Patients Satisfaction and Role of PHCs: A comparative study of two districts of North Bengal

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Abstract

This paper is a search for the present condition of Primary Health Centres (PHCs) of two districts of North Bengal and how much the inhabitants are satisfied by the services providing by PHCs. The study looks for to understand the disease profile including minor illness, hospitalization, situation of maternal and child health, non-communicable diseases and mental health of these districts. Except price and quality effects, what other factors also affect healthcare choices is another part of health seeking behaviour. The role of education, age, duration of illness, and so forth, provide important insights into the potential opportunities and limitations of public policy to affect patterns of demand. This will help us to understand the health seeking behaviour of the inhabitants and to identify the barriers to access healthcare services encompassing social, physical and economic aspects.

Key Words: Primary Health Centres, Price & Quality Effects, Public Policy, North Bengal.

Introduction:

Healthcare is fundamentally different from usual commodities like food, clothing and shelter. Health goods are not homogeneous in nature, as a result the market clearing situation at some part does not imply that absence of imperfection in others. Individuals are able to choose from a set of alternative providers, where each provider choice leads to a potential improvement in the expected health for both monetary and non-monetary prices. Considering this, a rational consumer tries to choose the alternative which yields highest utility. The literature on healthcare is not only confined to the qualities of healthcare use, but also extends to the quality of service provided by them. Performance of the health sector is a very important indicator of human development index of a society. Productivity factor of a society is severely affected by the poor health condition. For development a healthy population with productive workforce is the minimum precondition. It is important to differentiate how poor and non-poor consumers of health services make decisions about treatment. The publicly provided health facilities have some common features like higher-tier hospitals or health units

overloaded with patients, whereas the basic levels are underutilized. Hence it is an important and significant task for the stakeholders to consider the efficient side as well as the inefficient side of the health support function of the publicly provided institution.

India in 2010-2011 has spent 5.2 percent of its GDP (Rs 10300 crore) for the health expenditure. After 65 years of Independence, regarding health a number of non-rural based development programmes were taken and 25 percent of people lying below poverty line were fighting against survival with poor health. National public health policy has been based on implicit assumption that healthcare is a basic right to the people and access should not be denied on the ground of inability to pay or other socio economic reasons. The resources provided by the government for such vast majority of population to achieve better health status is insufficient. But the cost of healthcare as well as growth of healthcare seeking population increases day by day. Numerous attempts by researches across the world in recent time were made for solving such resource constraint in the public health sector for effective and efficient delivery of health output. Several studies show that people prefer private care rather than publicly provided health system during their ailments and face a large amount of out-of-pocket expenses for curative care (*Sundar* 1995, *Visaria et al* 1994). Private sector has strong capital background in medical technology, hospital construction, manufacture and sale of pharmaceuticals. As they are basically profit maximisers, price charged by them is merely possible for the poor rural people to pay. The healthcare delivery system in India has been characterised by 'four-tier network' of village Primary Health Centres and Sub-Centres (PHC and SCs), Block Level Primary Health Centres (BPHC), Sub-Divisional Hospitals / District Hospitals (SDH / DH) and State General Hospitals (SGH). Huge numbers of unqualified Rural Medical Practitioner (RMP) are sublime with healthcare practice without any professional qualification.

Following a growing literature on healthcare, the present study has a twofold investigation. One is on health seeking behaviour and other is efficiency of the existing producer with specified quality of care. World Health Organisation in 1948 stated that health is a composite function that includes biological, social, psychological, environmental and economic factors. Arrow (1963) first identified some features of health seeking behaviour in terms of demand for healthcare. The features are demand for medical care is unsteady, irregular and unpredictable in nature. Illness is not only risky but also costly as it leads to death. It is such a commodity where the product and the activity of production are identical. Before consuming such a good a patient cannot testify the quality of care. As a result, some trust elements exist within the patients and providers relation. But the physician has more information than the patients, so the product quality is uncertain and there is some asymmetry within the uncertainty. The supply of

medical care is artificially controlled by licensing to maintain the quality and extensive price discrimination is practiced in the profession. The private costs are very much lower than the social cost, so society achieves optimality by non-market means.

Even in most affluent countries, people who are less well off are focused with shorter life expectancy and more disease prone than the rich. Thus, health differences are disturbed social justice. In modern sense, health and social environment combined indicate social determinants of health, and the product is universal access of medical care. Thus, to analyse health seeking behaviour and then efforts to estimate the efficiency of the existing producers in district (Block) level is possibly encapsulates the social welfare aspects of developments. The domain of this study deals with the availability of health resources for efficient delivery of health output. So it confirms the consumption and distribution aspects of the problem domain. The approach of the study covers both the demand and supply sides because health seeking behaviour is a part of demand side and efficiency estimation is a part of supply side. The study encompasses following objectives

1. To comprehend the health seeking behaviour of the dwellers of Jalpaiguri and Cooch Behar districts and detect their health hurdles.

2. To discern the contribution of Primary Health Centres (PHCs) in health output in both the districts.

The study looks for to understand the disease profile including minor illness, hospitalization, situation of maternal and child health, non-communicable diseases and mental health of these districts. Except price and quality effects, what other factors also affect healthcare choices is another part of health seeking behaviour. The role of education, age, duration of illness, and so forth, provide important insights into the potential opportunities and limitations of public policy to affect patterns of demand. This will help us to understand the health seeking behaviour of the inhabitants and to identify the barriers to access healthcare services encompassing social, physical and economic aspects.

The role of Primary Health Centres (PHCs) in the entire system of healthcare delivery and utilization is another significant objective of this study. In this regard the understanding of their referral system and weakness which are the most important causes to improve the health status of the people, especially the poor, by reducing mortality, morbidity and disability. This will focus light on the causes of bypassing the local health facilities and congestion in the upper tier hospitals.

The need for a special focus on Jalpaiguri and Cooch Behar is longstanding due to its extreme geographical barriers and huge poverty among most of the blocks which faces inadequate and ineffective public health services. Our focus not only to show why these two districts are different in terms of health indicators and utilization of healthcare services but also to measure the extent of unmet need for

people's health security. Thus to estimate the efficiency of health system is another main interest of this kind of research. Health of this area is very much linked to their social, environmental and economic security, so it is our aim also to measure the links and posit health security on a broader spectrum of issues related to the protection of the Jalpaiguri and Cooch Behar districts.

