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Cost Burden of the Disease on the Indian Health Sector and the Healthcare Utilization Patterns among Households in Goa

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Abstract

There has been an alarmingly increasing trend in the prevalence of non-communicable diseases (NCDs) in the Indian economy. These transformations pose great challenges to the country in terms of the rising healthcare costs which further impact the rate of savings and investment for an individual as well as the capital formation of the country at large. This paper uses a sample of 400 goan HH to evaluate disease-specific direct and indirect costs attributable to the NCDs-Diabetes, Cancer, Cardiovascular, and Chronic Kidney Disorder (CKD). Apart from analyzing the cost burden associated with these chronic and long-term illnesses the paper also analyses healthcare utilization patterns, i.e., Public Sector versus the private sector and the quality factors that drive individuals and households to make their choices. In terms of direct cost, the highest burden was found to be for CKD followed by cancer, diabetes, and lastly cardiovascular disease (CVD). For the indirect cost, the highest burden was posed by cancer followed by CVD, diabetes, and lastly CKD. The study finds that the choice of government healthcare is driven by factors such as proximity, cost, and efficiency. The choice of private healthcare is mainly driven by factors – privacy, less waiting hours, and timely treatment. When the sampled respondents choose, a combination of both private and public health care the main factor that drove this choice were that of clean environment, proximity, and less waiting hours.

Keywords: Cost burden, Healthcare utilization, Non-communicable diseases, Quality factors

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Introduction

Lifestyle diseases are linked by the way people live their lives including their dietary habits, physical activity, and consumption of harmful substances among other factors. Some aspects that cause lifestyle diseases can be controlled, while there are others that are beyond the control of an individual such as those that are hereditary. The main cause of these diseases is unhealthy eating habits, stress, consumption of alcohol, environmental conditions, and constant drug intake which are among the many causes of lifestyle diseases. The common lifestyle diseases include heart disease, stroke, obesity, hypertension, type I and II diabetes, asthma, and depression. According to the statistics by the global disease burden study for diabetes (2018),[1] the prevalence of diabetes in the state of Goa was 57.4% in 2016. The global disease burden study for cancer (2018)[2] showed that, in 2016, the crude cancer rate was 52.5%. The global disease burden study for cardiovascular diseases (CVDs) (2018)[3] indicates that the prevalence rate was high for the state of Goa. Finally, for chronic kidney disorder (CKD), there is dearth of state level disease statistics; however, the national statistics data according to the global disease burden study (2017)[4] assert that the mortality rate due to CKD was 46.5% in 2017. The data show an alarming rate of prevalence of non-communicable diseases (NCDs) in the state of Goa. These have an enormous impact on our health as well as on the rising health costs. Capital or machinery have escalated our chances of lethargy and slothful behavior. Lack of physical activity by children and adolescents, besides, the sedentary jobs that people perform for long hours without any major body movements puts them at a greater risk of such a malady. As such, it becomes important to understand the severity of the problem. Rising health expenditures affect the rate of savings and investment for an individual at a micro level, but have an impact on the capital formation of the country at large. According to the study by Nguyen *et al.* (2012) [5] households in the light of financial burden posed by NCDs would delay investment as a coping strategy. Although there is very limited empirical literature on the impact of a household's investment decisions, delayed investment as a coping strategy provides a strong foundation for this causality. India's health spending as a percent of GDP was nearly 2.1% (India Union Budget, 2022)[6] which is very low compared to most nations. The low level of public spending has been found to be persistent in India which places greater burden on household level out-of-pocket expenditures on health (Hemming, 2020).[7] By understanding the severity of the problem, we need to examine the role of the public and the private health sector in meeting these new health challenges and combating the surge of these in the near future. Although individual's per capita income in Goa is high, yet there is a major chunk that does not receive timely and adequate treatment, either due to inaccessibility or lack of affordability. Although the per capita income in Goa is among the highest in the country standing at Rs. 435,959 in 2019–2020 (India Ministry of Finance, 2022),[8] yet there is a major chunk that does not receive timely and adequate treatment, either due to inaccessibility or lack of affordability (Verma *et al*., 2021).[9]

