

Chapter III : Health and health care

3.1 Health care infrastructure in Birbhum vis-à-vis West Bengal

The public health care infrastructure of Birbhum district consists of 58 Primary Health Centres (PHCs) located in various blocks, 15 Block Primary Health Centres (BPHCs) located at the headquarters of the Blocks, 4 Rural Hospitals (RH) which are better equipped than the BPHCs and located at block headquarters, 2 Sub-divisional hospitals situated in 2 subdivisions and the district hospital located at the district headquarter (Table 3.1). Out of 58 PHCs, only 15 have in-patient care facility. There are 392 beds in the PHCs, 340 in the BPHCs, and 170 beds are available in the RHs – altogether 902 hospital beds distributed among 77 health facilities located in the rural areas serving mainly the rural population in the district. Out of 4 RHs, there are two rural hospitals, namely, Sainthia and Dubrajpur, which also serve the urban population of these areas.

In the urban areas, 520 beds are available in the district hospital and 411 beds are in the two sub-divisional hospitals. Besides, 396 beds are available in the private sector nursing homes, 382 beds in other hospitals, which means a total of 1709 hospital beds distributed among 47 secondary and tertiary level healthcare facilities in urban Birbhum. Thus, from the projected population of 2006, it can be inferred that while in the rural areas one hospital bed is to serve 3301 persons, in urban areas 157 persons are served per bed. In comparison with West Bengal as a whole, though fewer persons are served per bed in both rural and urban Birbhum (state averages are 4666 and 296 persons per bed), on the whole 1243 persons are served per bed in Birbhum district compared to 931 persons per bed in West Bengal as a whole. In other words, there are about 0.8 beds per 1000 population in Birbhum compared to 1 bed per 1000 population in the state as a whole. On the whole, this indicates that more beds are required in both rural and urban areas in the district.

Birbhum clearly needs more doctors to raise its doctor-population ratio to the level of the average for the state as a whole (combining rural and urban areas). There are about 8 doctors per 100,000

persons in Birbhum, whereas the number of doctors per 100,000 persons for the state as a whole is 46, more than ten times as many. Even in the neighboring district of Burdwan there are more than 14 doctors per 100,000 people. It seems that the existence of a government teaching hospital makes substantial difference in terms of these indicators, and there is no such medical college and hospital in Birbhum. Similar observations can be made regarding relative concentration of para-medical personnel in Birbhum vis-à-vis West Bengal.

Table 3.1: Health Infrastructure in Birbhum vis-à-vis West Bengal

Type of the Facility	Birbhum		West Bengal	
	Total No. of Institutions	Total No. of Beds	Total No. of Institutions	Total No. of Beds
Sub Centres	484	Nil	10356	Nil
PHCs with only OPD facility	43	Nil	922	5247
PHCs with indoor facility	15	NA		
BPHCs	15	301	241	3475
Rural Hospitals	4	170	93	3468
Sub-Divisional Hospitals	2	413	45	6823
State General Hospital	Nil	Nil	34	3127
District Hospital	1	500	15	6567
Medical College	Nil	Nil	9	10396
Other Hospitals	1 *	NA	32	7223
Population served per bed	1243		931	
Doctors per 100,000 population	8		46	
Estimated population in 2006	2977103		62359244	

Source: District Health Action Plan, 2007-08 and Health on the March, 2005-06

*District Police Hospital

3.2 Rural health infrastructure and shortfall

In the provision of public healthcare infrastructure in India, ensuring equity in access to all population sub-groups has been the central theme. For this reason, the healthcare facilities across country

– their number and location – have been defined in terms of some population norms. According to the norm there should be one Sub-centre (SC) for every 5000 population (3000 population in case of hilly and tribal areas), one Primary Health Centre (PHC) for every 30,000 population and one Community Health Centre (or Rural Hospital) (CHC or RH) for every 100,000 to 120,000 population. In Birbhum, the population density varies significantly across the blocks. Among the three subdivisions, blocks in the Rampurhat subdivision have the highest population density and the highest aggregate population in the district in comparison with the blocks of other two subdivisions. However, the physical infrastructure of public healthcare institutions and health care personnel in Rampurhat do not appear to be substantially larger than the healthcare resources supplied to the less populated blocks in the district. For example, there are 627 hospital beds and 81 doctors in Rampurhat Sub-division, whereas there are 1173 hospital beds and 103 doctors positioned in Suri Sadar subdivision which has the second highest aggregate population but the lowest population density in the district. Because of these factors, the system loads borne by lower level healthcare institutions are unequal and limiting the access of the people on the one hand and affecting the quality and delivery of healthcare services on the other. Thus, analysis of such block level disparity in health care infrastructure would help to identify specific deficiencies and suggest corrective measures to improve the health care system in the district.

Since population and the total number of healthcare institutions vary widely across different blocks of the district, the ratio between the population and the number of healthcare institutions such as BPHCs that provide both in-patient and out-patient facility and PHCs and SCs that basically provide out-patient care, also vary substantially. It is worth noting that out of 58 PHCs in the district, only 15 PHCs have necessary infrastructure to provide in-patient care. Though every PHC in the district serves about 53,000 people, which indicates moderate system load, the distribution is extremely uneven – ranges from as high as 89,000 persons per PHC in Murarai-I to about 35,000 in Sainthia. Other PHCs which have very high system load include the PHCs belonging to Nalhati-I, Mayureshwar-I, Illambazar, Nanoor and Bolpur-Sriniketan. PHCs of these blocks have to bear very high system load as these PHCs serve densely populated regions of the district except Illambazar. Because of the high system load in the PHCs of these blocks, patients are often compelled to travel to the BPHCs

or nearby RHs or SDHs not only for in-patient care but also to obtain out-patient care, which in turn increases the system load in the higher level healthcare facilities. They have no other choice but to go to the private nursing homes and other providers to seek treatment in the subdivisions and district headquarter if they don't find any place in the over-loaded RHs or SDHs. Although nowhere in the country do we find that the desired national norm of PHC-population ratio is satisfied, other blocks in the district have a more favourable PHC to population ratio compared to the blocks mentioned above. As indicated, Sainthia block holds the best position in terms of PHC-population ratio followed by Rajnagar, Md. Bazar, Mayureswar-II and Suri-II.

Mismatch between the healthcare facilities existing in blocks and the current population of the corresponding blocks are clearly observed if we compute the requirements of PHCs, SCs and Female Health Assistants (HAF) on the basis of projected current population of the blocks. On the whole, each block of the district should be served by more than 5 PHCs under the existing national norms instead of the present average per block, which is just above 3 per block. In regional terms, the largest shortfall in the number of PHCs is observed in the populous Nalhati-I block followed by Murarai-I in Rampurhat sub-division and Bolpur-Sriniketan and Nanoor blocks in Bolpur sub-division. Nalhati-I block requires 5 additional PHCs and other aforesaid blocks require another 4 PHCs under the existing norm. On the other hand, the corresponding gaps are among the lowest in Mayureswar-II, Md. Bazar, Sainthia, Rajnagar, Suri-II and Labhpur. Each of these blocks requires one additional PHC following the existing PHC-population norm.

