digit ICD chapter numbers were assigned to it as well. This allowed changing to the ICD-10 system if required later on. The code developed for the Health Plan, allowed to assign a code to the most often seen diagnoses a priori and to expand the list very easily as new diagnoses were showing up. Each diagnostic group letter (A to W) had a code number 99, e.g. A99, leaving enough space for morbidity to be expected.
- vii. **Outdoor Treatment** - In Bangladesh insurance companies normally do not cover outpatient expenses. The customary practice of insurance companies is to cover the costs of admitted patients. Previous experience with health insurance had shown this method to increase social pressure for admission and increase the cost of healthcare. After a mutual discussion, UIC agreed to cover the outpatient costs as well as inpatient costs.
- viii. **Claims submission through Online Platform** – UIC, New Asia Group, and BADAS agreed that claims for healthcare service costs would be submitted through the Online Platform that was developed for the Health Plan.
- ix. **Reimbursing healthcare service costs to the medical service providers**-It was agreed that in this health plan, payments for healthcare service will be directly made into the BADAS account and not to

the insured person or patient. Therefore, the patient did not have to prepay his medical treatment and get reimbursed by the insurance.

- x. **Understanding about false billing and inspection cost** – The collaboration agreement had a clause where BADAS, the medical service provider, agreed that if on random inspection UIC, the insurer, found evidence of false bills then the medical service provider would be penalized.

## **2.2 Data Analysis**

Data were collected from a password-protected central database located at TRCL headquarters. Continuous data were presented as means (95% CI) or median (25/75 percentiles), while categorical data as frequencies (n) and percentages (%) as required. Bootstrap resampling technics were used for constructing confidence intervals and the Kaplan-Meier estimate was used to estimate survival analysis.

## **3. RESULTS AND DISCUSSION**

### **3.1 Enrolment and Demography**

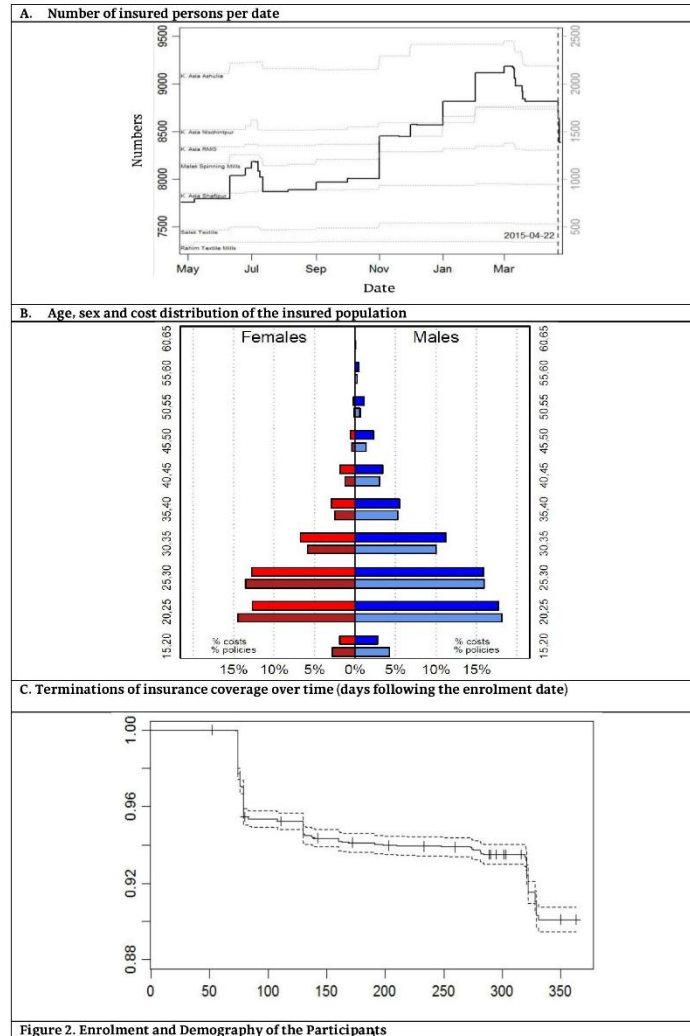
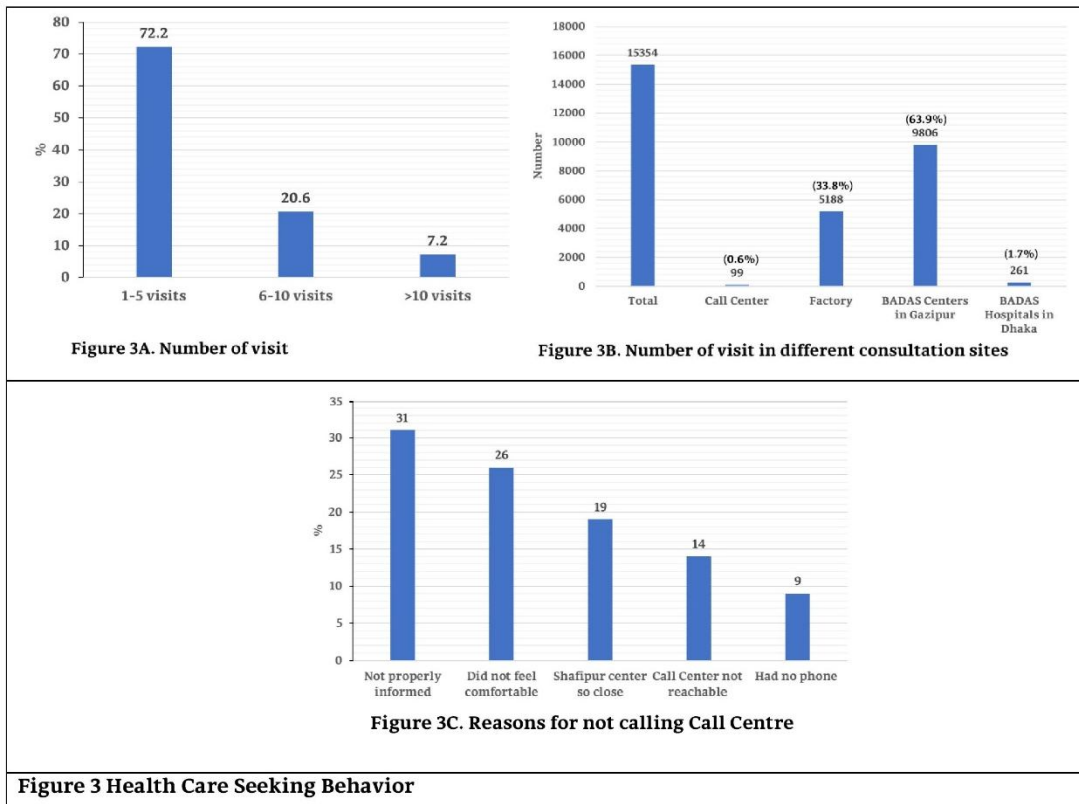


