




## FINANCING CANCER CARE IN BANGLADESH: AN ALTERNATIVE ROUTE




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### ABSTRACT

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The enormous financial burden of cancer treatment due to lack of any structured financing mechanism results in catastrophic health expenditures as well as impoverishment to many households in Bangladesh. This study attempts to design an alternative mechanism for providing financial protection to cancer patients for receiving necessary procedures (e.g., screening, chemotherapy, radiotherapy, and surgical procedures) based on imposing some levy on mobile phone subscribers using primary and secondary data. The study finds that a monthly fixed levy of BDT 21.5 (USD 0.26) on each active mobile phone subscriber can provide annual financial protection of BDT 500,000 (USD 5,882) to each of 60,000 cancer patients currently seeking treatment from domestic facilities. A fixed levy is always regressive and therefore burdensome for poverty-stricken subscribers. Allocation of the monthly fixed levy on the mobile phone call rate can generate similar worth more equitably. Successful transformation of this idea into action may increase access to cancer care and reduce financial burden as well as disease burden in Bangladesh.

**Contribution/ Originality:** The paper is the first logical analysis of the alternative financing mechanisms of cancer treatments in Bangladesh. This study shows how a small contribution of a large group of people leads to mobilize resources for cancer treatment. This idea can also be used for financing the treatment of other NCDs.

### 1. INTRODUCTION

Bangladesh has gained remarkable success in different health indicators including immunization coverage, maternal mortality, and under-five mortality. The country has also succeeded in achieving health-related Millennium Development Goals (MDGs). However, there are some challenges for attaining Sustainable Development Goals (SDGs) including Universal Health Coverage (UHC). Bangladesh is going through an epidemiological transition with a large reduction in mortality due to acute, infectious, and parasitic diseases and increases in non-communicable, degenerative, and chronic diseases over the last 20 years (Mascie-Taylor, 2012). Non-communicable diseases (NCDs) accounted for 61 % of the total disease burden of Bangladesh in 2004 (Islam & Rahman, 2014). 73.88 % of health care expenditure is financed through out-of-pocket (OOP) payments pushing around 3.4% of households annually into poverty (Hamid, Ahsan, & Begum, 2014; The World Bank, 2017).