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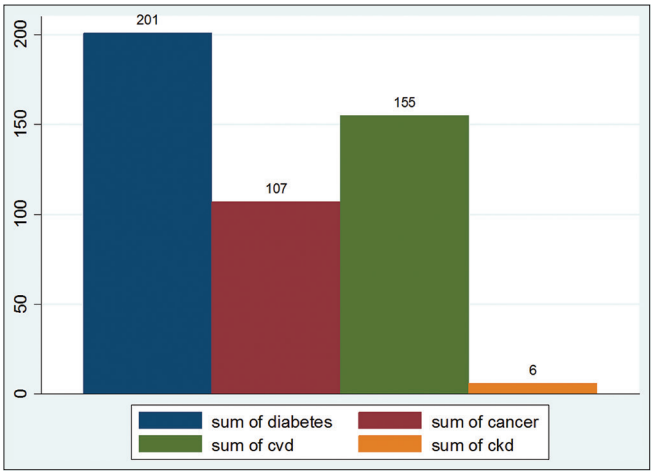


Figure 1: Depicting the disease distribution among the sampled population

Literature Review

Literature suggests that the NCD burden is constantly increasing in our economy. Today, it is not only a burden to the affluent groups of the nation, but it is slowly penetrating to the lower and vulnerable sections of the society. As such, the public health policy should aim at controlling these not only among the elderly but also among the children and adolescents, thus reducing the pressures of finance on the exchequer. According to the data of the India State-Level Disease Burden Initiative Collaborators (2017),[10] the estimated percentage of deaths due to NCDs in India increased from 37.9% in 1990 to 61.8% in 2016. The four major NCDs that led to this disease burden are CVDs, cancers, chronic respiratory diseases, and diabetes. The study showed that there has been an alarming increase in hypertension, diabetes ischemic heart disease, CVD, cancer, etc., all leading to a high morbidity and mortality. The statistics of the report show that, in 2016, alone NCDs accounted for 70.9% of the total disease burden in Goa. The leading causes of Disability Adjusted Life Years (DALYs) in 2016 among the NCDs were ischemic heart disease (11.0%) and diabetes (4.1%) followed by chronic obstructive pulmonary disease (COPD) (4.1%) and stroke (4%), while CKD accounted for 2.3% of the DALYs in the same year. Compared to the 1990s, these figures are high whereby, DALY in 1990 for ischemic heart disease (5.6%), diabetes was 1.2%, COPD was 2.6%, and stroke accounted for 2%, while CKD was 1.3%. Goa is getting swamped up in the web of lifestyle diseases such as diabetes, hypertension, obesity, digestive problems, heart diseases, and stress.