Figure 2. Enrolment and Demography of the Participants

**Figure 2** shows the enrolment and demography pattern of participants. The insurance scheme started with an insured population of 7756 garment workers on 24 April 2014. One year later, at the end of the pilot phase, the insured population had increased to 8818 members. During this period 1963 workers joined the insurance scheme, and 876 had left. Altogether 9717 garment workers were enrolled in the scheme. The mean number of insured persons was 8337. The fluctuation in the number of insured garment workers did not show noteworthy differences between the 7 factories (**Figure 2A**).

Around 58% of the insured population were males with an age of 28.5 years on average. The female population was 27 years old on average (**Figure 2B**). The cost was below average for the age group younger than 30 years, and above average for the group above 30 years. This was true for both sexes. Survival analysis estimates that about 10% of the members terminated their insurance contract within the pilot year (**Figure 2C**).

### 3.2 Health Care Seeking Behavior

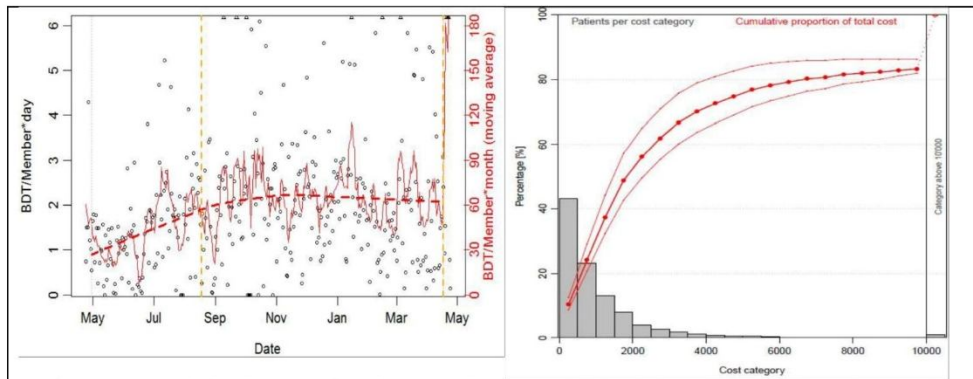


**Figure 3** shows the healthcare-seeking behavior of participants. During the pilot phase, 46.6% of the insured worker population or 4524 garment factory employees sought medical advice in a total of 15354 medical consultations. They had 4.7 consultations on average (median (25/75 percentiles): 4 (2/6 consultations)). About 72.2% of the participants sought help 1-5 times, 20.6% were between 6 and 10 times, and the remaining 7.2% visited more than 10 times (**Figure 3A**).

A total of 5188 (33.8%) visits were in the factory, 9806 (63.9%) in two BADAS centers in Gazipur, 261 (1.7%) in four BADAS referrals centers in Dhaka and only 99 (0.6%) used call centers (**Figure 3B**).

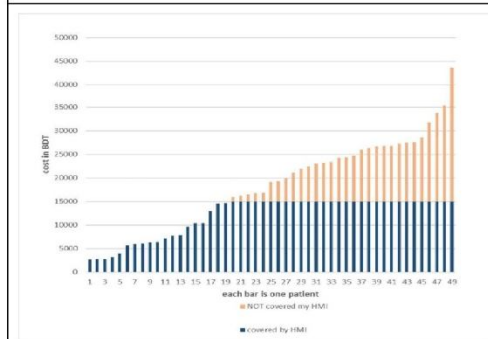
**Figure 3C** shows the reasons for not calling Call Centre. To find the reasons for this all members attending the NHN outpatient clinic in Shafipur were asked during a period of 3 days between 27 and 29 October 2014 why they did not call the call center prior to seeking medical services. A total of 31% of participants answered that they were not properly informed, 26% informed they did not feel comfortable, 19% informed about the proximity of the medical outpatient facility to the factory, 14% informed Call Center not reachable and 9% had no phone.

### 3.3 Cost Analysis

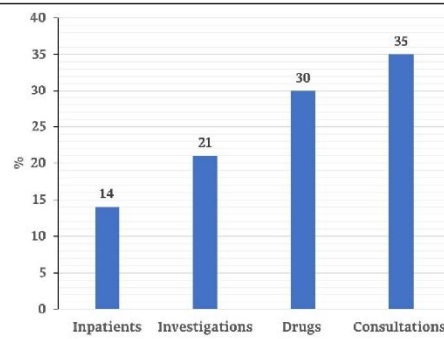


**Figure 4A. Determining the appropriate time Interval for estimating Medical Cost**

**Figure 4B. Relation between Patient Cost Category and Cumulative Cost (with 95% CI)**



**Figure 4C. Cost Distribution of the 49 hospitalized patients**



**Figure 4D. Cost distribution of medical services**

#### Figure 4 Cost Analysis

In Figure 4A - Dots represent the cost per member on each single day. The red line represents the cost per member per month (30 days) calculated as moving average for each day (+/- 3 days). The red dashed line represents the lowest smoothing algorithm. The first and last week was discarded before applying the smoothing algorithm. The orange dotted lines represent the time interval selected for estimates (18 August 2014 to 17 April 2015).

In Figure 4B - The bars represent the frequency of patients within each cost category.

The red line shows the cumulative cost, with 95% CI. Confidence intervals were constructed using “bootstrap resampling” technics on member level with 500 replicates.

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**Figure 4** shows the healthcare-seeking behavior of participants. The mean medical cost per member per month during the study time period was estimated to amount to 71.2 BDT (95% CI: 66.3-75.1). If insurance payments are truncated at a maximum of 15000 BDT, the mean cost decreases to 66.7 BDT (95% CI: 63.0 - 69.4) (**Figure 4A**).