Table 3.2: Shortfall of health infrastructure and personnel in rural Birbhum

Blocks	projected population 2007	No. of PHC	Peopled on per PHC	No. of Sub-centres	No. of HA (F) (Available)	No. of HS (F) (Available)	No. of PHCs/ 30000 pop	No. of SCs/ 5000 pop	No. of PHAs/ 1000 pop	Req. no. of PHCs (addit. total)	Req. no. of SCs (addit. total)	Req. no. of HA(F) (addit. total)	shortfall of PHCs	shortfall of SCs	Shortfall of HA(F)
Nalhati-I	250616	3	83539	35	33	6	0.36	0.70	0.13	8	50	251	-5	-15	-218
Nalhati-II	120002	2	60001	18	15	4	0.50	0.75	0.12	4	24	120	-2	-6	-105
Murari-I	177255	2	88628	27	18	4	0.34	0.76	0.10	6	35	177	-4	-8	-159
Murari-II	200924	4	50231	29	26	7	0.60	0.72	0.13	7	40	201	-3	-11	-175
Majureswar-I	155768	2	77884	23	23	6	0.39	0.74	0.15	5	31	156	-3	-8	-133
Majureswar-II	122522	3	40841	20	18	2	0.75	0.82	0.15	4	25	123	-1	-5	-105
Rampurhat-I	176269	4	44067	27	27	6	0.68	0.77	0.15	6	35	176	-2	-8	-149
Rampurhat-II	172292	3	57431	28	27	6	0.52	0.81	0.16	6	34	172	-3	-6	-145
Md. Bazar	155508	4	38877	25	22	9	0.77	0.80	0.14	5	31	156	-1	-6	-134
Sairbia	174963	5	34993	33	33	5	0.86	0.94	0.19	6	35	175	-1	-2	-142
Dubajpur	175901	4	43975	30	29	6	0.68	0.85	0.16	6	35	176	-2	-5	-147
Rajnagar	75094	2	37547	16	16	3	0.80	1.07	0.21	3	15	75	-1	1	-59
Suri-I	110084	2	55042	16	16	4	0.55	0.73	0.15	4	22	110	-2	-6	-84
Suri-II	85120	2	42560	14	14	4	0.70	0.82	0.16	3	17	85	-1	-3	-71
Khoynasole	143570	3	47857	24	20	4	0.63	0.84	0.14	5	29	144	-2	-5	-124
Bolpur-Sriniketan	195847	3	65282	30	28	6	0.46	0.77	0.14	7	39	196	-4	-9	-168
Lahpur	192524	5	38505	31	20	6	0.78	0.81	0.10	6	39	193	-1	-8	-173
Nanooor	210827	3	70276	34	34	6	0.43	0.81	0.16	7	42	211	-4	-8	-177
Ilambazar	162037	2	81019	24	20	7	0.37	0.74	0.12	5	32	162	-3	-8	-142

As far as Sub-centres (SCs) are concerned, the highest shortfall is observed in Nalhathi-I (shortfall of 15) followed by Murarai-II (shortfall of 11) and Bolpur-Sriniketan (shortfall of 9). There are a number of blocks, such as Murarai-I, Mayureshwar-II, Rampurhat-I, Labhpur, Nanoor and Illambazar, which require additional 8 SCs under the existing norm. The most favourable position in terms of SCs per 5,000 population is held by Rajnagar, which has one more sub-centre than its requirement. The other two blocks which have lowest shortfall are Sainthia and Suri-II. On an average, every block needs to add 7 SCs to the existing ones. The requirements of such a significant number of SCs indicate that a very large section of rural population is deprived of basic healthcare, and they require travelling to nearby PHC or BPHC in order to obtain primary healthcare bearing direct and indirect costs.

The infrastructure of the sub-centres in the district is not up to the mark. It has been found that about 36 per cent of the sub-centres do not have own building, 43 per cent do not have electricity connection, 22 per cent do not have any toilet facility and about 7 per cent run without water supply. In spite of that, the average clinic attendance is found to be high (Table 3.3).

Table 3.3: Status of Sub-Centres in the district, 2006

GP HQ Sub-Centres	167
Non HQ Sub-Centres	317
Number & percentages of SCs in rented house/clubs	177 (36.6)
Number & percentages of SCs without electricity	212 (43)
Number & percentages of SCs without water supply	33 (7)
Number of SCs without toilets	189 (22)
Average clinic attendance per day	232

Note: numbers in the parentheses denote percentages out of total SCs.

The norm regarding female health assistant (FHA) per 1,000 population is not followed in most of the states in India, and Birbhum is no exception. The rural health personnel play a significant role in educating rural population about various health related matters in general and about reproductive health matters, in particular. Services of these personnel would significantly improve the healthcare-

seeking behaviour and guide patients to the referral system. The analysis shows that according to the norm, the requirement of these field staff is huge in every block ranging from 218 in Nalhati-I to 59 in Rajnagar. Even if we consider the sanctioned, existing and vacant positions of FHAs currently (not shown in the Table), it can be seen that about 8 percent posts of field personnel are lying vacant. Out of 484 sanctioned posts, 446 are in position. The number of vacant positions of FHAs is very high in Murarai-I followed by Khoyrasole.

All these evidences again indicate that due to the inadequacies of physical infrastructure and field staff a substantial proportion of rural population of the district live beyond the reach of the healthcare system. The analysis shows that the requirements of PHCs, SCs and FHAs are the highest in the Rampurhat subdivision followed by Bolpur subdivision because the size of population and the population density are the highest in Rampurhat subdivision, which affects the distribution and allocation of health facilities and therefore deviated significantly from the existing national norm.

Besides the mismatch of institutional network of hospitals, PHCs and SCs in the blocks, the quality and effectiveness of healthcare delivery are also affected by the disparity between the postings of medical officers and other para-medical staff and also by the availability of hospital beds in the facilities. It can be observed that for some of the densely populated blocks of Rampurhat subdivision such as Nalhati-I and II, Murarai-II and Mayureswar-I, the number of doctors per lakh population is about 2, which is well below the norm. Similar doctor-population ratio is found in Suri-I, Khoyrasole and Nanoor. Although low doctor-population ratio in Nalhati-I and Suri-I is mitigated by its proximity to urban healthcare facilities located at Nalhati and Suri towns, low doctor-population ratios in other blocks indicate the paucity of rural healthcare personnel in these blocks. Relatively better doctor-population ratio has been observed in most of the blocks of Suri subdivision such as Sainthia, Rajnagar and Suri-II. Better doctor-population ratio has also been seen in Mayureswar-II and Bolpur-Sriniketan. As in the case of doctor-population ratio, the populous blocks of the district have fewer paramedical personnel. It can be observed from the Table 3.4 that generally the number of nurses and other paramedical personnel are also higher in those blocks where the doctor-population ratios are relatively better, although there are exceptions too.

Similarly, some variations regarding availability of hospital beds have also been observed in different blocks. Except Sainthia, which has high availability of 5 beds per 10,000 population, the figures for the other blocks in the district range from 2 to 4 beds per 10,000 population. As observed in the cases of other health infrastructural indicators, the bed-population ratio is also lower in the most of the densely populated blocks of Rampurhat subdivision such as Nalhati-I, Murarai-II, Mayureswar-I and Rampurhat-I in comparison to the others. Other blocks which have low bed-population ratios are Suri-I, Khoyrasole and Nanoor. Other blocks of Suri and Bolpur subdivisions have relatively more favourable bed-population ratios as observed from Table 3.4. On the other hand, more than 95 per cent of beds in the private sector are located in the urban areas and about 70 per cent among them are positioned either at the district headquarter or at two subdivisions (Office of the CMOH, Birbhum 2007). Hence in overall terms, blocks belonging to Suri and Bolpur subdivision are better placed in terms of hospital beds for patients, while the blocks in the populous Rampurhat subdivision offer least assured coverage to patients who require hospitalization.

Table 3.4: Health care infrastructure in rural Birbhum by blocks, 2007

Blocks	Projected population 2007	No. of PHC	No. of Medical Officers available including PHC	No. of other paramedical staff	Staff nurse (No.)	No. of hospital beds	Doctors/ 100000 pop	Other paramedical staff/ 100000 pop	Nurse/ 100000 pop	Beds/ 10000 pop
Nalhati-I	250616	3	6	4	16	47	2	2	6	2
Nalhati-II	120002	2	3	5	7	31	2	4	6	3
Murarai-I	177255	2	6	7	18	66	3	4	10	4
Murarai-II	200924	4	5	6	13	47	2	3	6	2
Mayureswar-I	155768	2	3	5	9	31	2	3	6	2
Mayureswar-II	122522	3	6	4	11	52	5	3	9	4
Rampurhat-I	176269	4	6	8	13	43	3	5	7	2
Rampurhat-II	172292	3	6	6	11	52	3	3	6	3
Md. Bazar	155508	4	5	5	14	62	3	3	9	4
Sainthia	174963	5	10	7	30	102	6	4	17	6
Dubrajpur	175901	4	8	4	17	58	5	2	10	3
Rajnagar	75094	2	4	5	11	31	5	7	15	4
Suri-I	110084	2	2	6	9	27	2	5	8	2
Suri-II	85120	2	4	5	11	31	5	6	13	4
Khoyrasole	143570	3	3	4	14	37	2	3	10	3
Bolpur-Sriniketan	195847	3	5	7	23	86	3	4	12	4
Labhpur	192524	5	9	4	23	60	5	2	12	3
Nanoor	210827	3	5	6	13	37	2	3	6	2
Illambazar	162037	2	7	5	13	46	4	3	8	3

On the whole, it may be inferred from the present analysis that there is a substantial gap in physical infrastructure as well as paucity of health personnel in the populous blocks of the district and require special attention. In the case of other blocks, it seems that the existing facilities are possibly adequate to meet current healthcare demand. It should also be kept in mind that due to such inadequacies of facilities a large section of the rural population may either seek alternative healthcare from private practitioners (qualified or unqualified), traditional healers or simply do not seek any treatment due to the variety of constraining factors.