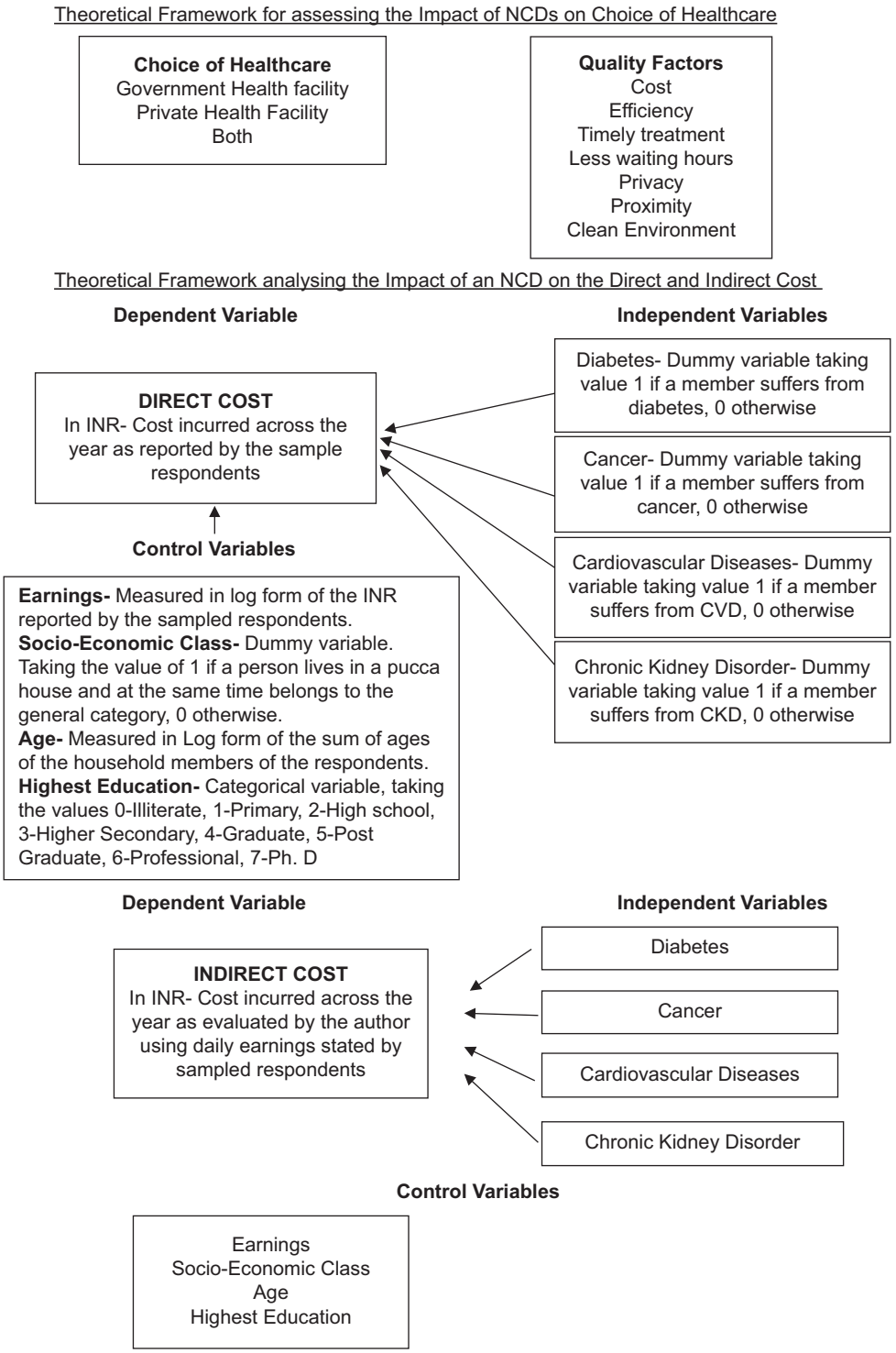
Disease Burden – DALY, Direct Cost, and Indirect Cost

Jan *et al*. (2018)[11] draw attention to the devastation caused by NCDs and that if timely action is ignored that it could cause a huge loss and burden to the society. Old-age morbidity is a cause of worry in India. The elderly (60+ years) are moving toward these NCDs-CVDs, cancer, chronic respiratory diseases, and diabetes that could have disastrous consequences in terms of impoverishment of families, excess mortality, lowering of investment, and consequent deceleration of economic growth. Joseph and Gupta (2016)[12] assessed the economic impact of NCDs among patients in a private tertiary care hospital in Mangalore. The study found the mean duration of hospital stay of the respondents to be 44.4 ± 35.8 days. It, further, states that the total cost incurred by all patients was Rs. 365,600, of which direct cost amounted to Rs. 214,100 (58.6%), while indirect cost amounted to Rs.151,500 (41.4%). It was also seen that the average direct cost and total cost were higher in the age group 50–59 years, while indirect cost was greater in the age group 40–49 years. Engelgau *et al*. (2012)[13] analyzed the economic impact of NCDs on households in India, thus revealing that the out of pocket expenditures increased for household's overtime from 31.6% in 1995–1996 to 47.3% in 2004. The major source of funding were household own savings and income (40–60%), whereas 30–35% was from borrowing. Within the major NCD categories, out of pocket expenses per hospital stay and per outpatient visit were particularly high for cancer, heart disease, and injury. Muka *et al*. (2015),[14] in their systematic review, found that of all the NCDs so selected cancer and CVD had the highest reported mean annual total direct costs.