The study is based on following primary research questions.

(a) What kind of similarities or dissimilarities exists in health indicators of these two districts compared to the whole of West Bengal?

(b) How is the health of this area linked with social, environmental and economic securities which posit health security on a broader spectrum of issues related to the protection of the Jalpaiguri and Cooch Behar?

(c) How much heath inequity performs between rural-urban areas, among various social groups, standard of livings as well as religious groups and caste groups between the districts?

(d) How even (or uneven) is the healthcare distribution of accessibility problem across all blocks of the two districts?

(e) What levels the obstructions (the districts faces) are strong to achieve a reliable source of health care?

(f) What kind of efficiency variations performs between different (primary) public health providers in Jalpaiguri and Cooch Behar?

Data and Methods:

The primary data sources are Sampled patients from the Primary Health centres (PHCs). The secondary panel data will be collected from Primary Health Centres (PHCs) of different blocks and an in-depth interview with Block Medical Officers in Health (BMOHs) and Chief Medical Officer in Health (CMOH) of Jalpaiguri and Cooch Behar districts. For comparison of the results with national and state level, the study also uses District Level Health Survey, National Family Health Survey (DLHS-III, NFHS-3) data set. The study discusses the health behaviour of peoples and providers in some particular point of time and the character of data may change in another point of time. So such kind of studies is not fully static and dynamic in sense, hence comparative static nature is more appropriate here. The study methodologies are different for customer and providers of health services. But there must be some linkage between these two methodologies which also helps us to explain the significance of the research.

Patient Survey

For the purpose of the study, detailed visits were made in all the 67 Primary Health Centres (PHCs) under structured questionnaire, of which 38 are located in Jalpaiguri district and 29 are located in Cooch Behar district. The infrastructural, manpower, medicines, inpatients admission and outpatients visits was observed

very carefully for each PHC under structured questionnaire. For some yearly results in case of patient's admissions and outpatients visits were collected from the district Chief Medical Officer in Health (CMOH) office at Jalpaiguri and at Cooch Behar. During the visits of PHCs another parallel survey has been conduct on the inpatients and outpatients visited at that time of that concerned PHCs. In case of outpatient department (OPD) every second patient in the specialty queue was approached and briefed about the study by the investigator. If he or she agreed, they were asked about their socio economic conditions at that time. As they finished their visits in the PHCs completing all types of services like doctor's advice, medicines allocation, diagnostic tests etc., they again approached at the gateway of PHCs regarding the experiences they gathered from such facilities. By this way a total of 1819 patients have been surveyed from OPD facilities of the existing 67 PHCs of which 937 are from 38 PHCs of Jalpaiguri district and 882 are from 29 PHCs of Cooch Behar district. In case of inpatient department (IPD) visits the study first consider that bed size of the all 67 PHCs of the two district varies from 0 to 10, and there are total 458 beds providing IPD services for the 6 million people at the primary level healthcare. Here the study meets with the two third patients of the IPD in each PHC. The selection of the patients has been made on the basis of every first and second patients from the three patients admitted in the respective PHCs. Thus out of 458 beds 356 patients have been interrogated regarding their perception of service quality rendered by the PHCs of the study area.

Based on theoretical framework, factors that determine the demand for PHC services in Cooch Behar and Jalpaiguri district are explored by using binary Probit regression model. This is the probabilistic distribution from where the probability of either seeking healthcare services during ailments episode or not from PHCs. An assumption will be made that the error term takes a standard normal distribution. Here, our dependent variable is latent. Since we are not able to observe the latent variable Y^*, we cannot estimates its variance also (Green, 2008). There exist a linear relationships between unobservable variable Y^* and explanatory variable (X_i) represented as

$$Y^* = X_i\beta + \mu \quad ....(1)$$

Where Y^* is the unobserved/latent variable (Probability of seeking healthcare from PHCs).
X_i is a pool of independent variable of both demographic and socio-economic factors.
From equation (1) above unobservable variable Y^* is linked to the observed binary variable Y as expressed
$Y = 1 \; if \; Y^* > k$

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$$0 \; if \; Y^* \leq k$$

Where Y is the probability of seeking care from PHCs, 1 if one uses, that is sought care from PHCs and 0 other wise. k is the threshold beyond which one is sought care from a private health facility. In Probit model with assumption of normal distribution with zero mean and unitary standard deviation, the study will estimate the marginal effects in order to interpret the results of the analysis.

During specification of our model we can write the equation as:

Demand for healthcare from PHCs $= \beta_0 + \beta_1 A + \beta_2 ED + \beta_3 D + \beta_4 I + \beta_5 W + \beta_6 R + \beta_7 RL + \beta_8 AI + \epsilon_i$

Where A= Age; ED=Education; D=Distance to the nearest PHCs; I= BPL card holdings; W=Wealth Index; R= Residence; RL= Religion; AI= Information about access.

The model have expected following signs for the variables. Demand for PHC services means the respondents who state the place healthcare services were sought. The code used by the study is 1 if it was from PHCs and 0 otherwise. Age of the individual measured in complete years. Education means number of years spent in school. Distance to the nearest PHC means 1 for near and 0 for far. BPL card holding is not a proper measurement of poverty. Because card holding depends upon factors like manipulation, political connection etc. Though in the study uses 1 for card holding and 0 for otherwise. Wealth index was constructed in terms of poor (1) and rich (2). Residence means place of current residence, and here 1 if residence is rural and 0 for urban. Religion is identified if one has religion as 1 and 0 for no religion. Information to access is identified if an individual posses radio/television or read newspaper for 1 and 0 otherwise.

Results and Discussions:

Thus study interrogates 2175 patients from 67 (38 PHCs of Jalpaiguri & 29 PHCs of Cooch Behar) Primary Health Centres (PHCs) in Jalpaiguri and Cooch Behar district. Here, the study covers both inpatient (356) and out-patient department (1819) under a structure. The socio-economic background of the patients are collected and analysed, the study also tries to evaluate about the quality of services and its nature also. The causes behind the reasons when they remain absent to achieve such services were also attempted. This possibly identifies the barriers which obstructed to get such health services.