3.3 *Performance of District Hospital, Sub-divisional Hospitals, Rural Hospitals and Block Primary Health Centres*

Referral healthcare system in Birbhum district comprises 15 Block Primary Health Centres (BPHCs) and 4 Rural Hospitals (RHs) located at 19 block headquarters to serve the rural areas, 2 Sub-Divisional Hospitals (SDHs) at Bolpur and Rampurhat and the District Hospital (DH) at Suri. BPHCs are the first referral point from the Primary Health Centres (PHCs) or Sub-Centres (SCs) situated in the villages. These BPHCs are supposed to be better equipped in terms of more doctors and nurses, and other para-medical personnel and also have the facility of in-patient care (in other words, hospital beds) in accordance with the size of population composition. The performance indicators such as bed occupancy rates¹ and bed turnover rates² of the BPHCs for the last two years (see Figure 3.1) suggest that out of 15 BPHCs, bed occupancy rates and bed turnover rates are higher than the standard rates for only 5 and 9 BPHCs respectively. In-patient care facilities in as many as 5 BPHCs, namely, Bara Chaturi, Bolpur-Sriniketan, Chakmandola, Lohapur, Nakrakonda and Satpalsa, are grossly underutilized, whereas such facilities in Illambazar, Nanoor, Rajnagar and Paikar are over-utilized. This creates unequal pressure on the existing institutional network of healthcare system in the district. In case of out-patient care, similar patterns of utilization have been observed for these BPHCs. The underutilization may occur due to a variety of reasons, such as non-availability of doctors and support staff, equipments, medicine, and physical proximity to the RHs/SDHs/DH which make it easy for patients to bypass lower level facilities. Underutilization of most of the lower level facilities creates excessive pressure on the existing rural hospitals (RHs) and sub-divisional hospitals (SDHs) for in-patient care as observed from the indicators such as bed-occupancy rates and bed-turnover rates in the Rural and Sub-divisional hospitals.

¹ Bed occupancy rate is defined as the number of hospital bed days divided by the product of the number of available hospital beds and the number of days in a year.

² Bed Turnover Rate gives the number of patients using one bed in a time span of a year.

Figure 3.1: Performance Indicators of BPHCs in Birbhum

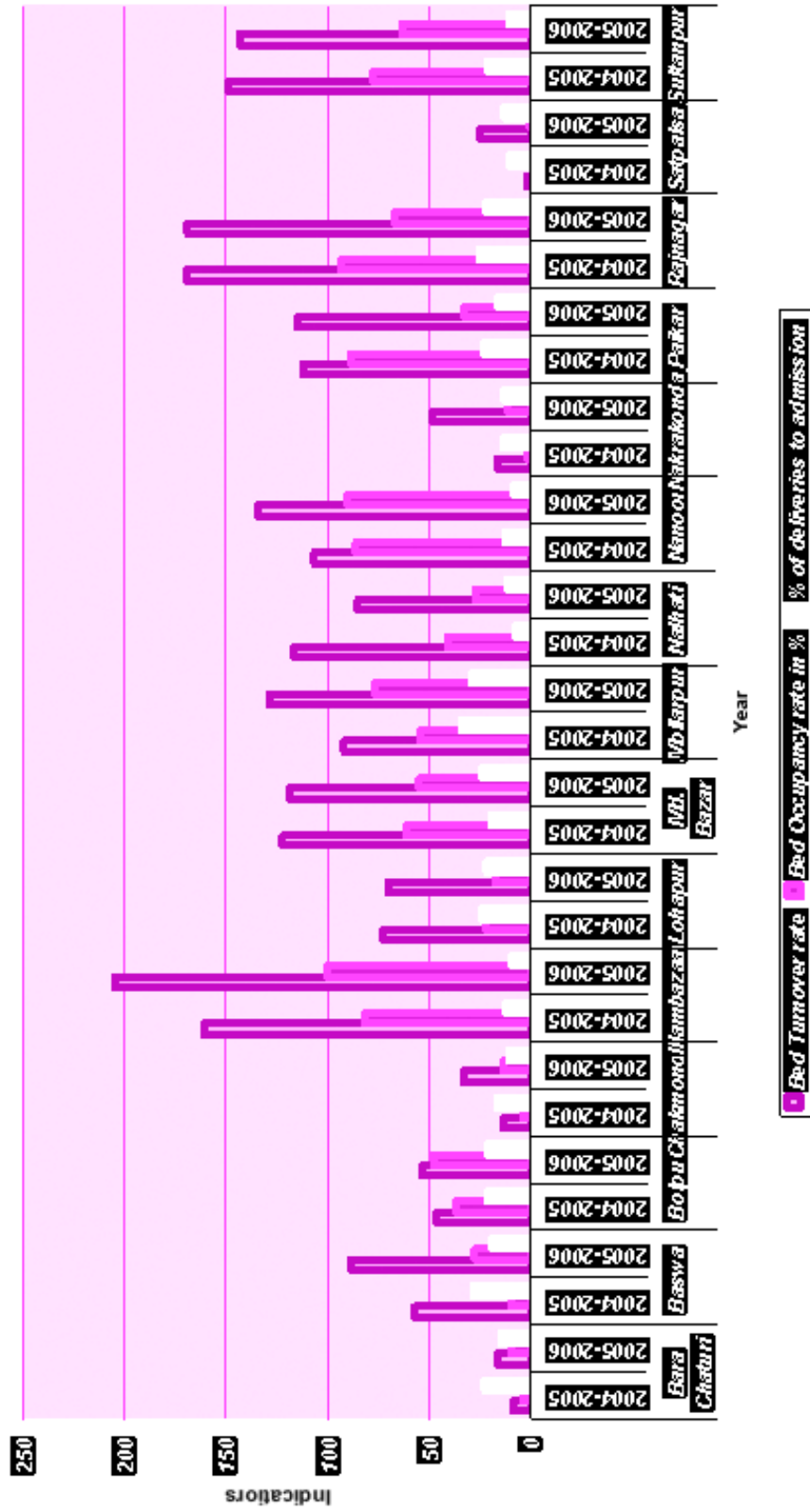
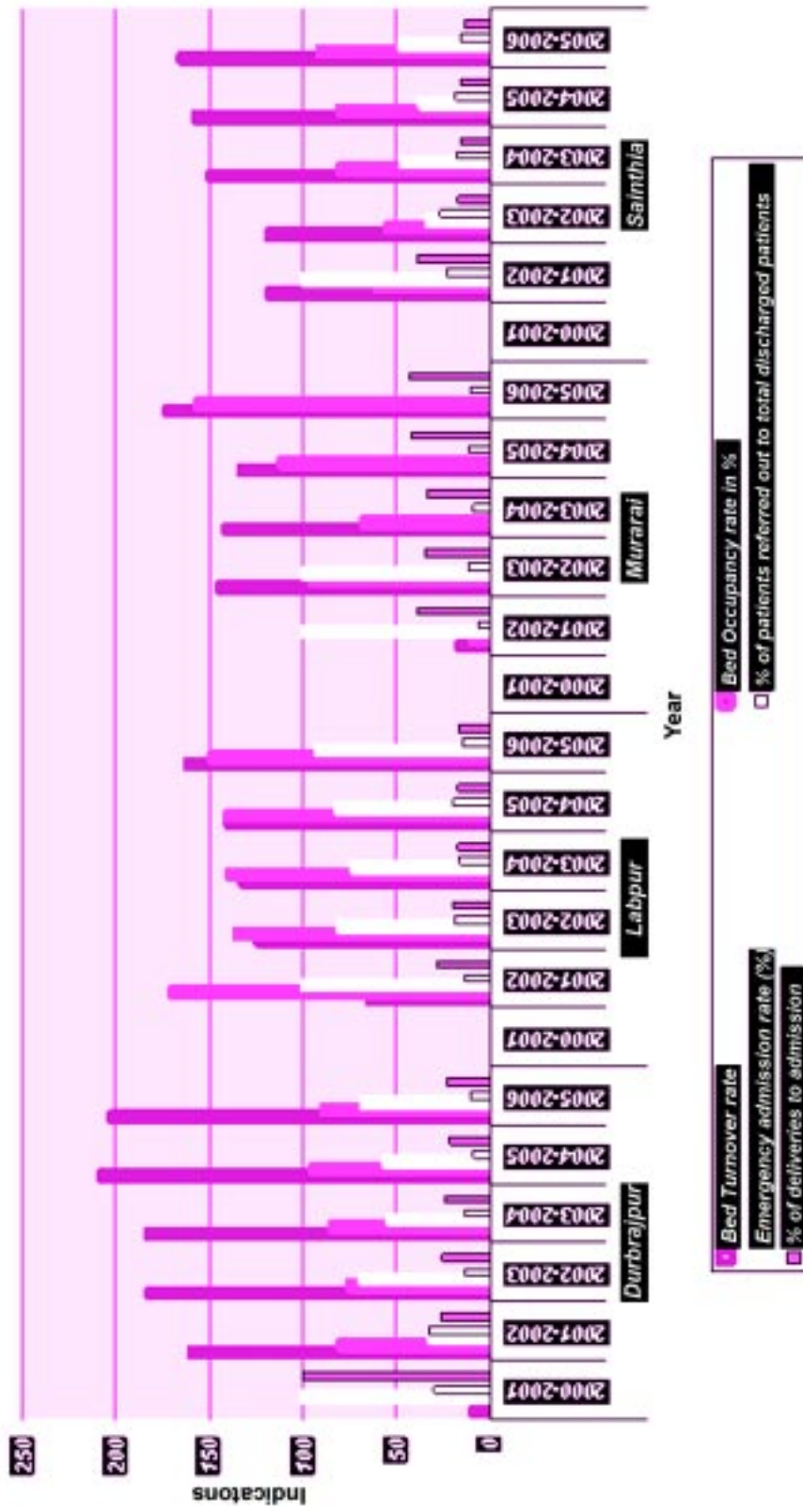