Quality Factors that Drive the Choice of Healthcare

There are several studies that seek to examine the healthcare utilization patterns of patients. Bhattacharyya *et al*. (2017)[15] undertook a cross-sectional study to assess the factors that were the drivers of choice of healthcare in Udupi taluka of Karnataka. Health care financing is a major issue in India, wherein 80% of health care is provided by the private sector. The authors found that the health care preference for private hospitals is 60%. This can be attributed to the fact that there are better government health facilities in the region under study. Analysis revealed that health insurance and distance to the health center are the two main predictors for outpatient health care utilization for NCDs. Residence, insurance, health-care provider preference, income, education, waiting time, and distance to the health center significantly impacted their choice. Studies by Sahoo and Madheswaran (2014),[16] Harpham and Molyneux (2001),[17] and Borah (2006)[18] have found that price and distance are significant in determining the choice. The study by Boachie (2016)[19] has found waiting time to be an essential factor driving the choice of healthcare. Efficiency has also been found to be an important factor driving the choice of healthcare based on studies by Iles (2013),[20] Ngangbam and Roy (2019),[21] Basu *et al*. (2012),[22] and Ravi *et al*. (2016).[23] Other factors such as waiting time, privacy of medical examination, cleanliness, and sufficient treatment time have been found to be significant drivers as per studies by Kumari *et al*. (2009)[24] and Musyoka (2019).[25]

Efforts by our country and the state are to reduce the burden of NCD's, but despite these developments why does the out-of-pocket expenditures increase for an individual or a household? Do NCDs lead to catastrophic health spending? Does it have an economic impact? Why do people prefer private services over a public health program? What are the reasons for satisfaction or Dissatisfaction? Does the NCD burden lead to a loss of productive days, thus reducing the quality of life of the individual/household? These are some of the few questions that still need to be answered despite the vast literature and research that is conducted in this aspect. Given the population of the State, awareness about NCD's, the various services offered by the government, and the procedures of availing them need to be notified to the masses



especially those who are in isolated areas, where technology is a major barrier. The task at hand is to periodically analyze the out of pocket expenditure of households and the kind of health care services.

Methodology

The classification of NCDs in the present study followed the classification adopted by the WHO in Global Burden of Disease Studies, (2004).[26] A survey method was used to collect the required data from a sample of 400 households across the state of Goa. The sample size was estimated using the Krejcie and Morgan statistical power analysis (1970).[27] The findings for the study were based on the analysis of the collected primary data. The samples chosen were administered a questionnaire adapted from the WHO-STEPS[28] questionnaire and other similar questionnaires. The sample represented various income groups, locations, and ages across the state.

The study defines direct cost as a sum of total medical expenditure that includes the sum of medicine costs, cost of hospitalization, and laboratory tests for 1 year and total travel cost to the clinic including transportation expenses and parking fee. Indirect cost in this study is defined as loss of income of the patient as well as the caregiver on account of the medical condition, which visits to the clinic and duration of hospitalization. In terms of healthcare utilization, a dummy variable was used. At first the study analyses, the percentage distribution of direct and indirect cost based on the healthcare utilization pattern and subsequently it delves into the disease-specific healthcare utilization patterns among the sampled households.

Sample Population-Descriptive Statistics

Among the 400 households of Goa that were surveyed, 50.25% were ailing with diabetes, 26.75% of the households had a member ailing with cancer, 38.75% of the sampled respondents were afflicted with cardiovascular diseases, and 1.50% were afflicted with CKD. Figure 1 shows the diagrammatic distribution of the disease burden among the sampled households. It must also be noted here that the lower percent for CKD is due to the fact that CKD was seen in conjunction with diabetes among the sampled population. With reference to socioeconomic class, it was observed that 76% of the population belonged to the general category, while 24% belonged to the category of scheduled class, scheduled tribe, and other backward class. Considering the education component, 17% were graduates, 44.5% had completed higher secondary school and about 2.25%, and a small number were PhD holders.

Results and Discussion

As expected that the cost is highest for households opting for private healthcare and lowest for those opting for government healthcare services. As for the indirect cost, it was seen that it was the highest for households choosing combination of private and government healthcare followed by private and least for government. This was an anomaly considering indirect costs account for foregone wages of patient and caregiver and due to visits and hospitalizations. One would expect this to be the lowest for private given the relatively lesser treatment in waiting hours. In the case of the sampled population, however, the differences in the indirect cost were attributable to the healthcare utilization pattern based on the number of members with NCDs in the household. Table 2 shows that within households that have greater number of members suffering from NCD the choice of healthcare is more centered toward private or a combination. We also know that in households with greater number of members with NCD, the indirect costs would be higher.