The fund allotted for health units according to the number of beds allotted to that health units. In case of several PHCs are running without beds one average processes are followed for distribution of funds. The upper tier facilities like Block Primary Health Centre (BPHC) or Rural Hospital (RH) which are developed from PHCs with both Inpatient department (IPD) and Out-patient

department (OPD) communicated with some allotted PHCs under it. Now whether through district level or directly from state funds are allotted to the PHCs either in terms of bed (for which have IPD facilities) or on the basis of average i.e., how many PHCs are performing under one BPHC. Significantly the bed size also varied among PHCs who have IPD facilities. The bed size of the PHCs are varies from 2 to 10. Thus bed number wise survey can generate some kind of biasness. To solve this problem we consider some kind of floor to the sample size. Thus we consider a minimum of 15 patients per PHCs, in order to balance of maximum 30 patients. Thus, in this way we have 2175 patients altogether.

It is also an important task of this kind of survey is that how many patients among a sample size will be selected from IPD and how many from OPD. To determine the corresponding sample size for IPD and OPD, the study took some help from the state level provided secondary data. For West Bengal the study found 909 PHCs with 6612 bed strength and cater a bulk of patients. In Cooch Behar district, there are 29 PHCs with 202 beds and in Jalpaiguri district, there are 38 PHCs with 256 beds. We collect the data from district health office that how many patient visited each PHCs in IPD and OPD facilities in 2012 and calculate the ratio for each PHCs. We divide the sample size in terms of that ratio for each PHC and get the allotted sample size for each PHCs. Table-1 shows the allotted sample size for each PHCs according to its IPD and OPD facilities for both the districts. Thus the sample selection shows that in total 356 people are surveyed for IPD and 1819 people are surveyed for OPD facilities and in total 2175 patients are surveyed to get the information regarding their ailments pattern and also regarding their conception of services what they receive from different PHCs. Hence the study added that out of total OPD patients information 50.80% collected from district Cooch Behar and 49.20% are from Jalpaiguri district. Similarly the corresponding percentage for IPD in Jalpaiguri is 55.06% and from Cooch Behar is 44.94% respectively.

Table-1: Sample size allocation to each PHCs

Jalpaiguri					Cooch Behar				
Block	No of PHCs	No of Bed in PHCs	Sample size OPD	Sample size IPD	Block	No of PHCs	No of Bed in PHCs	Sample size OPD	Sample size IPD
Jalpaiguri	5	32	105	25	Cooch Behar-I	2	16	64	11
Maynaguri	6	52	132	44	Cooch Behar-II	4	24	119	20

Dhupguri	3	14	51	10	Tufanganj-I	3	24	84	21
Rajganj	3	22	94	15	Tufanganj-II	2	14	66	11
Mal	3	16	55	11	Dinhata-I	1	6	28	3
Meteli	2	16	61	11	Dinhata-II	4	22	124	18
Nagrakata	2	14	49	10	Setai	2	8	79	5
Falakata	2	10	42	8	Mathabanga-I	2	20	66	18
Madarihat	3	26	91	19	Mathabanga-II	3	26	93	21
Kalchini	2	4	26	2	Sitalkuchi	2	10	68	7
Alipurduar-I	2	14	53	13	Mekhliganj	2	10	59	7
Alipurduar-II	3	24	88	18	Haldibari	2	22	74	18
Kumargram	2	12	48	10	**Total**	29	202	924	160
Total	**38**	**256**	**895**	**196**					

Source: Sample size calculation on the basis of patient visits in 2014 at different PHCs

A significant determinant of this kind of study is to adopt a methodology which one is more appropriate to make choice of a patient during the survey. To cover the morbidity pattern, disease profile the choice pattern must have some randomness. So in case of OPD patients we have to marked same weight to some basic type of illness. The study categorised illness for OPD patients in three basic types. The first category cover general illness, which includes fever, diarrhoea etc., the second category covers maternity and gynecological problems and needs, and the third category includes eye problems, ear-nose-throat problems (ENT), orthopedic problems, pediatric problems, skin problems, surgery etc. A particular patient or patient party is chosen by the following manner. In OPD every patient are asked about their nature of ailments first. Then according to the nature of ailments and on the basis of sample size they are asked about the socio-economic conditions if they agreed. If he refuses we go to the next patients. In case of IPD same weightage is given to male and female wards. In IPD a specific patients with sex were visited two out of three randomly selected and interviewed for his/her personal experience so far with PHC.

Socio-economic Quality of Patients:
To judge the economic status the study consider whether the family situated above or below the below poverty level (BPL). In such identification the study consider the criterion as whether the family have BPL card or not, assuming that the card distribution process is mostly perfect. The study found 78% visited PHCs

have BPL card. But BPL card holding is not actually representing the proper economic status. This is due to the fact that holding BPL card depends upon political connection, power of ability to manipulate etc.

As a result another factor like monthly per capita expenditure (MPCE) for each family can be considered as indicator of measuring the economic status of the patients of that family. According to planning commission (2011) the estimate for rural poverty is Rs 390 for an individual in rural areas. Thus according to MPCE we divide the patients in two categories, MPCE1, and MPCE2. Under MPCE1, the patients whose $MPCE \geq Rs\ 390$ and the patients under category MPCE2, whose $MPCE < Rs\ 390$. Since more than 80% of the PHCs are located in rural or semi-urban area, so we consider the rural poverty bench mark as an proxy to estimate the economic status of the patients.

Figure-2 describe the relation between MPCE status and BPL status of the sampled patients in PHCs both for IPD and OPD care. The study found that among MPCE2 category for OPD patients 68.03% hold the BPL card, which indirectly signify that near about 32% from MPCE2 category do not posses BPL card though they are also belonging in lower income status. Since they do not have BPL card, they are ruled out to get free service access from PHCs. Similar things also happen for IPD patients belonging to MPCE2 group.