Figure 3.2: Performance Indicators of Rural Hospitals (RHs) in Birbhum

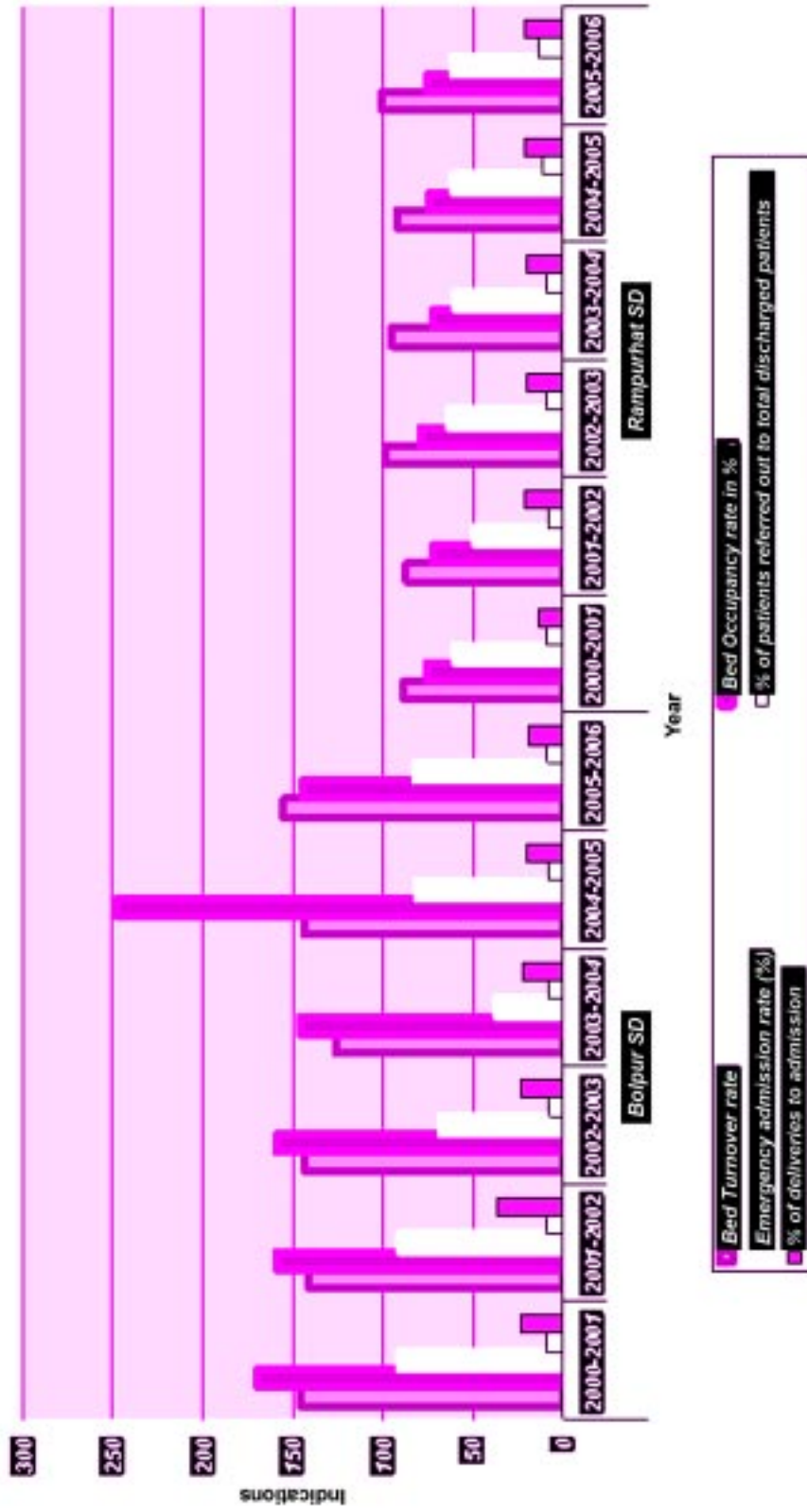


Among the four RHs, one is located in the northern part (Murarai) of the district; another in the middle (Sainthia) and the other two in the southern part (Dubrajpur and Labpur) of the district. These Rural Hospitals should be better operational for the in-patient care in terms of more doctors, support staff and number of beds than the BPHCs/PHCs. They act as referral units for the BPHCs/PHCs and also serve the people in those blocks where they are situated so that the system load on the District and Sub-division hospitals is somewhat relieved. It is evident from the Figure 3.2 that bed occupancy and bed turnover rates are significantly high in all these rural hospitals in the recent years. In addition to in-patient care, utilization of out-patient care is also reasonably high in these RHs in the recent years, especially in Sainthia and Murarai RHs. This clearly indicates the gross inadequacy in the infrastructure of the rural hospitals and the asymmetry between demand for and supply of healthcare in the rural areas. For example, Murarai RH serves most densely populated regions of the district with only 66 beds and only 4 medical officers positioned at present. Very high bed occupancy rates in Labhpur and Murarai reflect that the overload of patients frequently causes multiple bed occupancy. The concurrence of exceptionally high bed turnover and occupancy rates implies that either there is a high flow of referred patients to these RHs from the BPHCs/PHCs or people from the rural areas directly come to the RH to obtain in-patient care bypassing lower level institutions located at the blocks, as mentioned earlier. Besides, the emergency admission rates for other hospitals in the recent years (recent data on Murarai RH is not available) are much higher than the standard norm, thereby indicating that the patients brought to the RHs are often in the critical stage.