Subsequently, the study looks at the quality factors that drive the choice of healthcare in the sampled goan households. The quality factors considered were cost factor, proximity, efficiency, clean environment, privacy, timely treatment, and less waiting hours. Figure 2 shows how the households chose the healthcare pattern based on quality factors mentioned.

When analyzing the choice of healthcare under the various types of quality factors, the study finds that the choice of government healthcare is primarily driven by the quality factors of proximity to residence, cost, and efficiency based on the respondents of the surveyed sample. The choice of private healthcare is mainly driven by the factors such as privacy, less waiting hours, and timely

Table 1 : Average direct and indirect cost

Choice of healthcare	*Average direct cost (INR)*	*Average indirect cost*
Government healthcare facility	109,840	7708
Private healthcare facility	190,525	19,159
Combination of government and private healthcare facility	151,178	37,783

Author's calculation

Table 2: Choice of healthcare and total number of members with non-communicable disease within a household

Choice of healthcare	*Number of members ailing with an NCD within a household*	*Sum of total number of members with NCD*
Government	1	131
	2	52
	3	15
	4	4
Private	1	152
	2	82
	3	15
	4	4
Combination of government and private	1	30
	2	12
	3	3

Author's calculations, NCD: Non-communicable diseases

Table 3: Total economic disease burden

Disease	*Direct cost (INR)*	*Indirect cost (INR)*	*Economic burden per patient per annum (INR)*
Diabetes	38,854.10	8176.82	47,030.92
Cancer	151,108.70	25,759.06	176,867.76
CVD	34,203.06	13,116.43	47,319.49
CKD	767,865.90	1495.18	769,361.08

Author's calculations, CVD: Cardiovascular disease, CKD: Chronic kidney disease

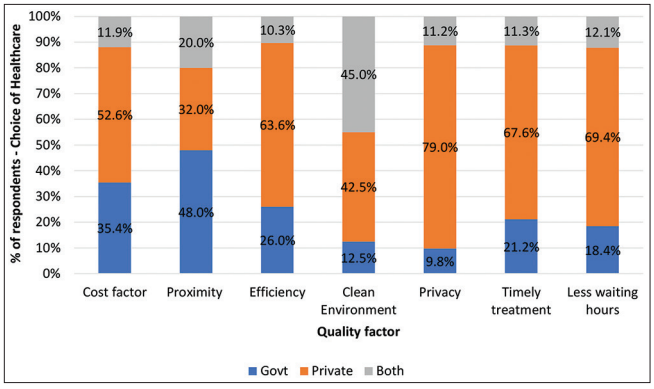


Figure 2: Depicting the choice of healthcare under various quality factors

treatment. In the case, where the choice of the respondent is both, the primary quality factors leading to this choice comprise clean environment, proximity, and less waiting hours.

The study, now, looks at the healthcare utilization pattern based on the diseases afflicting the households among the sampled population.

On analyzing healthcare choice by disease, it was found that, for diabetes, the leading choice was private healthcare with 46.8%