Figure-1: MPCE2 Patients for IPD & OPD Section (Jalpaiguri & Cooch Behar)
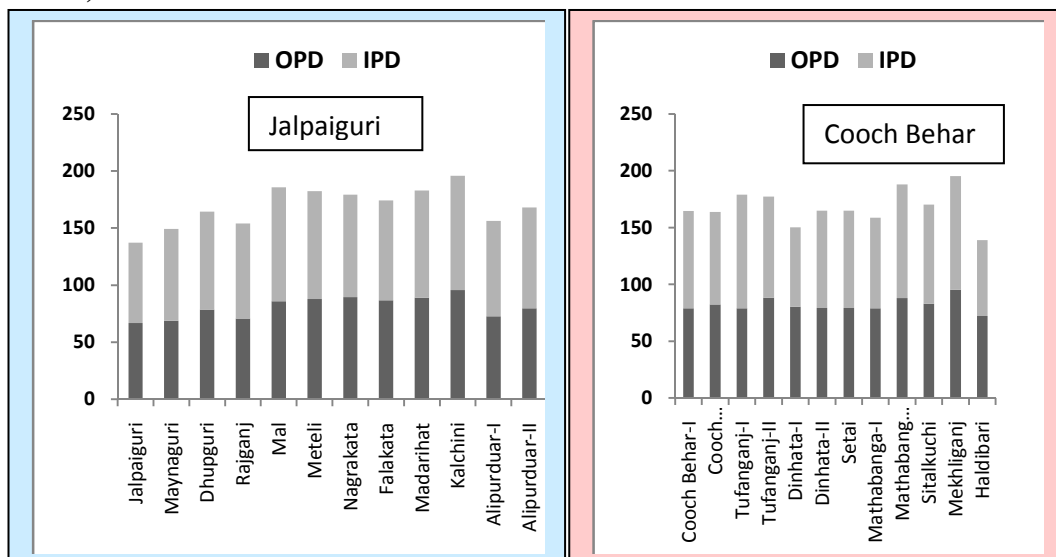
Source: Sampled patients of PHCs, 2014

Figure-2: % Distribution of MPCE with BPL Status among Sampled Patients
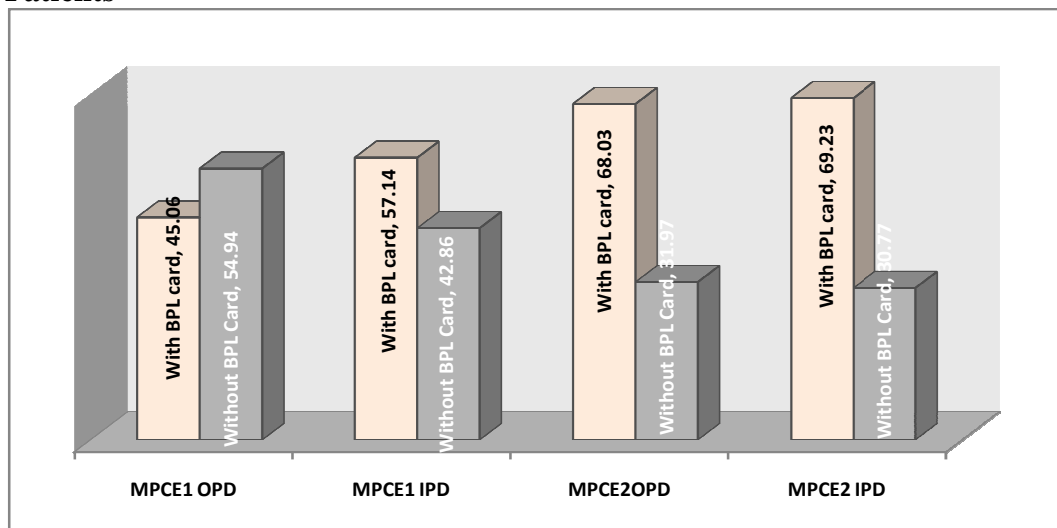
Source: Sampled patients of PHCs, 2013

Under socio-economic status of the OPD & IPD patients, the study deals with four main parameters. These are types of houses, drinking water facility, type of drainage system, and type of sanitation. Here, we use the Principal Component Analysis (PCA) to transform the information to one component which will represent the overall background of the patients. PCA is a non-dependent mathematical tool which uses an orthogonal transformation to convert a set of observations of possibly correlated variables into a set of values of uncorrelated variables called principal components. In this transformation process the first principal component has as high a variance as possible and the next succeeding component in turn has the highest variance as possible under the constraint that it would be orthogonal (uncorrelated) with the preceding components. By this way here the four dimension background characteristics are converted to single valued index with one dimension scalar.

Table-2 identifies this index for OPD and IPD patients. After calculating the index for each patient, we create two groups. One is above average mean index and the other is below the mean average. The first group is termed as 'good background index' (GBI) which are staying above average and the second group is termed as 'bad background index' (BBI). In our study majority of the patients are belonging to the BBI group. The possible explanation behind such behaviour is that those who have GBI are representing the affluent people, and they visited

the private healthcare facilities during their ailing periods. From table-2 it is clear to us that both the index for IPD and OPD patients majority belongs to BBI. Here, for OPD patients on an average 15% are belonging to good background category and the remaining 85% are belongs to the bad background category. Similarly for IPD patients the study found only 9% on an average are in good background category and the remaining 91% are in the other. The data describe that for bad background patients limited options remain other than IPD care from PHCs for the majority of the people.