It is interesting to note that, bed occupancy rates as well as bed turnover rates were substantially higher in the Sub-divisional hospitals than the District hospital during the last six years. Bolpur sub-divisional hospital has recorded phenomenally high bed occupancy rates, bed turnover rates and emergency admission rates in the successive years that sharply exceed the standard rate. Rampurhat sub-divisional hospital has also recorded higher bed occupancy and bed turnover rates than the district hospital during the past six years. It is therefore apparent that the referral healthcare systems in the subdivisions are heavily overloaded and the district hospital operates with a slack. The district hospital located at Suri has 520 beds. But its location is in the middle of the district and accessible mainly by road network. Apart from the referred patients from other lower level referral units, it serves Rajnagar, Md. Bazar and Suri-I blocks, mainly because of contiguity of these areas, and also the urban areas of Suri. Bolpur and Rampurhat sub-divisional hospitals have only 125 and 285 beds respectively and located in southern and northern parts of the district, respectively. They are well connected with rail as well as road network and thus provide easy access to the people of not only the district but also

nearby areas of contiguous districts. Very high bed turnover rates of both the sub-divisional hospitals indicate high system load from short-term patients on the one hand and very high bed occupancy rate points out multiple occupancy of beds, on the other. It can be noted that the emergency admission rates for the district hospital as well as the other two sub divisional hospitals are substantially higher than the standard rates. As these hospitals function as secondary referral, the percentage of patients referred to these hospitals is significantly high excepting Rampurhat sub-divisional hospital. High emergency admission rates as well as high percentages of patients referred to these institutions imply that patients admitted to these institutions are most likely in critical condition when referred from the lower level referral units.

Figure 3.3: Performance Indicators of Sub-Division Hospitals



The proportion of patients in the population of a block may also vary due to micro agro-climatic factors at the local level and that may influence local endemicity of diseases and morbidity patterns and thus utilization of health services. In addition to these factors, local level accessibility (physical as well as perceived) also affects utilization of healthcare services. Nevertheless, it may thus be inferred that while most of the rural healthcare facilities i.e. BPHCs/PHCs in the district are still relatively underutilized, rural hospitals (RHs) and the sub-divisional hospitals (SDHs) are generally over-utilized. Despite patient (both in-patient and out-patient) overload in the rural hospitals and the sub-divisional hospitals, most of the cases are handled at these hospitals without referring them to the district hospital.

Table 3.5: Performance indicators of Suri Sadar (District) Hospital, Birbhum

Indicators	Year					
	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006
Bed Turnover rate	79.18	64.71	69.64	66.84	72.52	77.4
Bed Occupancy rate in %	78.05	63.69	67.01	63.76	71.86	78.3
Emergency admission rate(%)	71.9	74.22	72.18	72.63	78.12	81.4
% of patients referred out to total discharged patients	1.08	1.66	2.27	2.24	2.11	2.5
% of patients referred in to total inpatients	10.29	13.62	13.01	12.17	11.04	11.5
% of deliveries to admission	18.16	22.01	21.45	21.25	20.32	19.9

Source: *Health on the March, Govt. of West Bengal for various years*

3.4 Prevalence and incidence of various communicable diseases in Birbhum

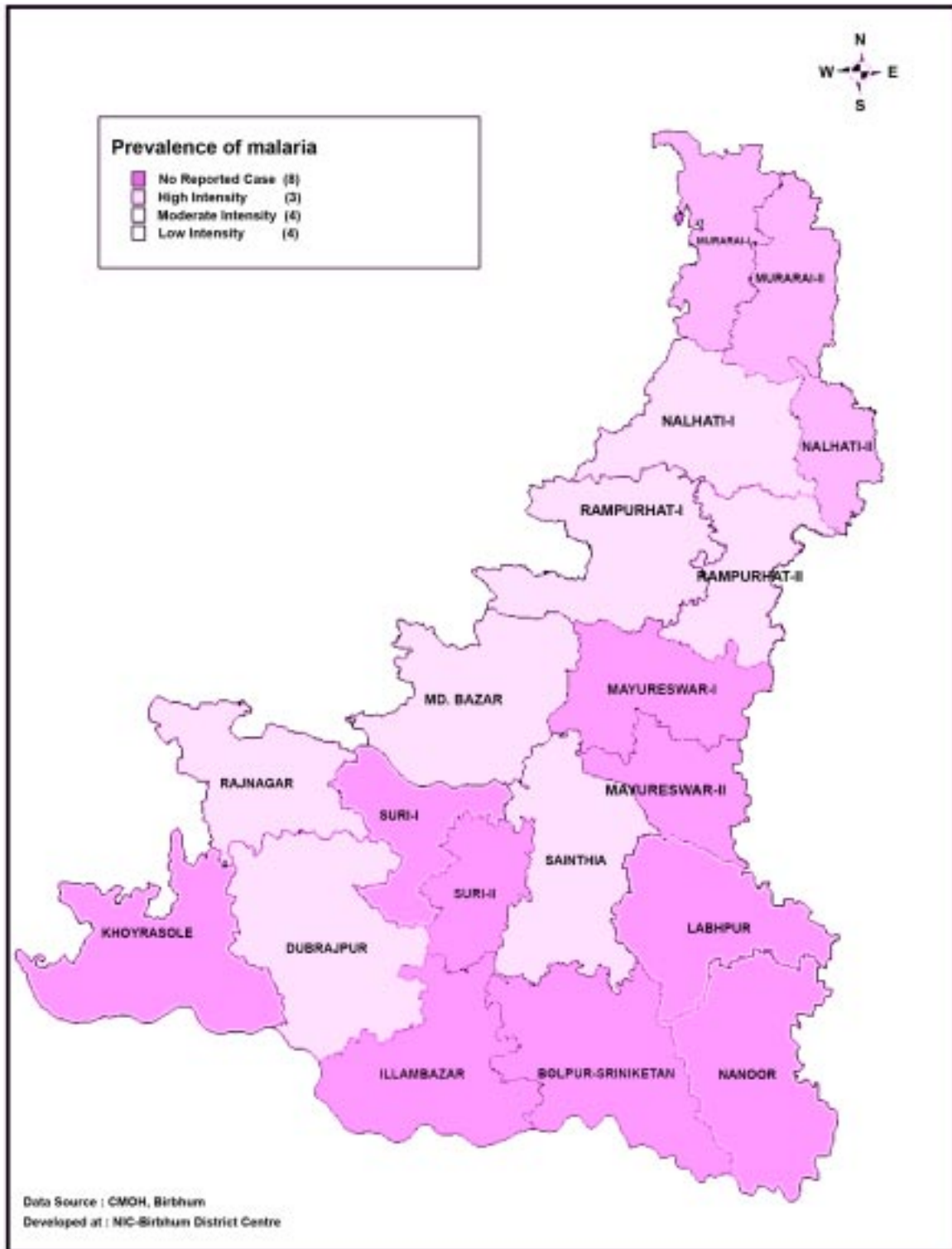
Malaria

Malaria is a potentially life threatening parasitic disease and has been one of the major public health problems in India. West Bengal is one of the largest contributors of reported malaria infections and deaths in the country. Incidence of malaria in Birbhum district has been found to be high, especially during and after its resurgence in 2003 in the whole State and continued to be high thereafter. Five blocks are endemic area of malaria covering more than 5 Lakhs of population. These are Rampurhat-I, Md. Bazar, Sainthia, Rajnagar

and Dubrajpur. All other 14 blocks and municipalities are more or less affected with malaria but not endemic in nature. The resurgence of malaria in this district is primarily due to the occurrence of flood during 2002 which gave rise to both *P. Vivax* (Pv) and *P. Falciparum* (Pf) vectors, the principal vectors of malaria incidence. Before that, also due to flood during 2000, altogether 16 blocks were affected. It can be noted that the percentages of Pf have been consistently high from 2003-04 in comparison with the State as a whole. The climatic and topographic factors are to some extent responsible for the resurgence of incidence. Maximum rainfall usually occurs between June and September. Maximum temperature used to be recorded in June. Usually from June to September the maximum numbers of malaria cases are detected.