According to Health and Morbidity Status Survey 2014, the prevalence of cancer in Bangladesh was 0.71 per 1000 population (Bangladesh Bureau of Statistics (BBS) Statistics and Informatics Division (SID) Ministry of Planning, 2015). In the current population context, the estimated number of cancer patients is about 117,300. According to the International Agency for Research on Cancer (IARC) Fact sheet, 2018 the incidence and five-year prevalence of cancer are 150,781 and 2,42,731 respectively. The most common category of cancer in Bangladesh is oesophagus cancer (13.9%), followed by lip-oral cavity cancer (8.9%), breast cancer (8.5%), and lung cancer (8.2%) (International Agency for Research on Cancer (IARC), 2020). Non-communicable diseases (NCDs), particularly chronic ones including cancer, inflict substantially higher burdens on financial impoverishment due to catastrophic expenditures (Hamid et al., 2014). The health burden of cancer is high. The current mortality of cancer patients is 1,08,137 based on the IARC Fact sheet, 2018 (International Agency for Research on Cancer (IARC), 2020). According to the WHO NCD country profile, NCDs are estimated to account for 67% of all deaths in Bangladesh; among them, 12% are caused due to cancer (World Health Organization, 2018). The financial burden of cancer is also enormous. Many of these patients bear catastrophic health expenditure. The headcount impoverishment impact of OOP payments is 12.5 % for cancer patients (Hamid et al., 2014). The typical sources of this massive financing include personal savings, selling of land and other properties, loan/borrowing, and charity (Ahsan, Hamid, & Barua, 2012). Thus, Bangladesh needs to think about introducing some alternative mechanisms for sustainable financing of such a burdensome chronic NCD. Health insurance is a proven tool worldwide to provide financial protection against health shocks. However, voluntary health insurance often fails to cover chronic NCDs by excluding any pre-existing conditions. Some insurance companies, especially in India, offer voluntary insurance for cancer and cover the conditions that develop after purchasing the policy (My Insurance Club.Com, 2018; Policyx.com, 2018). A term life insurance policy in Singapore provides some protection for care (Uincome, 2018). A group health insurance scheme for physicians in Canada covers cancer care to some extent (OMA Insurance, 2016). It is known from a key informant that Pragati Life Insurance Ltd in Bangladesh designed a voluntary insurance package in Bangladesh for cancer care. Nevertheless, due to poor insurance culture along with the negative perception and lack of infrastructure including the regulatory restrictions, there is little scope for voluntary health insurance practice to bloom in Bangladesh. Compulsory or group health insurance is mainly applicable to the employees of the formal sector due to their affiliation with the organizations. The administrative cost of premium collection for compulsory insurance is also minimal. The country is not ready yet to introduce compulsory health insurance for all sections of the people due to the large informal sector and the small size of the economy. However, we can exploit the opportunity of a vast number of mobile phone users as they belong to a group by registration. Currently, there are about 166.028 million mobile phone subscribers in Bangladesh (Bangladesh Telecommunication Regulatory Commission (BTRC), 2020). Although some innovative ideas (e.g., sin tax on tobacco and alcohol consumption, and special levy on non-essential commodities) are already in practice in some parts of the world (Philippine and Ghana respectively) to support the government-initiated health insurance schemes, this paper provides a new idea of designing a health insurance package for cancer care using the group nature of mobile phone users. This innovation may be useful for making cancer care affordable in Bangladesh and other low-income countries. This paper sketches out the benefit ceiling and associated premium level along with the necessary procedures needed to administer the benefit packages including the enrolment process. The next section illustrates the methodology followed by benefit-packages. The fourth section explains the enrolment process and methods of administering the benefit. The fifth section describes the premium determination method. The final section offers discussions and conclusions.

## 2. METHODOLOGY

For designing benefit package and determining the level and sources of financing, we used four major types of information: (i) incidence and prevalence of cancer, and the actual number of patients currently undergoing

treatment from domestic sources in Bangladesh; (ii) costs incurred by the patients for treating cancer; (iii) available infrastructure and human resources for managing cancer; and (iv) number of mobile phone subscribers.

We obtained the incidence and prevalence of cancer from secondary sources, especially from the IARC Fact Sheet and other published documents. The information regarding mobile subscribers is available on Bangladesh Telecommunication Regulatory Commission (BTRC) website. Infrastructure and human resources-related data were obtained mainly from key informant interviews.

The data regarding treatment cost was obtained from the patient surveys and consultation with the experts. We interviewed patients from both public and private facilities including Bangabandhu Sheikh Mujib Medical University (BSMMU), National Institute of Cancer Research and Hospital (NICRH), Dhaka Medical College Hospital (DMCH), and Ahsania Mission Cancer and General Hospital (AMCGH). These are the major health care facilities rendering cancer care in the country. Due to resource constraints, instead of a representative sample, we used an indicative sample of at least 30 patients for each of the 7 varieties of cancer. Hence, a total of 262 cancer patients were interviewed.

A semi-structured questionnaire was used for patient interviews. This questionnaire included socioeconomic and demographic variables, types and stages of illness, duration of illness, cost incurred for seeking treatment, sources of financing, etc. Two Research Assistants administered the questionnaire after getting informed consent from the respondents. The study received ethical approval from the Institutional Review Board (IRB) of the Institute of Health Economics, University of Dhaka. Informed consent was sought during the interview.

We conducted several consultation meetings with some key informants including oncologists. We also organized a round table discussion with oncologists. From these consultations and round-table discussions, we obtained information, such as the existing number of health care facilities for cancer treatment and associated human resources and equipment. Moreover, we obtained some information for expanding the facilities to make these services available at major administrative tiers (divisional and the district level). We also tried to find out the actual number of cancer patients currently receiving treatment from the existing facilities.