Table-2: Socio-economic status index of sampled IPD & OPD patients

Jalpaiguri					Cooch Behar				
Block	**% of OPD Patients**		**% of IPD Patients**		**Block**	**% of OPD Patients**		**% of IPD Patients**	
	GBI	**BBI**	**GBI**	**BBI**		**GBI**	**BBI**	**GBI**	**BBI**
Jalpaiguri	27.45	72.55	11.27	88.73	Cooch Behar-I	13.38	86.62	9.52	90.48
Maynaguri	29.31	70.69	14.21	85.79	Cooch Behar-II	14.29	85.71	13.16	86.84
Dhupguri	13.79	86.21	9.65	90.35	Tufanganj-I	15.79	84.21	0.00	100.00
Rajganj	21.25	78.75	10.34	89.66	Tufanganj-II	7.79	92.21	11.11	88.89
Mal	6.79	93.21	0.00	100.00	Dinhata-I	12.79	87.21	0.00	100.00
Meteli	8.25	91.75	2.45	97.55	Dinhata-II	20.98	79.02	21.43	78.57
Nagrakata	0.00	100.00	0.00	100.00	Setai	13.79	86.21	20.00	80.00
Falakata	12.33	87.67	8.75	91.25	Mathabanga-I	21.21	78.79	10.00	90.00
Madarihat	12.79	87.21	6.45	93.55	Mathabanga-II	12.12	87.88	0.00	100.00
Kalchini	4.25	95.75	0.00	100.00	Sitalkuchi	25.71	74.29	12.50	87.50
Alipurduar-I	19.75	80.25	12.25	87.75	Mekhliganj	18.60	81.40	0.00	100.00
Alipurduar-II	13.45	86.55	8.45	91.55	Haldibari	19.44	80.56	28.57	71.43
Kumargram	11.28	88.72	6.65	93.35					
Average	**13.90**	**86.10**	**6.96**	**93.04**	**Average**	**16.32**	**83.68**	**10.52**	**89.48**

Source: Sampled patients of PHCs, 2014

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Figure-3: Educational Status of OPD & IPD Patients of Two districts (Combined)
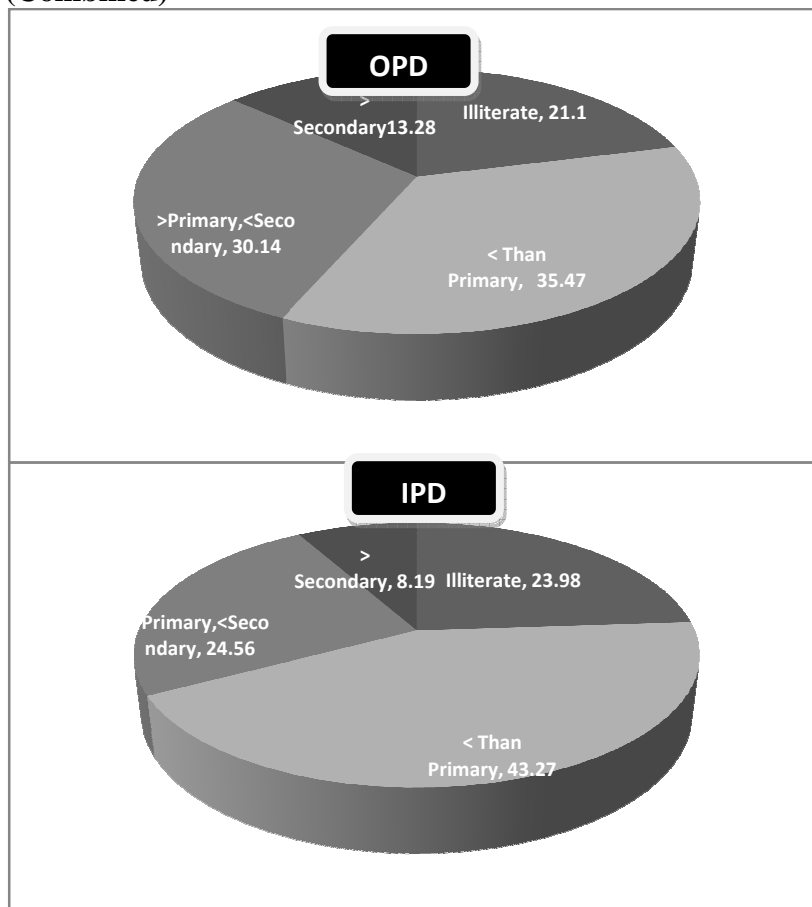
It is important to collect the educational background data of the patients or the person helping the patient because to get the information that whether they come to those PHCs for treatment guided by their educational background or not. To search such investigation the study collect the educational background data for both in-patient and out-patient department of Jalpaiguri and Cooch Behar districts. Figure-3 describe the educational status of both OPD and IPD patients in terms of four categories. These are illiterate, less than primary education, above primary but less than secondary, and above secondary education. The study found that on an average from patients of different block 35% of OPD patients have some sort of education which is less than primary education base, and 30% of them are have education level between primary and secondary level. In case of IPD patients the study found one fourth (24.56%) of them have some better kind of education status, which establish the fact that patients with some education

only come for treatment here. At least one fifth of OPD and IPD patients show that they have no education background.

The relationship between demand for healthcare from PHCs and the independent variables can be shown by correlation matrix. High correlations contribute to multicollinearity which indicates the wrong estimates. Here, distance of to nearest PHC was found negatively correlated with demand for PHC services, while other variables are found strong positively correlated. To confirm the existence of multicollinearity, the study computed VIF (Variance of Inflation factors) with a recommended threshold of 10 with a tolerance value of not less than 0.1.

Table-3: Correlation Matrix

Variables	Demand for PHC services	Age	Education	Distance	Health Insurance Coverage	Wealth Index	Place of residence	Religion	Information Access
Demand for PHC services	1.000								
Age	-0.0117	1.000							
Education	-0.1954*	-0.1097*	1.000						
Distance	-0.1024*	-0.2122*	-0.0071	1.000					
BPL card holding	0.1558*	0.1424*	0.3247*	-0.1148*	1.000				
Wealth Index	0.2447*	0.0583*	0.6216*	-0.0928*	0.3512*	1.000			
Place of residen	0.1431*	0-0.0056	0.2426*	-0.0704*	0.1378*	0.4803*	1.000		

ce									
Religio n	0.08 76*	- 0.01 01*	0.104 4*	- 0.000 1	0.057 6*	0.12 21*	0.069 1*	1.000	
Inform ation	0.18 49*	- 0.03 24*	0.394 5*	- 0.054 7*	0.162 2*	0.46 81*	0.164 2*	0.115 8*	1.000

Significant at 5% level.

Table-4: VIF

Variable	VIF	VIF^2
Age	13.45	3.67
Education	5.19	5.19
Distance	1.67	1.51
BPL card holding	1.39	1.39
Wealth Index	8.97	8.84
Place of residence	2.06	2.04
Religion	15.64	8.05
Information	5.97	5.92
Mean VIF	6.79	4.56

The VIF test shows that religion and age had values above the threshold, which means multicollinearity. To address this problem the study uses squared age (VIF^2) to make it non-linear. The study found all the values of VIF^2 were less than the recommended threshold of 10, then we can concluded that multicollinearity was thus absent.

