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Health Status of Eastern Blocks of Burdwan District, West Bengal

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ABSTRACT

Attention should be paid in health care delivery system in the process of development of society. The study tries to explore the status of health care facility of eastern blocks of Burdwan district, West Bengal. Here, five basic indicators have been taken namely: Health Care Institution Population Ratio (HCIPR), Doctor Bed Ratio (DBR), Bed Population Ratio (BPR), Doctor Health Care Institution Ratio (DHCIR) and Bed Health Care Institution Ratio (BHCIR). We compute Health Care Facility Index (HCFI) to investigate the health care delivery system of the district. The study confirms that the situation of health care facility (HCF) of eastern blocks of Burdwan district is not in a good position except Burdwan-I block.

1.1 INTRODUCTION

Health is the fundamental aspect of human to enjoy a good quality of life. Good health gives freedom to people from illness and the ability to realize his/her potentiality. Health therefore, is the one's sense of well-being. There is an important linkage between health and health care. Health care should not be considered only as medical care. It also provides pro-preventive care (planningcommission.nic.in). Health care facility plays an important role and it should be available to everyone instead of a particular section of people (Mandal, 2012, p.299). A quality of life can be lived with the availability of basic services such as food, shelter, education, and health. 'Health is the level of functional or metabolic efficiency of a living organism. In humans it is the ability of individuals or communities to adapt and self-manage when facing physical, mental or social challenges' (Wikipedia.org). Health has been defined in wider sense by the World Health Organization (W.H.O.) in its 1948 constitution as 'a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity' (W.H.O., Geneva, 1964).

In a society when someone found to be ill-health is the liability to the community where he/she lives in and with that burden the society cannot bring prospers as the ill-health and poverty are the two sides of a coin (Mandal, 2010, p.503). Thus health related services and facilities become more vital to everyone. Health facility, in common is regarded as 'any location where health care is provided. Health facilities range from small clinics and doctor's offices to urgent care centers and large hospitals with elaborate emergency rooms and trauma centers. The number and quality of health facilities in a country or region is one common measure of that area's prosperity and quality of life' (Wikipedia.org). The most effective path to promote health

care for a vast majority of people is to develop effective primary health care delivery system. Health care service may be defined as 'all those personnel and community health services including medical care and related education and research oriented towards protection and promotion of the health of the community' (W.H.O., 1991). The Government of India has implemented several programmes regarding health care such as medical care, maternal and child health care, immunization, family planning and millions of people are being benefitted of it.

In one study done in Bankura district of West Bengal, it was found that majority of blocks having the facility of beds not more than one to four and almost all the blocks did not have any doctor for per ten thousand people which is really shocking and alarming. In case of availability of primary health centre (PHC), in an average more than forty thousand people were being served by per PHC. The overall condition of the district is not satisfying (Mandal, 2010, pp. 503-510). In another study carried out in Hooghly district of West Bengal, it was observed that on an average more than fifty thousand people were being served by per PHC. The highest number of beds was observed in Tarakeswar block for per ten thousand people. All most not a single doctor was available for per ten thousand people. In brief, health is in neglected condition in Government sector (Mandal, 2012, pp. 299-309).

There is no such relevant works done on Burdwan district regarding health care delivery system. The status and relative position of the blocks have been tried to explore here. Therefore; the present study tries to indentify firstly, to investigate the spatial distribution of Health Care Facility (HCF) across the blocks. Secondly, from the distribution of individual facility of HCF across the blocks, it is difficult to identify the relative position of the blocks in terms of HCF status. Keeping in mind, we try to develop a composite index of HCF status of each block. Thirdly, the study assesses the nature of similarity of blocks in terms of the HCF facility.