### 3. BENEFIT PACKAGE

The findings of the patient survey show that a cancer patient needs to face a total cost of BDT 639,835 (USD 7,527.5)<sup>1</sup> annually, on an average, which includes charges for consultation, diagnosis, surgical or therapeutic procedures, drugs and injectable, and transport and lodging of the patient and/or attendant(s). The annual average cost of treatment ranged from BDT 492,008 (USD 5,788.3) for cervical cancer to BDT 810,446 (USD 9,534.7) for colon cancer (not shown in table). This includes both direct medical costs and non-medical costs like transport and lodging of the patient and/or attendant(s). However, the respondents could not report direct medical and non-medical costs separately. There may have some recall bias of the cost articulated by the respondents.

Surgery, chemotherapy, and radiotherapy are the commonly used procedures for cancer treatment in Bangladesh and, hence, these services were included in the benefit-package.<sup>2</sup> All of the oncologists who attended the consultation meeting agreed upon the cost of cancer treatment in a public setting in Bangladesh as BDT 25,000 (USD 294.1) for a radiotherapy session, BDT 20,000 (USD 235.3) for a chemotherapy session, and BDT 60,000 (USD 705.9) for a surgical procedure. This is to note that it requires one radiotherapy session and/or 6 chemotherapy sessions with or without a surgical procedure for a cancer patient. The expert opined that about 50 % of cancer patients, irrespective of the types, require all three treatment modalities, 20 % need any two modalities and a single modality is required for the remaining 30 %. It requires a maximum of BDT 200,000 (USD 2,352.9) if a

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<sup>1</sup> Considering 1 USD = BDT 85.

<sup>2</sup> The other procedures and techniques of cancer treatment such as targeted therapy, immunotherapy, stem cell transplant, hyperthermia, photodynamic therapy, blood transfusion and donation, hormone therapy and precision medicine were not considered in benefit package.

cancer patient needs to undergo all the treatment modalities in the public facilities. However, expenditure is much higher if one opts for private facilities. Thus, we considered the expenditure reported by the patients to fix the benefit ceiling. It was found from the survey that the annual median expenditure for a cancer patient is about BDT 507,000 (USD 5,964.7). Hence, the annual benefit ceiling for a cancer patient can be fixed at BDT 500,000 (USD 5,882.35) for a particular episode of cancer. This is to be noted that, BDT 500,000 (USD 5,882.35) covers 100% of the average annual expenditure of 43.19% of patients, 50% or more of the average annual expenditure of 21.93 % of patients, and 25% or more of the average annual expenditure of 21.93% of the patients See Table 1.

**Table-1.** Annual average expenditure of cancer patients as a percentage of proposed sum insured worth of BDT 500,000.

Percentage of expenditure covered by the proposed sum insured worth of BDT 500,000	Percentage of cancer patients
100% expenditure covered by proposed sum insured worth of BDT 500,000	43.19
50% or more expenditure covered by proposed sum insured worth of BDT 500,000	21.93
25% or more expenditure covered by proposed sum insured worth of BDT 500,000	21.93

As per expert opinion, the prevalence of the different types of cancer patients was 145,000 in 2018. However, some 60,000 patients usually seek care from domestic providers. Currently, the existing capacity including 15 radiotherapy machines and 200 oncologists can serve about 25,000 patients (Hasan & Jahan, 2017). As per the international standard, every 10-cancer patients need one oncologist. Nevertheless, the expert opined that we need at least 1,000 oncologists for serving the existing number of patients. Thus, the country needs to increase the capacity in terms of both physical and human resources to a greater extent to serve the existing number of cancer patients. This is to note that the government has already taken initiatives to establish a 100-bed cancer hospital in each of the eight Divisional cities. The emphasis needs to be given to early detection as it reduces fatality as well as economic consequences. Visual Inspection of Cervix with Acetic Acid (VIA) is a cost-effective method for detecting cervical cancer. An effective breast cancer-screening program includes breast self-examination, an examination by a physician, and an ultrasound/a mammography test. Oral cancer is preventable and both the precancerous and invasive lesions can be picked up easily by examination of the oral cavity. Population-based organized screening is an effective approach for early detection of all these cancer diseases.