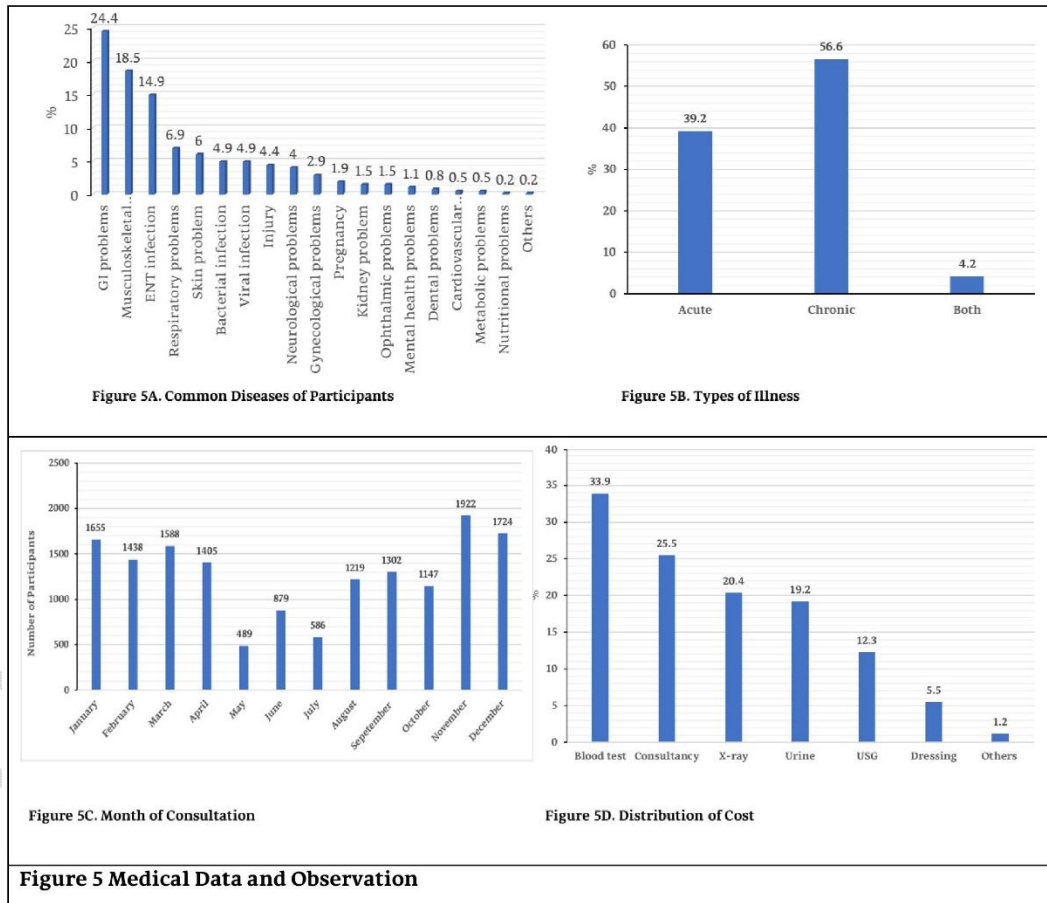
**Figure 4B** shows the distribution of patient cost categories (cost classes) and their proportional contribution to cumulative cost within study duration of analysis as defined above. About 42% of the patients (i.e., about 20% of the insured members) had an individual cost of less than 500 BDT causing about 10% of the overall cost. About 22% of the patients produced cost between 501 and 1000 BDT being responsible for about 12% of the overall cost. In 84% of all patients, individual costs were up to

2000 BDT and 50% of overall costs. The patients causing individual costs above BDT 10000 were responsible for about 18% of the overall expenses.

A total of 49 patients had to be hospitalized with a cost of 17916 BDT on average (median and 25/75 percentiles: 16839 BDT and 7154 BDT / 24727 BDT) (**Figure 4C**). The most expensive inpatient suffered from a fracture and cost 43631 BDT. Thirty (61%) hospitalized patients caused costs that exceeded the limit of 15000 BDT covered by the insurance. The reimbursement of the difference to the total cost was assured by the employer on a voluntary basis.

Of the overall cost 14% was caused by inpatients, 21% was spent on investigations, 30% on drugs, and 34% on consultations at NHN/BADAS outpatient clinics and the factory physician at Knit Asia Ltd Ashulia. The factory physician gave 5188 consultations, which represented one-third of all consultations. For data analysis each of the consultations was valued at 100 BDT, resulting in 8% of the overall cost (**Figure 4D**).

### 3.4 Analysis of Medical Data and Observations



**Figure 5A** shows that patients mostly suffered from gastrointestinal (24.4%), musculoskeletal (18.5%), and ENT infection (14.9%). Around 56.6%, 39.2%, and 4.2% of participants sought medical advice with a chronic condition, acute condition, and both, respectively. Around 93% of participants presented with a single disease, and 43.9% of participants sought medical consultation in winter (November to February),

28.4% in summer (March to June), and 27.7% in monsoon (July to October). A total of 33.9, 25.5, 20.4, 19.2, 12.3, 5.5, and 1.2% of costs were used for the blood test, consultancy, X-rays, urine examination, USG, dressing, and other causes, respectively (**Figure 5B**).