The public health department has been spraying DDT to contain the incidence of malaria, although the coverage of DDT spraying is not satisfactory in the district. DDT (50 percent) is to be sprayed in those areas where any death due to Pf malaria would be reported. From May 2007 to October 2007, DDT has been sprayed in 5 endemic blocks which cover more than 2.75 Lakh population besides supply of other drugs and injectables for malaria affected persons. Also, Radical Treatment has been introduced against all malaria positive and fever cases. In addition to the aforesaid activities, mosquito net has been distributed by the Health Department to 20,000 below poverty line households in the affected blocks of the district and will be distributed to all the below poverty line households very soon. Some NGOs have also taken initiative to distribute mosquito net in different blocks.

Figure 3.4 Prevalence of Malaria in blocks of Birbhum, 2003-07



Note: High intensity: Incidence of malaria found during any 3 or more years in the specified period.
 Moderate intensity: Incidence of malaria found during any 2 years in the specified period.
 Low intensity: Incidence of malaria found during any 1 year in the specified period.

Tuberculosis

Tuberculosis has been a major public health problem not only in Birbhum district or West Bengal but also in different parts of India. Latest estimates show that in India, about 40 per cent of the population is infected with the *tuberculosis bacillus* (Ministry of Health & Family Welfare, Government of India, 2004). Annual new smear positive case detection in Birbhum district is somewhat higher than the average figure for the whole state in the recent years. To control the recurrence of the disease, six Tuberculosis Units (TUs) have been set up in the district, each Unit covering approximately 5.4 lakh population (Table 3.6). The population load per TU varies substantially across blocks mainly due to the variation in the population density. The TUs of Murarai and Bolpur serve much higher population compared to other TUs.

Table 3.6: Population load in each Tuberculosis Unit in Birbhum

TB Unit	Block/Municipality covered	Population covered in 2006 (Projected)
Suri	Suri-I, Suri Municipality, Suri-II, Md. Bazar, Rajnagar	484222
Sainthia	Sainthia, Labpur, Mayureshwar-II	542323
Bolpur	Bolpur-Sriniketan, Bolpur Municipality, Illambazar, Nanoor	633065
Rampurhat	Mayureshwar-I, Rampurhat-I, Rampurhat-II, Rampurhat Municipality	550971
Murarai	Murarai-I & II, Nalhati-I & II	716048
Niramoy	Dubrajpur, Khayrasole	350282
Total		3275473

Source: Office of the DTO, Birbhum

Revised National Tuberculosis Control Programme (RNTPC) started in the district in April, 2001. The primary objective of RNTPC was to emphasize the cure of infectious cases through administration of Directly Observed Treatment Short Course (DOTS) to achieve a cure rate of above 85 percent and sputum microscopy is the diagnostic criteria in RNTPC. At present there are 28 Microscopy Centres situated in all the BPHCs and some PHCs and 484 DOT Centres covering all the *Gram Panchayats* and Municipalities.

Both annual case detection rate and suspected incidence rate are higher in the population covered

by Sainthia, Niramoy and Suri TUs compared to other TUs during the last two years (Table 3.7). But in absolute number, the number of cases is the highest in the Murarai TU. It can also be observed that the proportion of suspected tuberculosis cases where patients are subsequently diagnosed as positive and registered under DOTS are higher in Suri, Bolpur and Niramoy TUs compared to the other TUs.

Table 3.7: Performance of Revised National Tuberculosis Control Programme in Birbhum

TB Units	2006			2007		
	Suspected incidence rate/1000 population	Percent diagnosed positive and registered under DOTS among suspected cases	Cure rate (2005)	Suspected incidence rate/1000 population	Percent diagnosed positive and registered under DOTS among suspected cases	Cure rate (2006)
Suri	6.91	11.33	87.65	6.64	12.07	87.89
Sainthia	7.92	7.82	84.59	6.35	8.81	82.77
Bolpur	6.44	10.28	84.81	5.59	12.22	86.14
Rampurhat	6.89	7.20	86.03	3.62	10.64	84.23
Murarai	6.21	6.90	86.41	5.61	8.62	85.41
Niramoy	7.12	10.91	92.76	6.46	12.81	92.62
Total	6.85	8.85	86.67	6.10	10.67	86.30

Source: Office of the District Tuberculosis Officer (DTO), Birbhum

Birbhum has achieved both the objectives of RNTPC regarding cure rates and case detection rates during the recent years and performed significantly better than West Bengal as a whole (Health on the March, Government of West Bengal, 2005-06). But it is seriously lagging behind many other districts in terms of annual total case detection. The highest cure rate has been observed in Niramoy TU followed by Suri TU.

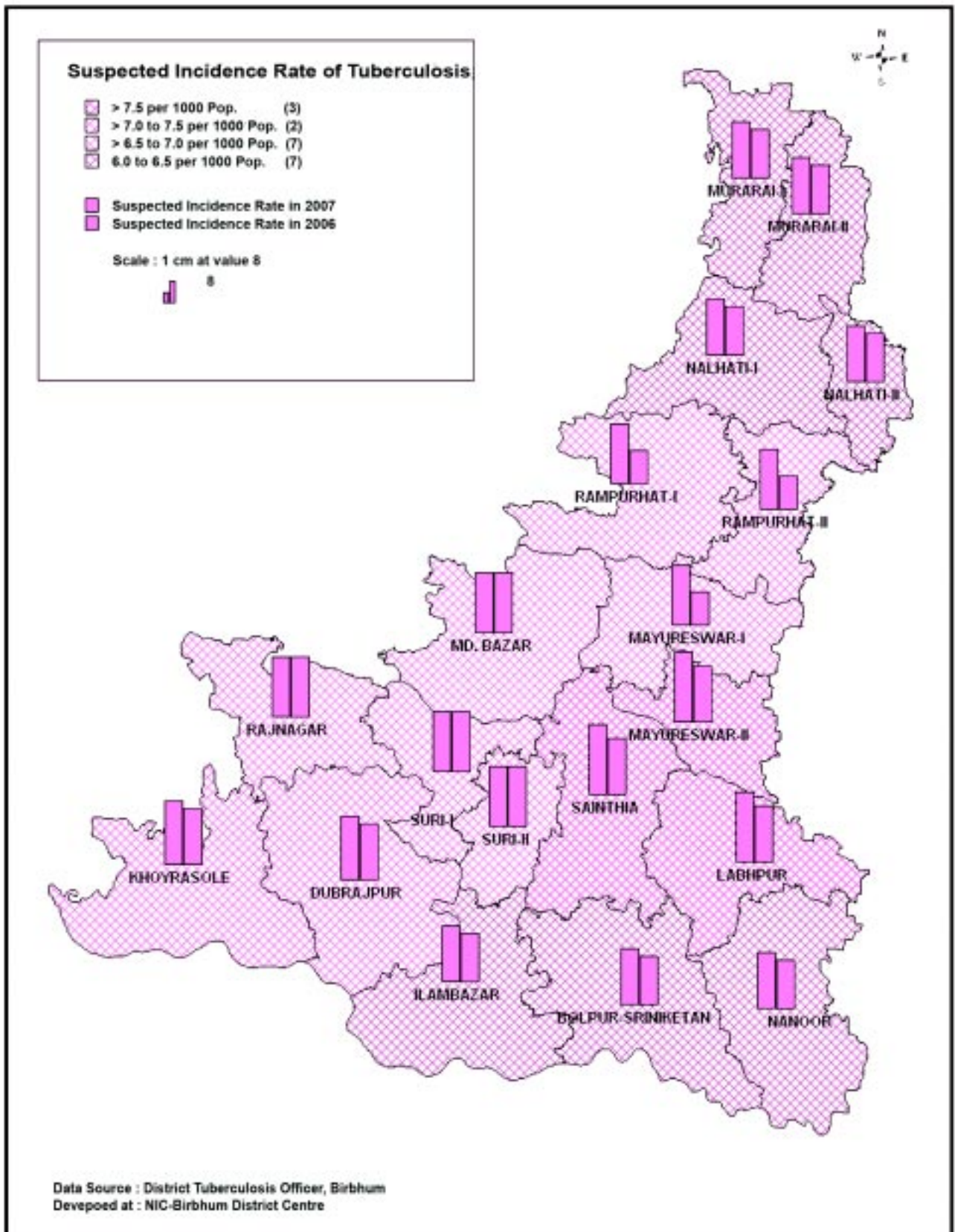
Regarding the age-distribution of smear positive new cases (not shown in the table), it can be observed that in 2006 and 2007, the proportion of cases among women has decreased sharply for the age group of more than 14 years. This possibly indicates the poor nutritional level among the girl children compared to the boys. From the data it can also be argued that the detection of new cases in women may not be taking place properly during the adult ages. This is possibly due to women's self-abrogating nature as far as the physical ailments are concerned and social taboo and misconception

regarding the illness. Local NGOs and self-help groups at the local level may be helpful in reaching out to the women and educate them about the severity of the disease.