**4. ENROLMENT PROCESS AND ADMINISTERING THE BENEFIT PACKAGES**

The beneficiaries can be enrolled right after diagnosis and benefits may be administered subject to the utilization of services. Hence, those who seek care from the health facilities available in the country are the primary beneficiaries of the scheme. This is to note that providing the benefit to those who are currently not seeking treatment or seeking treatment abroad is not feasible in the short run. Thus, as depicted above, the primary beneficiaries of the scheme are about 60,000 cancer patients. After diagnosis, the hospitals need to send detailed information including the proof of diagnosis, NID, and/or birth certificate to the insurer for issuing an annually renewable smart card with an automatic updating facility to each patient. It needs to be established a swiping machine in each accredited hospital with a central server that can provide the updated information regarding the utilization of services to each patient, the corresponding provider, and the insurer. An accreditation committee needs to be formed to prepare an accreditation policy as well as a list of accredited hospitals (public, private, and NGO) from which the eligible patients can receive treatments. The hospitals should prepare the bills on monthly basis and send them to the insurer for reimbursement. The system needs to be established in such a way that the hospital will provide cashless services to the beneficiaries until exhausting the benefit ceiling. The hospital will continue the services, if necessary, by charging the patients after exhausting the benefit ceiling.

## 5. PREMIUM DETERMINATION

The premium or contribution/levy usually depends on the probability of illness and coverage for treatment per case plus loading factor (i.e., administrative cost, tax, and profit margin). As the benefit is supposed to be channeled through the utilization of services, we considered 60,000 cancer patients as beneficiaries who seek treatment from domestic facilities. As mentioned above, the annual coverage for a particular cancer treatment is BDT 500,000 (USD 5,882.35). The estimated total outlay for providing coverage to the cancer is BDT 30 billion (USD 352.94 million) See [Table 2](#). We roughly considered 10% of the total outlays as administrative costs including the establishment cost, which amounts to BDT 3 billion (USD 35.29 million). The total outlays including loading cost amount to BDT 33 billion (USD 388.24 million). Considering 15% VAT the insurer needs to earn BDT 37.95 billion (USD 446.47 million). As discussed earlier, the effective implementation of an organized screening program for breast, cervical, and oral cancer is required with the management of cancer. The estimated total costs for the VIA test for all the women aged 30-60 years is about BDT 84 crore (USD 9.88 million). No additional costs are required for breast and oral cancer screening if existing resources are mobilized and used efficiently. This is to note that, in the operation plan, the government has kept a provision of BDT 2.43 billion for the screening of major NCDs including breast & cervical cancer, and BDT 0.245 billion for oral cancer screening. Thus, there is not much additional financial implication for the effective implementation of organized screening programs for breast, cervical, and oral cancer.

**Table-2.** Estimated outlays for providing coverage to cancer patients undergoing dialysis.

Entities	Amount of coverage (BDT)	Number of beneficiaries	Total outlays (Billion BDT)
Coverage for a particular cancer treatment	500,000	60,000	30.00
Administrative cost including establishment cost (10% of the total coverage)			3.00
Total outlays including loading costs			33.00
VAT (15% of the total revenue to be earned)			4.95
Revenue needs to be earned to provide the coverage including VAT			37.95

The total number of mobile phone subscribers, as seen in [Table 3](#), was 166.028 million in August 2020 (Bangladesh Telecommunication Regulatory Commission (BTRC), 2020). If these expenses are financed through imposing a levy on active mobile phone subscribers (which was considered as 150 million as per expert opinion) then each subscriber needs to pay monthly BDT 21.5 (USD 0.25). Thus, if a monthly fixed levy of BDT 22 (USD 0.26) is imposed then at least BDT 39.6 billion (USD 465.88 million) may be earned annually as revenue.

**Table-3.** The mobile phone subscribers in August 2020.

Operator	Subscriber (in million)
Grameen Phone Ltd. (GP)	77.011
Robi Axiata Limited (Robi)	49.784
Banglalink Digital Communications Limited	34.578
Teletalk Bangladesh Ltd. (Teletalk)	4.655
Total	166.028

Source: Bangladesh Telecommunication Regulatory Commission (BTRC) (2020).