1.2 MATERIALS AND METHODS

The paper is based on the secondary data collected from District Statistical Handbook Burdwan, 2012. The district map of Burdwan has been collected from 18th All India Livestock Census, Agriculture Implements & Machinery, Fishery Statistics, West Bengal, 2007. All Hospitals, Rural Hospitals, Block Primary Health Centres, Primary Health Centres, other Departments of Government of West Bengal including State Government undertaking, Government of India including central Government undertaking & N.G.O./Private Bodies are considered in this study and together termed as Health Care Institution (HCI) and all the urban population has been added to their respective administrative block's population. In this study, we have taken up nineteen blocks of eastern part of Burdwan district.

We have tried to analyze the secondary database to explore the health care delivery system of eastern blocks of Burdwan district. Firstly, Health Care Institution Population Ratio (HCIPR), Bed Population Ratio (BPR), Doctor Population Ratio (DPR), Doctor Health Care Institution Ratio (DHCIR) and Bed Health Care Institution Ratio (BHCIR) indicators have been calculated by using following formulae.

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$$HCIPR = \frac{HCI \times 1,00,000}{Population} \quad (1)$$

$$DPR = \frac{Doctor \times 1,00,000}{Population} \quad (2)$$

$$BPR = \frac{Bed \times 10,000}{Population} \quad (3)$$

$$DHCIR = \frac{Doctor}{HCI} \quad (4)$$

$$BHCIR = \frac{Bed}{HCI} \quad (5)$$

Secondly, the indicator index for each block of the eastern blocks of Burdwan district is constructed from HCIPR, DPR, BPR, DHCIR and BHCIR to compute the Health Care Facility Index (HCFI). The calculated indicators are mentioned in the table-1.

Table-1: Indicators of Health Care Facility and their goalposts

Indicators	**Goalposts of the indicators**	
	Maximum value	Minimum value
Health Care Institution/'00000 population (HCIPR)	9.807 (Burdwan-I)	1.685 (Monteswar)
Doctor/'00000 Population (DPR)	75.065 (Burdwan-I)	2.615 (Burdwan-II)
Bed/'0000 population (BPR)	35.703 (Burdwan-I)	1.270 (Ketugram-I)
Doctor/Health Care Institution (DHCIR)	7.654 (Burdwan-I)	0.529 (Kalna-I)
Bed/ Health Care Institution (BHCIR)	36.404 (Burdwan-I)	5.750 (Burdwan-II)

Source: Authors' computation

The following formula is used to calculate the indicator index of each parameter.

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$$I_i = \frac{A_i - m_i}{M_{i-m_i}} \qquad (6)$$

Whereas; I_i= Indicator index of i^{th} indicator, A_i= Actual value of i^{th} indicator, M_i= Maximum value of i^{th} indicator and m_i= Minimum value of i^{th} indicator.

On the basis of the indices of indicators, the actual position of the j_{th}block in the five dimensional Cartesian space may be plotted by the vector ($I_{1j}, I_{2j}, I_{3j}, I_{4j}, I_{5j}$). The best situation, which is perfect health care facility, can be found in Cartesian space vector in terms of (1, 1, 1, 1, 1). The worst health care facility is denoted by the vector (0, 0, 0, 0, 0). At the end the Health Care Facility Index has been computed measuring the normalized inverse Euclidian distance of the vector ($I_{1j}, I_{2j}, I_{3j}, I_{4j}, I_{5j}$) from the worst condition (0, 0, 0, 0, 0). Therefore, the following formula can be put here as the each indicator/parameter has been given same weightage.

$$HCFI = 1 - \sqrt{\frac{\sum_{i=1}^{5}(1-I_i)^2}{5}} \qquad (7)$$

The normalization of Euclidian distance is done in order to ensure the range of HCFI from '0' to '1'. As the inverse distance has been taken, higher value of HCFI represents higher HCF. Thus the value '0' indicates no HCF and '1' indicates highest HCF. This distance-based approach has an advantage over the UNDP methodology of measuring achievement or deprivation Index. In UNDP methodology, the index presents the arithmetic or geometric average of the standardised indicators. It assumes perfect substitutability across the dimensions or indicators. Under this assumption a decrease in value of one indicator can be compensated by an increase of equal magnitude in another indicator.