Some of the major constraints of the programme in achieving desired level of success have been identified by the Office of the District Tuberculosis Officer, Birbhum. These are - lack of training, improper history taking and lack of motivation among some of the Medical Officers in charge of Tuberculosis (MOTCs), other Medical Officers (MOs) and Multi Purpose Health Workers (MPHWs). It has also been pointed out that some of the microscopes do not work properly and cannot be used for case detection. Chemo Prophylaxis is also not being practiced.

To overcome these barriers some steps have been taken by the District Tuberculosis Officer, Birbhum. The district authority has requested MOs for proper counseling at the time of diagnosis and informed the health workers to make home visits at least for all positive patients. Besides, follow-up examination within one week of the last dose to achieve maximum cure rate, the provision for sputum collector in all health facilities and initial mandatory home visits by health workers will help to reduce defaulter in future have also been initiated. Various sensitization programmes and IEC activities have been conducted about the issue.

Figure 3.5 Incidence of Tuberculosis in blocks of Birbhumi, District Tuberculosis Cell, 2006-07



Leprosy

India accounts for more than 60 per cent of total global recorded cases of leprosy. The states with high prevalence rates are Uttar Pradesh, Bihar, Orissa and West Bengal (National Leprosy Elimination Programme Status Report, 2000). Since there is no effective primary prevention, early detection, regular and adequate treatment with Multi Drug Therapy (MDT) and follow-up surveillance are essential for eradication of the disease.

Like other communicable diseases, leprosy has been one of the major public health problems in the district for a long time. After the introduction of MDT during last twenty years enormous progress has been achieved in combating the disease. It has been observed that the New Case Detection Rate (NCDR) as well as Prevalence Rate (PR) per 10,000 population have been consistently declining over the period, though both the rates are still higher in the district compared to the State as a whole. The proportion of women among the new cases varied between 25-30 percent and that of children between 8-10 percent during the past few years, which are somewhat lower than the average figures of the State. But it should be noted that the percentages of *Multi Bacillum* (MB) cases, which are more complicated and serious than *Pauci Bacillum* (PB) cases, are significantly higher in Birbhum district compared to the overall figure of the state.

Analyzing the data for the last three years (given in Table 3.8), it can be ascertained that the concentration of leprosy cases remained consistently higher in the blocks of Western zone of the district, especially in the blocks like Khayrasole, Dubrajpur, Rajnagar and Md. Bazar (more than 2 per 10,000 population during 2006-07). A sharp decline in the prevalence rate can be noticed in Mayureswar-I, Rampurhat-I, Suri-I and II during the past three years. Though the data for the municipal areas are not available for all the three years, it can be pointed out that the prevalence rates were very high in Rampurhat, Dubrajpur and Suri Municipalities, but in the last of the three it declined steadily over the years.

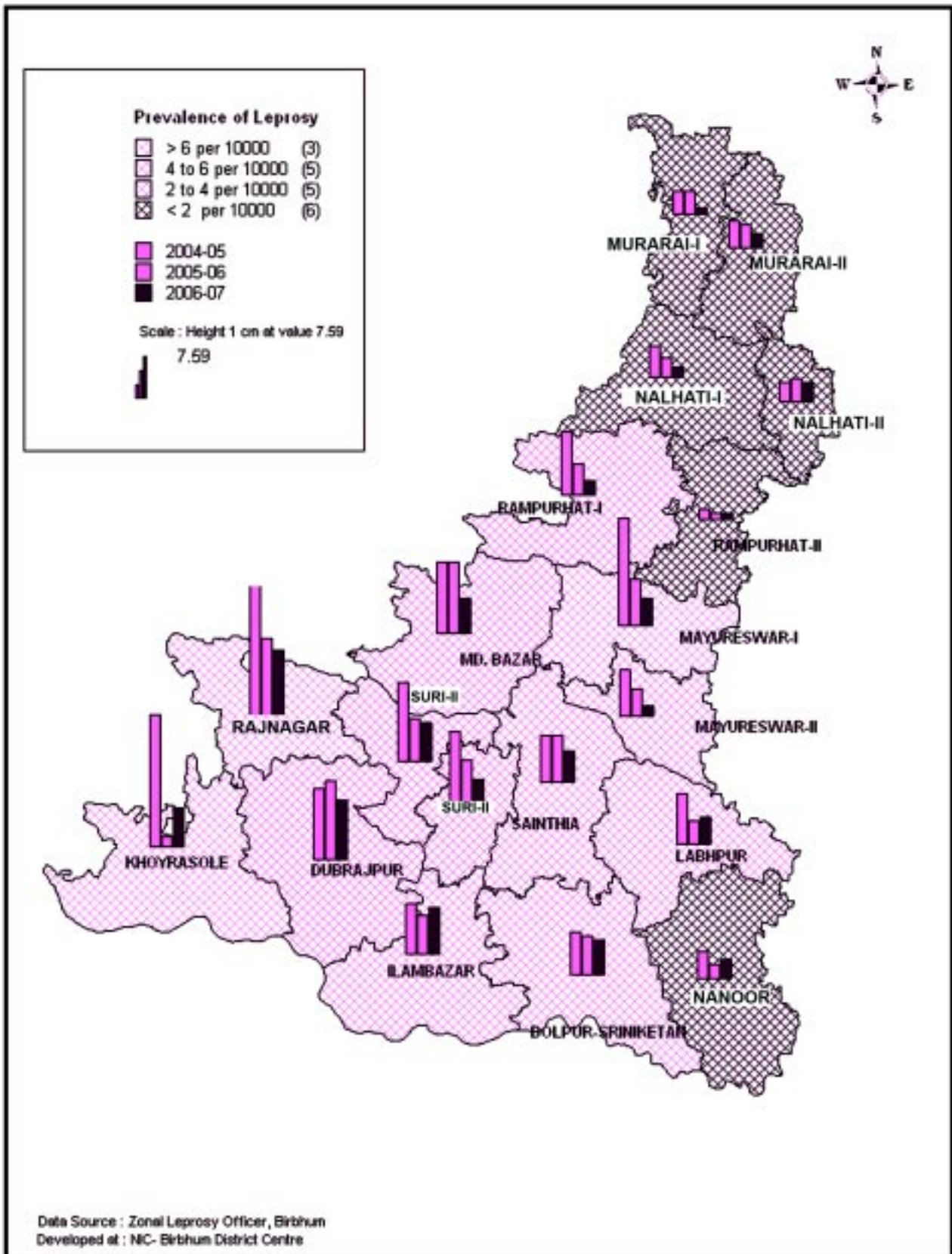
Table 3.8: Prevalence of leprosy by blocks/municipalities in Birbhum