**Table 1. The most commonly used medications**

Drug Category	Local Brand Name	Generic name	Drug Price (BDT/ day)	No of prescriptions
Anti-ulcer	Tab Neotack 150 mg	Ranitidine	2.5	2013
Anti-ulcer	Cap Seclo 20 mg	Omeprazole	5	1580
Anti-ulcer	Cap Cosec 20 mg	Omeprazole	5	1111
Pain reliever	Tab Napa 500 mg	Paracetamol	0.8	1043
Pain reliever	Tab Ace 500 mg	Paracetamol	0.8	936
Pain reliever	Tab Clofenac 50mg	Diclofenac Sodium	1.5	841
Pain reliever	Tab Reservix 100 mg	Aceclofenac	4	814
Antihistamine	Tab Fexo 120 mg	Fexofenadine Hydrochloride	6.5	713
Oral saline	ORS ACI	ORS	5	700
Antihistamine	Tab Deslor 5 mg	Desloratidin	3.5	615
Anti-ulcer	Tab Pantonix 20 mg	Pantoprazole	5	474
Pain reliever	Tab Reset 500 mg	Paracetamol	0.8	470
Antihistamine	Tab Fexofast 120 mg	Fexofenadine Hydrochloride	7	442
Anti-ulcer	Tab Ulcar 150 mg	Ranitidine	2.5	413
Anti-infectives	Tab Filmet 400 mg	Metronidazole	1.2	394
Pain reliever	Tab Ace Plus	Paracetamol & Caffeine	2.5	380
Multivitamin & Multimineral	Tab Filwel Gold	Vitamins and Minerals	9.5	300
Multivitamin & Multimineral	Cap Supravit M	Vitamins and Minerals	3.5	300

Mostly prescribed medications were anti-ulcers, pain killers, antihistamines and multivitamins (**Table 1**).

### 3.5 General discussion

It was possible to successfully implement the core part of the pilot. In spite of some delay, the pilot could be run for one year and the insured garment workers enjoyed health insurance coverage provided by their employer. BADAS managed to meet the increased demand for their medical services by implementing the clinical guidelines and using an adapted diagnostic code list. The software was produced on time to handle medical charts, claiming processes, and data collection. With help of this software, UIC was able to manage the 15354 claims. This allowed to obtain and analyze proper data,

draw conclusions, and make recommendations for future health insurance schemes in the upscaling process.

Nevertheless, the “Nice to Have” items of the pilot failed to properly function. The call center did not play its part as gatekeeper, nor its role as the provider of medical advice for 24 hours and 7 days. The prevention campaign was implemented too late (booklets) or not at all (videos) and did not give any clues as to its impact on changes in health behavior. And finally, the analysis of the demand side survey turned out to be part of doubt if not poor quality despite intensive interactions.

The strong strategic alliance among the partners and their will and dedication to implement this pilot was finally decisive for the successful implementation. A further success factor was the software managing the data collection with the medical provider and the claiming process with the insurance.

### **3.6 Discussion on Insurance Data**

Easy access to health care services could be established by providing health insurance coverage to the garment workers of the New Asia Group of Garments. In fact, 47% consulted medical services during the pilot. Most treatments concerned minor ailments. Half of the patients had only 1 or 2 consultations and 42% of the patients had treatment costs below 500 BDT. Most patients could have afforded to pay themselves for these treatments. Still, the potential introduction of a co-payment would entail an increase in administrative costs and open chances for fraud. The data analysis might give some ideas on how much insurance reimbursements could be reduced by a copayment system. On the other hand, the limitation of the insurance coverage at 15000 BDT appears to be too low as most inpatients' costs exceeded this limit.

The analysis has shown that increasing the insurance limit would not have a big impact on the premium. It would however reassure patients knowing that they are covered even as inpatients without undue exposure to financial challenges. Still, the issue of reinsurance has to be looked at to guarantee reimbursements in case of catastrophes resulting in high numbers of expensive inpatient cases.