Thus, if all dimensions or indicators are equally important for the all over index value the perfect substitutability among the indicators is an unrealistic assumption. In the distance based approach we do not need this unrealistic assumption. Our HCFI formula satisfies the properties of normalisation, symmetry, monotonicity, proximity, uniformity and signalling. But methodology of HDI follows only the properties viz. normalisation, symmetry, monotonicity. Thus, our distance based measure of HCF is superior to the measures based on UNDP methodology. This methodology is also applied by Bagli and Adhikary, 2015 & Ghosh and Mandal, 2015. The HCFI varies from '0' to '1' where; the value '0' and '1' refers to perfect health care facility and worst health care facility respectively. To have the better understanding of HCFI of each block, the value of HCFI has been divided into four sub-ranges.The very good condition of HCFI is represented by $0.8 < HCFI \leq 1.0$ and good condition of health care facility is indicated by $0.5 < HCFI \leq 0.8$. The range $0.2 < HCFI \leq 0.5$ refers the moderate condition of HCF and the poor condition is experienced by those blocks having the HCFI range of $0 \leq HCFI \leq 0.2$.

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Ranking of the HCFI has been done (after Kendall's method) to identify the position of each block in the district. In order to investigate which blocks are close to each other based on HCIPR, DPR, BPR, DHCIR and BHCIRindicators, we have used the tool of cluster analysis (SPSS Software-20) following squared Euclidian distance method. Finally, to show the possible clusters of the blocks we have drawn the Dendrograms adopting average linkage method.

1.3 STUDY AREA AT A GLANCE

The geographical coordinates (District Statistical Handbook Burdwan, 2007, p.1) of Burdwan district are 22°56′ N 86°48′ E to 23°53′ N 88°25′ E (Fig: 1). It has an area of 7,024 km^2. The population size and density of the district are 77,17563 (Male-51.40% & Female- 48.60%) and 1,099/km^2 respectively (Census of India, 2011). Total rural and urban population are 60.11% & 39.89% respectively. The literacy rate of the district is 76.21% in which male is 82.42% and female is 69.63%. Total number of blocks and police stations are 31 & 33 respectively (District Statistical Handbook Burdwan, 2012).

RESULTS AND DISCUSSION

1.4 Population Served by Health Care Institution (HCIPR)

The indicator Health Care Institution Population Ratio (HCIPR) is used to refer the number of persons served by a medical/health institution. The study reveals that Burdwan-I block enjoys the first position, where per lakh population is served by 9 HCIs. In contrast, the worst condition is experienced by Monteswar, where per lakh population is served by only 1 HCI followed by Ketugram-I and Purbasthali-I. The rest of the blocks are in moderate condition.

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1.5 Doctor Population Ratio (DPR)

The term Doctor Population Ratio (DPR) signifies number of doctors available per lakh persons. Higher the value of DPR represents higher the facility. Doctor is the main instrument in health care delivery system. Once again Burdwan-I block possesses the first position having 75 doctors per lakh persons whereas; Burdwan-II block experiences the last position having only two doctors followed by Jamalpur. The remaining blocks are in the poor condition category and the range of doctors per lakh persons is 3-16 in these blocks.

1.6 Bed Population Ratio (BPR)

Bed Population Ratio (BPR) indicates number of beds available per ten thousand persons. It is another important indicator to frame the health care facility. On the basis of this parameter, Burdwan-I stands first having 35 beds per ten thousand persons. In contrast, the worst condition is observed in Ketugram-I block where only one bed is available per ten thousand persons followed by Burdwan-II and Katwa-II. Other blocks are in moderate.

1.7 Doctor Health Care Institution Ratio (DHCIR)

The term Doctor Health Care Institution Ratio (DHCIR) depicts number of doctors available per health care institution (HCI). Higher DHCIR indicates that higher number of patients will be attended by doctor. We observes that the availability of doctor is higher in Burdwan-I block i.e. 7. The worst condition of this parameter is observed in Kalna block where not a single doctor is available per HCI. The moderate condition is experienced by rest of the blocks.