In table-5 the results of probit regression are shown. In both the districts the coefficient of age is statistically significant at 5% level. The study revealed that an additional year reduces the probability of uses of PHC as a source of care by 0.00021% in Jalpaiguri and 0.00019% in Cooch Behar. This means that as one gets older, the likelihood of using PHC care are reducing in both districts. This may be associated with the reducing quality care and a tendency to bypass PHC may arise from such factors. Thus the study indicates that quality of care has a significant impact on demand for PHC care.

The study reveals that at 1% level of significance, an extra level of education led to a statistically significant result. The increase in education level reduces the demand for PHC care by 5.91% in Jalpaiguri and 5.72% at Cooch Behar. This

means that academic advancement is negatively associated with quality care provided by the PHCs.

Table-5: Probit indexes and Marginal effects for Jalpaiguri & Cooch Behar

Probit Regressions No of Observation: 1091(Jalpaiguri), 1084 (Cooch Behar)						Marginal Effects					
Demand for PHC services	Coefficients		t-statistics		P-value		Coefficients		t-statistics		P-value	
	JAL	COB	JAL	COB	JAL	COB	JAL	COB	JAL	COB	JAL	COB
Age	-0.00000188 (0.00000028)	-0.00000142 (0.00000026)	2.31	2.47	0.013	0.0132	-0.00000212*** (9.58e^{-06})	-0.0000192** (9.12e^{-06})	2.31	2.47	0.013	0.0132
Education	-0.0162189 (0.0024134)	-0.0159738 (0.0023866)	6.64	6.33	0.0000	0.0000	-0.059138*** (0.0087175)	-0.057214*** (0.0089075)	6.71	6.48	0.0000	0.0000
Distance	-0.1721305 (0.0408324)	-0.1753207 (0.0357751)	-4.15	-4.77	0.0000	0.0000	-0.0654149*** (0.0136887)	-0.071328*** (0.0184457)	-4.16	-4.77	0.0000	0.0000
BPL card holding	0.2866542 (0.048265)	0.2475441 (0.056155)	5.59	6.01	0.0000	0.0000	0.1011553*** (0.0181141)	0.1255114*** (0.0194478)	5.64	6.21	0.0000	0.0000

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Wealth Index (Reference category Poorest wealth quintile)												
Poorer	0.2041774 (0.0542378)	0.2721114 (0.0611024)	3.91	3.84	0.000	0.000	0.0783614*** (0.0214325)	0.0841445*** (0.0292557)	3.84	3.69	0.000	0.000
Rich	0.0758144 (0.041647)	0.0818911 (0.047119)	1.97	1.85	0.071	0.064	0.0322141* (0.0173541)	0.0349247* (0.0185441)	1.97	1.85	0.073	0.065
Place of residence	0.0897432 (0.0471227)	0.0954335 (0.0383355)	2.78	2.54	0.007	0.006	0.0374545*** (0.0135472)	0.0319461*** (0.0241323)	2.81	2.67	0.007	0.006
Religion	0.2103947 (0.0944236)	0.2004995 (0.0910584)	2.31	2.12	0.041	0.038	0.07827** (0.0365877)	0.0845541** (0.0353954)	2.31	2.12	0.041	0.038
Information	0.0743648 (0.0419628)	0.0750641 (0.0391983)	1.94	1.81	0.070	0.073	0.0279124* (0.0145714)	0.0311228* (0.0193578)	1.94	1.81	0.070	0.073
Constant	-0.5712826 (0.098521)	-0.5127326 (0.093241)	-5.67	-5.24	0.000	0.000	-	-	-	-	-	-

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level*

The coefficient of distance factor to the closer PHC was also found significantly lower the probability of demanding PHC at 1% level by 6.54% in Jalpaiguri and 7.13% in Cooch Behar. This means that more one is far from private health facility the less he/she is likely to demand for PHC care. The findings are same with the study results of Mushtaq et al., (2011) who sought to establish the socio-demographic correlates of the health seeking behaviours in two districts of Pakistan. Thus the transport difficulties due to distance is a major cause low utilisation of PHCs in both districts.

The coefficient of BPL card holding was shown significantly increase the PHC care demand. At 1% level of significance it increases the demand for PHC care by 10.11% in Jalpaiguri and 12.55% in Cooch Behar. Generally, a change from lower wealth level to higher wealth level leads to significant probability increase in demand for private care rather than public care. The coefficient for poorer wealth quintile significantly increased the probability of demand for PHC care at 1% level by 7.83% in Jalpaiguri and 8.41% in Cooch Behar. In case the coefficient for rich wealth quintile, the probability of demand for PHC increases at 10% level of significance by 3.22% in Jalpaiguri and 3.49% in Cooch Behar. The coefficient of place of residence was found to be significant. Residing in rural areas was shown that significant increase in probability of utilising the PHC care by 7.82% in Jalpaiguri and 8.45% in Cooch Behar. This again confirms that rural people much more dependent on lower tier health support units whereas the urban counterparts are much more on upper-tier and private care facilities.

To determine the study uses an index known as Doctors Involvement Index (DII) (Dutta A. et al., 2011). This can be calculated as:

$$\text{DII} = \frac{Actual\ OPD\ hours\ Per-week\ day}{Normal\ OPD\ hours\ Per-week\ day}$$

Since data on numbers of doctors in position in PHCs are already collected, from that we calculate the total number of OPD doctors' hours for each PHCs according to actual norms (a total 28 hours OPD hours per week, i.e. 5 hour norms from Monday to Friday and 3 hour for Saturday). This index takes care of how many patients can be served with time and quality if the doctors have given full norm hour in the hospital OPD, whereas they have devoted only a small fraction of their full norm hour in the hospital OPD.