The pilot period included in the data analysis the mean medical cost per member per month was estimated at 66.7 BDT (95% CI: 63.0 – 69.4) with truncated insurance coverage at 15000 BDT and 71.2 BDT (95% CI: 66.3-75.1) without limitation, respectively. When calculating any health insurance premium on that basis one has to remember that the health care cost to be reimbursed by any insurance scheme is influenced by:

- the insurance product with the scope of benefits, co-payment, or service provider
- the prices for medical services
- the demography of the insured population
- access to health care services, and
- the health care seeking behavior of the insured population

In addition, the health insurance premium has to cover the running cost of the insurance business. Those consist of:

- the cost for administration, including software, management, and meeting legal aspects
- the cost of marketing
- the premium for re-insurance
- allocation of funds to the financial reserve, and
- some benefits assuring the sustainability of the insurance company.

The fact that individual cost for medical treatment was lower at the beginning of the insured time period resulted in a lower average cost per member per month as long as the insured population is growing. This is to be taken into consideration because when the pace of growth slows the cost will disproportionately increase.

Establishment of clinical guidelines adapted to the local morbidity situation and of a respective diagnostic code system compatible with the ICD-10 classifications allowed to have proper control of the disease spectrum development, its diagnostic requirements, therapeutic management, and on its cost. It permitted us to closely watch the quality of care and the epidemiology of diseases within the garment worker population enabling us to detect a potential threat by epidemics or accidents in time.

Obviously and luckily no epidemic or big accident occurred during the pilot period but anyway has to be taken into consideration in the future when indulging in an upscale project. Such events concern the insurance industry, healthcare providers as well as employers and require preventive countermeasures (e.g., special reinsurance contracts). For example, the low rate of obstetric cases (deliveries, etc.) encountered in the pilot might turn into a threat as a sudden rise in obstetric patients could throw the micro health insurance scheme off balance. The phenomenon needs further attention in order to avoid an unpleasant surprise.

A large number of consultations for musculoskeletal pain in this young population is somewhat alarming and might point to a problem of occupational health that needs proper management (extension of working hours).

#### **4. CONCLUSION**

The pilot insurance scheme conducted differed from existing insurance schemes in Bangladesh. The context in many crucial ways:

- The stratification with limits of insurance coverage defined for each cost group such as drugs, investigations, or consultancies was skipped. Instead, one single limit was set at a high level.
- Inpatient and outpatient treatments were included in the same insurance scheme.
- No co-payment was included.

These peculiarities aimed to create an insurance scheme making a difference to garment workers in terms of better coping with the financial consequences of medical treatment. To assure coverage of basic medical inpatient management, it is recommended to increase the cover limit to at least 25000 BDT or 30000 BDT.

In order to optimize the risk situation for the insurance company through risk pooling mechanisms, mandatory group insurance is recommended as in the pilot. At present, it is too early to already include

the family members of the garment workers. As the family of the garment workers is mostly far away in the villages it would be difficult for the provider to properly identify the entitled users from others.

The pilot insurance scheme only covered medical treatments provided by the medical facilities of BADAS. With the strict application of this rule, the risks of fraud were minimized. Consequently, the insurance scheme with its peculiarities such as medical guidelines, diagnosis codes, electronic medical charts, and handling of the software could well be managed. The capacity and ethics of additional medical providers will have to be carefully evaluated when upscaling the insurance scheme to other factories and regions.

In the context of the pilot, an excellent model software was created that was focused on claiming process and data collection for analysis. The software is based on medical charts for creating claims. When spreading health insurance, one has to very carefully choose the IT solution as it is the heart of running the whole program.

Medical guidelines adapted to the local situation of the insured population and a proper diagnostic code system are prerequisites for a successful health insurance scheme. Stakeholders must know what type of diseases and accidents they will face, and what they have to manage. No insurance scheme will be effective and efficient without dedicated, well-trained, and competent physicians at the frontline willing to follow the treatment lines agreed upon and the rules of the data collection system. The pilot owes a lot of its success to such a well-working group of BADAS physicians in Shafipur, Ashulia, and Mirpur. There was flexibility in the Health Plan due to the understanding between the stakeholders involved which allowed for benefit and loss sharing between the parties.

Finally, the study findings demonstrated that health insurance is a better option for making healthcare accessible to the largest industrial sector in Bangladesh. Nonetheless, our model is intended to analyze and develop a market niche for group health insurance for Bangladesh's garment industry workers and share data, experiences, obstacles, and lessons to learn with a broader health sector development community. We, therefore, call for further prospective follow-up studies, including larger samples and all the possible influences, to confirm our findings.

### **Informed consent**

During data collection, written informed consent was obtained from each respondent prior to the interview.

### **Ethical approval**

The protocol of Insurance Data was approved by the Ethical Review Committee of the Diabetic Association of Bangladesh.

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