1.8 Bed Health Care Institution Ratio (BHCIR)

Bed Health Care Institution Ratio (BHCIR) refers to number of beds available in a HCI. There are thirty six beds available in Burdwan-I block per HCI. In contrast, Burdwan-II is in poor condition in terms of availability of beds per, where only five beds are available. The remaining blocks are in moderate position.

Table 2: Description of the Health Care Facility indicators of eastern part of Burdwan district

Descriptive Statistics	HCIPR	DPR	BPR	DHCIR	BHCIR	HCFI
Mean	3.356	8.738	5.171	2.072	12.332	0.161
Median	2.573	4.464	2.600	1.900	10.583	0.108
S.D.	1.989	16.353	7.872	1.502	7.093	0.215
CV	59.269	187.144	152.250	72.505	57.520	133.01
Min	1.685	2.615	1.270	0.529	5.750	0.036
Max	9.807	75.065	35.703	7.654	36.404	1.000

Source: Authors' computation

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The table-2 indicates that in an average there are three health care institutions per lakh people in the eastern blocks of Burdwan district and the range of HCI is 8. There are in an average eight doctors available per lakh people and range of doctors is also very high i.e. 73 and the data is less consistence. It indicates some blocks don't have the average number of doctors of the district. The average number of bed available per ten thousand people is 5 where, the maximum and minimum values are 35 and 1 respectively and the value of C.V. is also less consistence in this case. In the district, average number of doctor per HCI is 2. In the view of this parameter, it is found that some blocks don't enjoy a single doctor in HCI. The average number of bed per HCI is 12 whereas; the range is 31. The impact of all the indicators is reflected by the HCFI. The average value of HCFI is found to be 0.16. The maximum and minimum values are 1.00 and 0.03 and it should be noted here that the value of C.V. is also less consistence and not reliable. We find that the minimum value of HCFI is less than the average value of HCFI and which refers that the impact of HCFI is not good in the eastern part of Burdwan district.

Table 1: Health care Facility Index (HCFI) of eastern blocks of Burdwan district, 2011-2012

C.D. Block	HCFI	Rank	Remarks
Purbasthali-I	0.108	11	Very Poor
Purbasthali-II	0.119	6	Very Poor
Kalna-I	0.166	3	Very Poor
Kalna-II	0.094	13	Very Poor
Monteswar	0.113	8	Very Poor
Mongalkote	0.109	10	Very Poor
Ketugram-I	0.052	18	Very Poor
Ketugram-II	0.099	12	Very Poor
Katwa-I	0.380	2	Poor
Katwa-II	0.066	16	Very Poor
Memari-I	0.119	7	Very Poor
Memari-II	0.129	5	Very Poor
Jamalpur	0.062	17	Very Poor
Raina-I	0.091	14	Very Poor
Raina-II	0.130	4	Very Poor
Khandaghosh	0.086	15	Very Poor
Burdwan-I	1.000	1	Perfect
Burdwan-II	0.036	19	Very Poor
Bhatar	0.111	9	Very Poor

Source: Authors' computation

1.9 Overall Condition

Overall condition has been traced considering all the five indicators of health care facility. We find from the HCFI that the Burdwan-I block is on the top position (Perfect HCF) having the value of HCFI of 1.00. The poor HCF is observed only in Katwa-I block and rest of the seventeen blocks are in very poor condition. There is not a single block enjoys either moderate or