The Perception Index (PI) generated from the perception of quality from the inpatients only because they have only a perception about the services of the PHC in case of cleanliness, manpower efficiency, behaviour, diet etc. The PI is calculated on the same pattern like DII. Here, we consider the factors like cleanliness, manpower efficiency, behaviour, and diet offered in PHC in terms of four point scale like A, B, C, and D, where A means 'excellent', B means 'fair', C means 'moderate' , and D means 'not satisfactory'. The weight on the basis of such grading can be marked as $A = 1.0$, $B = 0.5$, $C = 0.25$, and $D = 0$. During inpatient survey another question is also asked: whether they come back to that PHC in future if they will have some ailments. This is also an influencing factor of PI. If the answer is yes, it takes value '1' and if the answer is no, the value obtains '0'. Whatever may be the fact the PI can be calculated for each PHC and aggregated for each block. The PI can be calculated from the following formula:

$$PI = \frac{[Actual\ Perception\ value]}{1} + \frac{[Value\ fixed\ for\ future\ come\ back]}{1}$$

Here, the highest value of PI for any PHC can be '2', and that can be judged as the best functioning PHC according to inpatient perception, and the minimum value of PI can be '0', which can be identified as worst performing PHC in the view of inpatient services.

Table-6: Doctors involvement index in PHCs of different blocks

Jalpaiguri					Cooch Behar				
Block	No of PHC	Manpower at PHC	DII	PI	Block	No of PHC	Manpower at PHC	DII	PI
Jalpaiguri	5	17	0.750	1.330	Cooch Behar-I	2	13	0.681	1.244
Maynaguri	6	21	0.670	1.830	Cooch Behar-II	4	20	0.734	1.130
Dhupguri	3	7	0.720	0.250	Tufanganj-I	3	11	0.427	0.840
Rajganj	3	10	0.610	0.920	Tufanganj-II	2	6	0.440	0.633
Mal	3	9	0.597	0.660	Dinhata-I	1	12	0.638	1.122
Meteli	2	6	0.590	0.830	Dinhata-II	4	8	0.499	0.782
Nagrakata	2	6	0.460	0.490	Setai	2	6	0.522	0.120
Falakata	2	4	0.410	0.170	Mathabanga-I	2	13	0.597	1.645
Madarihat	3	8	0.450	0.750	Mathabanga-II	3	9	0.622	0.881
Kalchini	2	5	0.495	0.155	Sitalkuchi	2	6	0.430	0.176
Alipurduar-I	2	7	0.895	1.215	Mekhliganj	2	6	0.417	0.274
Alipurduar-II	3	11	0.796	1.320	Haldibari	2	9	0.577	0.834
Kumargram	2	6	0.670	0.750	**Average**			**0.5487**	**0.8400**
Average			**0.62**	**0.8**					

	41	21			
Max Value	0.89 5	1.8 30	**Max Value**	0.73 4	1.64 5
Min Value	0.41 0	0.1 55	**Min Value**	0.41 7	0.12 0
Correlation coefficient between DII & PI	0.5826		**Correlation coefficient between DII & PI**	0.8176	

Source: Patient survey during PHC visits, 2014

Table-6 shows the average value of DII in each block which is calculated on the basis of collected data from the PHC administration visits and PHC patient visits. Here, during this survey on PHCs, each and every PHCs were visited three days of a week to collect the information related to IPD and OPD patients and to understand the uses of equipments and manpower. On each day the presence of the doctor for that day was observed and by this way considering for three days, the study prepare the DII value for that PHC by averaging the doctor attendance of those days. The calculated value of DII shows that for the district the average doctors involvement is near about 62% in Jalpaiguri district and 55% in Cooch Behar district. This means that doctors are contributing about two third and slightly above half of their involvement what is actually due from their end in Jalpaiguri and Cooch Behar districts respectively. If we combined the data set of two districts the average value of DII is 58.79% and PI is 81.40%. That means 41% DII remains unutilised and which can increase the health status by determining the treatment process of ailments episode. The disaggregated data (Figure-4) from the districts show that in some blocks like Falakata, Madarihat, Nagrakata and Kalchini of Jalpaiguri district and Tufanganj-II, Setai, Sitalkuchi, Mekhliganj of Cooch Behar district the value of DII is low though there is high demand for health staff. This is important to note that when the poor villagers have not found proper healthcare in the PHCs then they have two options, either they visit the upper tier facilities or they remain absent from taking any type of care.

Figure-4 : The DII & PI value for the blocks PHCs in Study Area
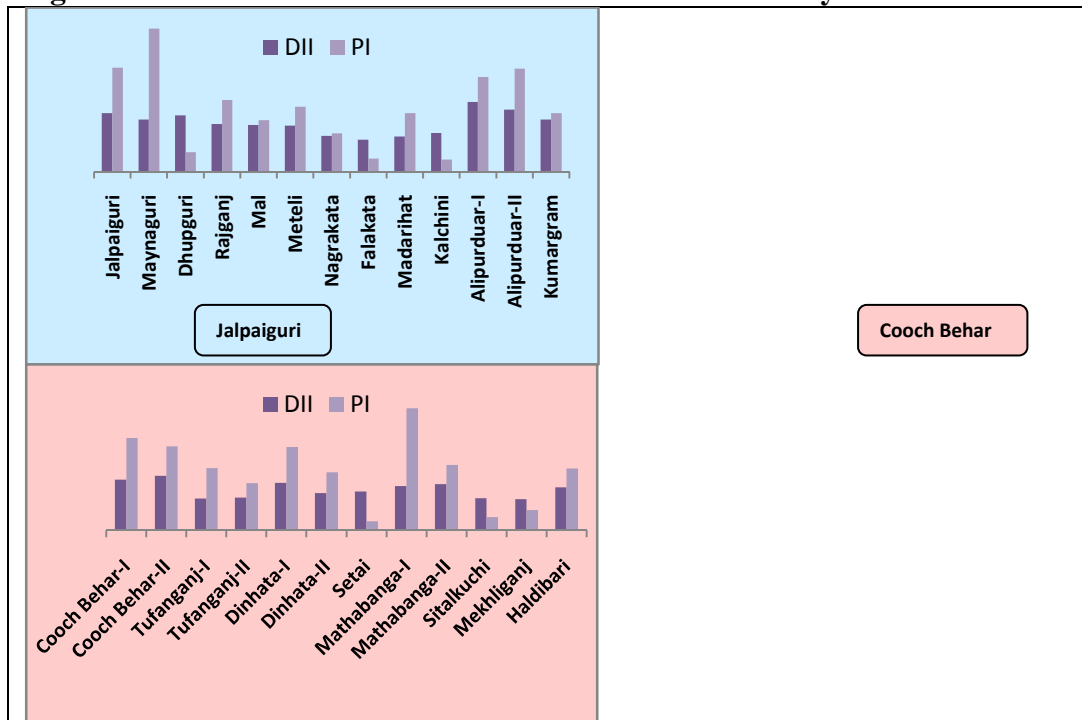
The significant factor from table- shows that the value of PI can be higher for those block where the bed number is more frequent than the PHCs where it is low, and also for blocks like Nagrakata and Kalchini the values of PI are the lowest like DII. It is very much rational for the patients that if they are well informed regarding availability of doctors or nurses in particular PHCs, then it becomes easier for them to decide to go or bypass that health unit during their ailing periods. This may be the reason behind the positive correlation between DII and PI. The value of correlation coefficient between DII and PI is 0.5826 in Jalpaiguri and 0.8176 in Cooch Behar. This means that doctors involvement index is quite highly correlated with the patient perception index which is also quite expected in such health staff arid region.