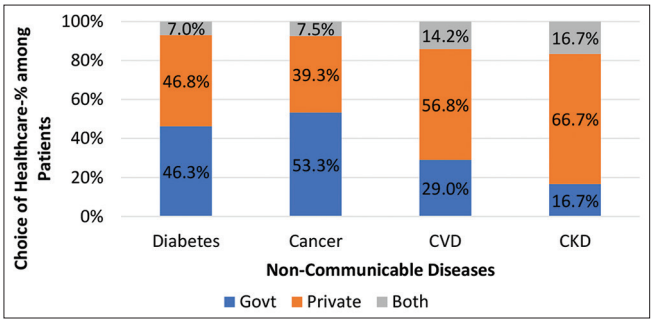


Figure 3: Depicting the choice of healthcare among the respondents by disease

of the respondents opting for this mode followed by government (46.3%) and lastly both (7%). Thus, the choice in mode of healthcare for diabetes is almost same for public and private facility. In the case of cancer, the leading choice was government hospitals, where 53.3% of the patients opted for this mode, followed by private (39.35%) and both (7.5%). When considering CVD, it was seen that 56.8% of the respondents opted for a private health facility, followed by 29.0% opting for a government healthcare facility and 14.2% of the respondents opting for both. The study concludes that for CKD, the leading choice was private healthcare facility taking a share of 66.7%, followed by government, that is, 16.7% and a combination of both also being 16.7%. Figure 3 depicts the healthcare utilisation patterns of the respondents by disease.

Having seen the healthcare choice patterns and the quality factors, the study, now, looks at the economic burden of disease among the sampled respondents.

Based on the healthcare choices, the direct and indirect cost faced by the sampled population is detailed out in Table 1. To arrive at the total economic burden using the sampled responses, we estimate the per capita economic burden of each of the NCD. Disease-wise per capita economic burden is depicted in Table 3. Annually, the highest per capita disease burden is that of CKD leading to an additional cost of Rs. 769,361.08. This is followed by cancer which has an annual per capita disease burden of Rs. 176,867.76. CVD ranks next with the per capita annual disease burden of Rs. 47,319.49, followed by diabetes with Rs. 47,030.92.

Conclusion

The study finds significantly higher direct cost associated with the choice of healthcare with the highest for private, followed by combination of government and private healthcare facility and lowest for government healthcare. In case of indirect cost, it was seen that the cost differences are driven by choice of healthcare in the light of the number of members afflicted with the disease in the Household. For the diseases – diabetes, cancer, CVD, and CKD the direct cost were found to be Rs. 38,854.10, Rs.151,108.70, Rs. 34,203.06, and Rs. 767,865.90, respectively, based on the results of the sample. Meanwhile, the indirect costs for the same illnesses, that is, diabetes, cancer, CVD, and CKD were found to be Rs. 8,176.82, Rs. 25,759.06, Rs. 13,116.43, and Rs. 1,495.18, respectively. The study finds that the more the number of members with NCDs more driven is the choice towards combination of private and public healthcare facility or only private healthcare options. Households with greater number of members have a bearing on the indirect costs. In analyzing the choice of healthcare under the various types of quality factors, the study finds that the choice of government healthcare is driven by factors such as proximity, cost, and efficiency. The choice of private healthcare is mainly driven by factors – privacy, less waiting hours, and timely treatment. When the sampled respondents choose, a combination of both private and public health care the main factor that drove this choice were that of clean environment, proximity, and less waiting hours.

On analyzing healthcare choice by disease, the study finds that, for diabetes, the leading choice was private healthcare (46.8%), followed by government (46.3%) and lastly a combination (7%). In the case of cancer, the leading choice was government hospitals (53.3%), followed by private (39.35%) and both (7.5%). When considering CVD, it was seen that respondents opted for private health facility (56.8%), followed by government healthcare facility (29.0%) and 14.2% of the respondents opting for both. In the light of the above results, the economic burden of diseases was calculated, where annually the highest per capita disease burden was in the case of CKD followed by cancer, CVD, and lastly diabetes. The prime objective of identifying healthcare sector challenges can be achieved from assessing the choice of households in the light of the quality factors that drive their decision. Only 12.5% of the sampled households chose government hospital when considering the quality of clean environment. This points to the need toward increasing the hygiene and cleanliness of the government facilities. Subsequently, only 9.8% of the households chose government hospital in the light of privacy being a quality factor. This indicates that government facilities must increase their capacity of bedding and doctors available to ensure that patients coming into government facilities can enjoy a greater degree of privacy. Among the sampled households, only 18.4% of the respondents chose a government facility considering the quality of less waiting hours. This again signifies the importance of government healthcare increasing their capacities such that patients do not have to wait for longer hours to seek treatments.

There is much more research needed in the light of healthcare capacities for various diseases to be able to understand and decipher the precise changes needed in the healthcare system so that the country is able to cope with the increasing disease burden of NCD.

Ethical Declaration

The ethical approval for this study was granted by the Directorate of Health Services, Government of Goa.

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