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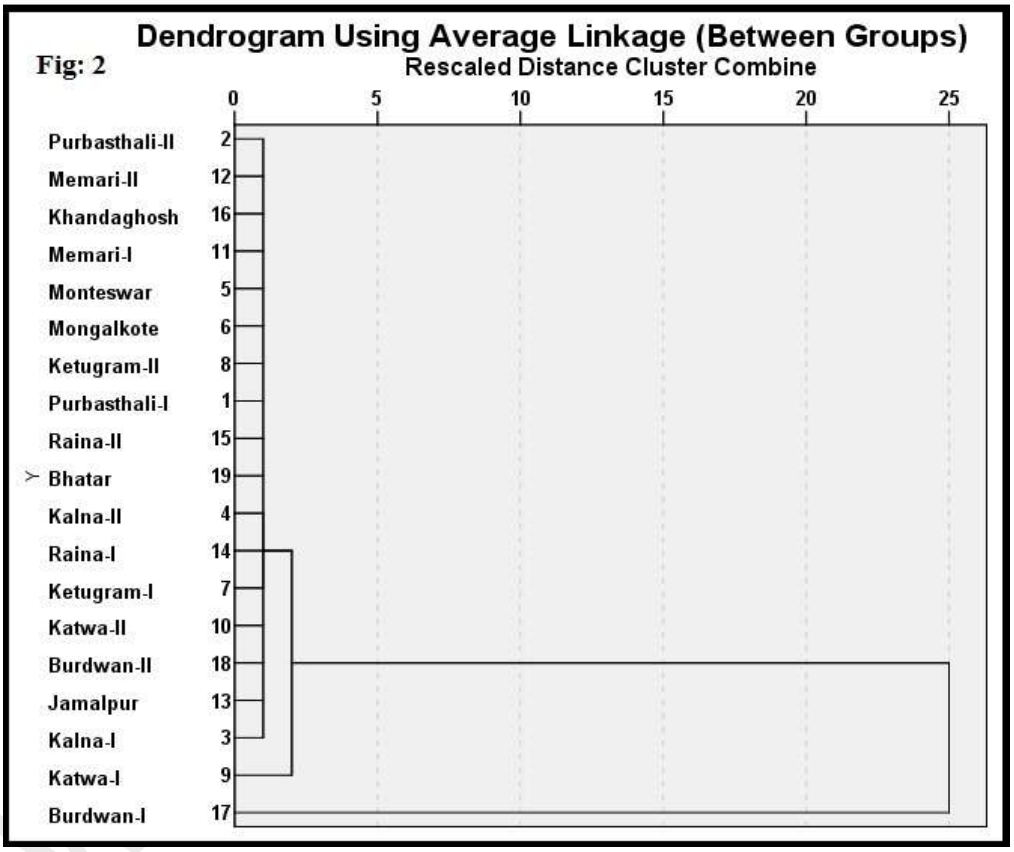
good condition. We find that there is huge gap of HCF across the eastern blocks of Burdwan district.

2.0 CLUSTER ANALYSIS

We cannot identify the similarity among the blocks in terms of the multiple indicators of HC based on the value of Health Care Facility Index (HCFI). To this end we have done cluster analysis for the indicators of HCF following specified methodology. The result of cluster analysis is presented by the Dendrogram denoted by figure 2. In the analysis, we consider three possible clusters. Burdwan-I makes a distinct cluster itself because there is no one block in the eastern part of Burdwan district which is parallel to it. In contrast, Katwa-I makes a cluster for its own and remaining blocks fall in the third number cluster. If we consider 5 point scale of dissimilarity, we find that except Burdwan-I block all the blocks fall in same cluster. It is clear from the diagram that except Burdwan-I block there is no other block enjoying the parallel health care facility as enjoyed by the Burdwan-I block.

Fig: 2



2.1 CONCLUSION

The study reveals a huge gap in terms of health care facility across the blocks. The HCFI of Burdwan-I block i.e. 1.00 seems to be an out layer compared to the other blocks because the second highest and lowest values of HCFI are 0.38 and 0.036 respectively (Table: 2) and the range of HCFI is 0.964. The value of range actually indicates the deviation of HCF across the blocks. The study confirms that seventeen blocks out of nineteen belong to very poor condition

as their HCFI values lay in between 0.036 to 0.166. The perfect HCF of Burdwan-I block is for existence of medical college and district hospital. The blocks having the adjacency to Burdwan-I block enjoy the medical facility of Burdwan-I. The study also reveals that the concentration of health care facility is found in Burdwan-I block. So, decentralization of HCF is required across the blocks to provide good HCF to the people of each block.

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