A fixed levy is always regressive and therefore burdensome for poverty-stricken subscribers. Alternatively, a similar amount or more can be earned through a progressive technique by allocating the monthly fixed levy on the call rate. Higher revenue will be required with the increasing capacity of the country to serve more patients. This can be coped with by imposing a levy on Internet Subscribers. There are 108.188 million Internet Subscribers in the country of which the overwhelming majority (99.618 million) are mobile Internet Subscribers (Bangladesh Telecommunication Regulatory Commission (BTRC), 2020). Imposing an earmarked tax on tobacco products is another alternative to cope with the additional costs. This has an added advantage by controlling tobacco

consumption, which is a major risk factor for lung and other types of cancer. According to the experts, the volume of the tobacco tax in Bangladesh (FY2018–2019) is about BDT 228.4 billion (USD 2.69 billion). A 5% increase in tobacco tax may generate revenue of BDT 11.42 billion (USD 134.35 million), which is adequate to provide benefit to additional 22,840 cancer patients. Moreover, the government allocated BDT 01.10 billion (USD 12.94 million) in FY 2020–21 to the Ministry of Social Welfare to provide financial assistance to chronic conditions, such as cancer, kidney diseases, liver cirrhosis, stroke-related paralyzed and congenital heart diseases (Ministry of Finance, 2020). If cancer is covered through the insurance mechanism as described above, a part of this allocation can be diverted to the insurance fund.

## 6. DISCUSSIONS AND CONCLUSIONS

This study focuses on designing an insurance mechanism to finance cancer treatment (chemotherapy, radiotherapy, and surgical procedures) based on some innovative financing tools, especially imposing some levy on mobile phone subscribers. The findings show that a monthly fixed levy of BDT 22 on each active mobile phone subscriber or allocating this amount on call rate can provide financial protection of BDT 500,000 (USD 5,882.35) to each of the 60,000 cancer patients currently seeking treatment in the existing facilities. A substantial amount of money can also be accrued by imposing a levy on 99.428 million Internet Subscribers and/or increasing tobacco tax to some extent. Despite some limitations of data, the findings of the study are useful for policy discussions to introduce insurance for cancer care in Bangladesh. The country requires at least 800 additional oncologists to serve the existing number of cancer patients. The experts claim that the country produces, on average, 100 oncologists per year. As an interim solution, they recommend introducing a six-month-long training program for physicians on oncology who can assist the oncologists. In addition to regular maintenance of the existing radiotherapy machines, they additionally suggest setting up radiotherapy centers in the medical college hospitals. The experts also express their opinion to introduce screening services regularly in the district and upazila levels for the prognosis of cancer in the early stage. The procedures need to follow immediately for materializing the insurance mechanism stated above are depicted below: orienting the existing state-owned insurance body (e.g., Sadharan Bima Corporation in Bangladesh) or establishing a new one; consultations with telecommunication regulatory authority (e.g., BTRC in Bangladesh) and mobile operators to come to an agreement for imposing levy on the call rate; channelizing fund and accomplishing other necessary procedures; preparing a list of eligible facilities providing cancer treatment; equipping the health facilities to collect necessary documents including NID and/or birth certificate of the diagnosed patients; setting up an automated system by issuing annually renewable smart card to each eligible patient, installing a swiping machine at each facility and other mechanisms including a central server; developing a payment mechanism to reimburse the hospitals providing the cancer treatment (i.e., chemotherapy or radiotherapy with or without surgical procedures); and establishing a proper grievance redress mechanism.

The insurance mechanism can start its functioning within a short time if immediate attention is provided to administer the procedures listed above. Sadharan Bima Corporation, a state-owned general insurance company in Bangladesh, is interested to introduce such an insurance scheme. Successful accomplishment of such a scheme may increase access to treatment and reduce financial burden (by cutting off out-of-pocket payments) as well as disease burden (by diminishing severity of illness and mortality). This may also be a route of enhancing the infrastructure including physical and human resources for providing cancer treatment in the country.

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