Conclusion:

The healthcare system of two districts is extensively described by public sector constituents, substantiated by private hospitals, independent medical practitioners and rural unqualified medical practitioners. The upper-tier public facilities are over loaded and some bypass tendency are observed for the lower tier facilities. In the Probit regression to observe the demand for PHC healthcare support system the study consider some independent variables The interesting feature of those

variables more or less explain the purpose of the study. To increase the utilisation of the PHCs the government need to implement some plan which attract the people during their ailments episode. The involvement of medical practitioners is one of the significant factor. The cross sectional data with several socio-demographic factors considered in the study but the factors like marital status, empowerment, gender of the household head were not considered. So there may be scope to extend the study for such inclusions and also extensions for state level study.

References:

Ahmed MS, Adam AM, Chowdhury M, Bhuiya A. (2003), Changing health seeking behaviour in Matlab, Bangladesh: do development intervention matter? Health Policy and Planning, Vol. 18(3), pp. 306-315.

Arrow KJ. (1963) Uncertainty and the welfare economics for medical care, American Economic Review. Vol. 53(5), pp 921-969.

Agha S. 2000, The determinants of infant mortality in Pakistan, Social Science and Medicine Vol 51 pp 199–208.

Alderman H. & Gertler (1989), The substitutability of public and private healthcare for the treatment of children in Pakistan, Living Standard Measurement Survey, Working paper No. 57, World Bank, Washington D.C.

Alderman H & Levy V. (1996), Household responses to public health services: Cost and quality tradeoffs, World Bank Research Observer, Vol. 11, No. 1, pp 3-22.

Baru R, Acharya A, Acharya S, Shiv Kumar, Nagraj K. (2010), Inequalities in access to health services in India: Caste, Class and region, Economic Political Weekly, Vol. XLV, No. 38.

Bhattacharya K (2007): Book, "Silent Departure", Papyras Publication, Kolkata.

Bhushan, Indu, Keller S and Schwartz B (2002), Achieving the Twin Objectives of Efficiency and Equity: Contracting Health Services in Cambodia, Asian Development Bank: ERD Policy Brief Series Number 6.

Bloom G, Kanjilal B and Peters DH (2008), Regulating Health Care Markets in China And India, Health Affairs, Vol. 27, No. 4 (2008), pp 952-963.

Canaviri J. (2007), A Random parameter Logit model for modeling healthcare provider choice in Bolivia, MPRA Paper No. 3263.

Carr-Hill RA, Sheldon TA, Smith P, Martin S, Peacock S, Hardman G (1994), Allocating resources to health authorities: development of method for small area analysis of use of inpatient services, British Medical Journal Vol 309, pp 1046-1049.

Census Report, (2001), Census Report of India, 2001, Source: www.censusindia.gov.in

Dutta A. (2011), Hospital efficiency in West Bengal: A study on secondary level hospital, Project work Report, Govt. of West Bengal.

Ensor T. & Cooper S. (2004), Overcoming barriers to health services access: Influencing the demand side, Health policy & Planning, OUP, pp-69-79.

Farrell M J. (1957), The measurement of productive efficiency, Journal of the Royal Statistical Society Series, Vol. 120, pp 253-281.

Grossman M. (1972), On the concept of health capital and demand for health, Journal of Political Economy Vol 80(2), pp 223-255.

Grossman M. (2000), The human capital model of Health, Culyer AJ, Newhouse JP Edited Book, Handbook of health economics, Vol 1A. Published by Elsevier.

Gupta I. & Dasgupta P. (2002), Demand for curative healthcare in rural India: Choosing between private, public and no-care, NCAER Working Paper No. 82, National Council of Applied Economic Research, New Delhi.

Lavy V. & Germin J. M. (1994), Quality and cost in healthcare choice in developing countries, Living Standards Measurement Study Working Paper No. 105, World Bank, Washington D.C.

McFadden, DL. (1981), Econometric Models of Probabilistic Choice, in Charles F. Manski and D.L. McFadden (eds), Structural Analysis of Discrete Data with Econometric Applications, MIT Press, Cambridge, Mass.

Peter S. Heller (1982), A model of demand for medical and health services in Peninsular Malaysia, Social Science Medicine, Vol. 16 pp 267-284.

Ray SK, Basu SS and Basu AK (2011), An assessment of rural healthcare delivery system in some areas of West Bengal- An overview, Indian Journal of Public Health, Vol. 55, Issue 2, pp 70-80.

Sengupta A. & Mondal SK. (2009), Efficiency and financing in catering primary healthcare to the poor's: A study of rural health services in India, Journal of Health Management. Vol. 11 No. 3 pp 501-526. Sage Pub.

World Bank (1997), India, New directions in Health sector development at the state level: An operational prospective Report, Report No. 15753-IN.

World Health Organisation (2000), World Health Report, 2000- Health System: Improving Performance, www.who.int