Blocks/ Municipality	2004-05			2005-06			2006-07		
	Total no. of reported cases	Prevalence rate/10,000 population	Percentage of Multi- Bacillum cases	Total no. of reported cases	Prevalence rate/10,000 population	Percentage of Multi- Bacillum cases	Total no. of reported cases	Prevalence rate/10,000 population	Percentage of Multi- Bacillum cases
Bolpur- Sriniketan	46	2.40	73.91	42	2.19	90.48	38	1.98	71.05
Rampurhat-II	12	0.68	91.67	7	0.39	71.43	9	0.51	100.00
Suri-I	48	4.57	58.33	25	2.38	84.00	23	2.19	82.61
Rampurhat-I	62	3.59	70.97	30	1.74	73.33	16	0.93	87.50
Dubrajpur	71	4.03	83.10	79	4.48	67.09	60	3.40	80.00
Illambazar	46	2.93	80.43	34	2.16	82.35	42	2.67	61.90
Labpur	48	2.90	77.08	22	1.33	81.82	25	1.51	84.00
Nalhati-II	12	1.10	100.00	15	1.38	73.33	11	1.01	90.91
Md. Bazar	62	3.99	82.26	64	4.12	76.56	31	2.00	87.10
Mayureswar-I	92	6.08	71.74	40	2.64	77.50	23	1.52	73.91
Murarai-I	25	1.40	80.00	25	1.40	88.00	9	0.50	100.00
Nalhati-I	36	1.86	77.78	23	1.19	73.91	15	0.77	93.33
Nanoor	32	1.56	65.63	17	0.83	64.71	21	1.03	90.48
Khayrasole	110	7.34	68.18	9	0.60	77.78	35	2.33	57.14
Murarai-II	30	1.48	66.67	26	1.28	76.92	19	0.94	89.47
Rajnagar	58	7.59	65.52	31	4.06	77.42	25	3.27	84.00
Sainthia	50	2.63	66.00	51	2.68	64.71	32	1.68	46.88
Suri-II	38	4.45	65.79	24	2.81	62.50	16	1.87	93.75
Mayureswar-II	34	2.70	94.12	20	1.59	75.00	7	0.56	85.71
Suri(M)	36	6.48	91.30	37	5.21	78.38	23	3.24	86.96
Rampurhat (M)	NA			28	4.01	53.57	31	4.44	19.35
Sainthia (M)	NA						3	0.71	66.67
Dubrajpur (M)	NA						12	3.37	33.33
Bolpur (M)	NA			28	2.83	53.57	29	2.93	44.83
Nalhati (M)	NA						0		
Total	958	2.88	74.43	677	2.04	73.71	555	1.67	71.89

Source: Office of the Zonal Leprosy Officer, Birbhum

The results of Block Leprosy Awareness Campaign (BLAC), which was implemented during 2004-05, were very encouraging. The Campaign included special efforts to improve quality of services in the endemic pockets and also to increase public awareness about leprosy and skill of the general healthcare staff. BLAC-IV (4th version of BLAC) was conducted in five blocks and three Municipalities in Birbhum where the prevalence rates were more than 2 per 10,000 population during the end of 2007 in Suri-I, Khayrasole, Illambazar, Rajnagar and Dubrajpur blocks and Suri, Rampurhat and Dubrajpur municipalities. Besides household contact with family members in the villages, different IEC activities were also conducted.

Figure 3.6: Prevalence of Leprosy in blocks of Birbhumi, 2004-07



Filaria

Filariasis is a major public health problem in India and in spite of existence of National Filaria Control Programme (NFPCP) since 1955, currently there may be up to 23 million cases of symptomatic filariasis (Agarwal and Sashindran, 2006). West Bengal is among those seven states in India, which contribute over 86 percent of micro-filariasis carriers and 97 percent of disease cases in the country. Three districts, namely, Birbhum, Bankura and Malda are responsible for the majority of cases in West Bengal.

Two NFPCP Units are located in Birbhum district at Suri and Bolpur Municipalities covering the Suri sub-division and partly Bolpur sub-division out of 9 Units in the State. Therefore, the data on prevalence of filaria in the rural areas separately are not available as such. From the available data, it can be ascertained that though both the microfilaria rate (number of persons having micro-filaria per 1,000 population) and disease rate (number of persons having disease manifestation per 1,000 population) in the district have been consistently declining over the years (Table 3.9), both the rates have been found to be the highest in the Suri NFPCP Unit followed by the Bolpur NFPCP Unit among all the NFPCP Units of the state. Data from the Health Department suggest that four blocks, namely, Rajnagar, Md. Bazar, Dubrajpur and Bolpur-Sriniketan contributed majority of the cases in the district.

Table 3.9: Micro-filaria Rate in different reporting units in Birbhum and in West Bengal

Reporting Units	2001	2002	2003	2004	2005	2006
Suri	11.46	9.83	6.92	4.27	3.2	4.85
Bolpur	0.0	1.13	1.11	0.97	0.0	0.74
West Bengal	3.50	3.92	3.52	3.21	3.78	2.84

Source: *Health on the March, Govt. of West Bengal for various years*

The new strategy for filariasis elimination aims at transmission control through Mass Drug Administration (MDA) with diethylcarbamazine (DEC) (combination of two drugs) single dose annually (on Filaria Day). In Birbhum, Filaria Day is observed every year and found to be successful to some extent (60 per cent of target has been achieved) in the recent years (Table 3.10).

Table 3.10: Observance of National Filaria Day in Birbhum

Year	Target population	Population covered				Percent covered	Diethylcarbamazine (DEC) Consumed
		2-4 yrs	5-14 yrs	Above 14 yrs	Total		
2004	2025500	125721	290428	806340	1222489	60	2515190
2005	2941700	193066	496258	1319996	2009320	68	2954430

Source: Office of the CMOH, Birbhum

Kala-azar

Kala-azar or Visceral Leishmaniasis (VL) is a deadly protozoal disease caused by parasites of genus *Leishmania Donovanii* which is transmitted to humans by the bite of infected female phlebotomine sand fly. Between 2003 and 2007, a total of 278 cases were detected in the district. Though the incidence of Kala-azar has been lower than the other affected districts of West Bengal, a rising incidence has been observed in 2005 (Table 3.11). As many as 131 cases have been detected in that particular year. In 2006 and 2007, the number of cases declined to 39 and to 30 respectively. Though it only accounts for 5 percent of total cases in West Bengal, the incidence of the disease in the district was substantially higher than the previous years. The incidence of *kala-azar* has been found mainly among the migrating population from neighbouring states of Bihar and Jharkhand. Majority of the cases were reported from the three blocks, namely, Rampurhat-I, Murarai-I and Nalhati-I. In addition to these, Murarai-II, Suri-I, Sainthia, Md. Bazar, Dubrajpur, Mayureshwar-I, Nanoor and Bolpur are also found to be somewhat affected.

Table 3.11: Incidence of Kala-azar in Birbhum and West Bengal

	2003		2004		2005		2006		2007	
	No. of Cases	Dead	No. of Cases	Dead	No. of Cases	Dead	No. of Cases	Dead	No. of Cases	Dead
Birbhum	46	3	30	0	131	0	39	0	30	1
West bengal	1487	8	3015	23	2710	15	1843	10	NA	NA

Source: Office of the CMOH, Birbhum and Health on the March, Govt. of West Bengal for various years

To arrest the incidence of *kala-azar* and its early detection, Health Department of the district has taken some necessary measures, which include special drive for mass collection and examination of blood samples in affected blocks at different points of time and special spray of DDT during 2007 in 6 affected blocks covering 97 per cent of population in those blocks.

Japanese Encephalitis (JE)

Japanese encephalitis (JE) is a viral disease transmitted by mosquito. Children and young adults are most prone to JE virus. The incidence of JE in West Bengal was very high during mid-nineties and several human lives were lost, especially in Burdwan and Birbhum districts during that period. From early period of this century the situation has been under control. But incidence of JE still persists in these two districts at regular intervals (Table 3.12). A little upsurge has also been found in the recent year in Birbhum.

Table 3.12: Incidence of Japanese Encephalitis in Birbhum and West Bengal

	2001		2002		2003		2004		2005	
	No. of Cases	Dead	No. of Cases	Dead	No. of Cases	Dead	No. of Cases	Dead	No. of Cases	Dead
Birbhum	0	0	0	0	0	0	12	1	23	1
West Bengal	119	21	301	105	2	1	64	12	72	7

3.5 Urban Health: DFID assisted Honorary Health Worker (HHW) Scheme

DFID assisted HHW scheme is a significant step in meeting the health care needs of the urban poor in West Bengal. It was implemented in 2004 in 11 Municipalities of 8 districts in the State with the objective of enhancing the quality of health care services among the urban poor by honorary health workers from the same community. In Birbhum, the scheme has been implemented in two municipalities – Suri and Bolpur. HHW is the first contact point for delivery of primary and referral health care services to the below poverty line families at their doorstep. It aims at integrating the urban health services with the general health services rendered by the district and sub-divisional hospitals. HHW visits every house in her locality twice a month under the guidance of the supervisor. Besides collecting data on health related issues, HHW also creates awareness about RCH, vector borne diseases, cleanliness of household and environment, malnutrition, physiological problems during adolescent period, involvement of male in family matters etc. In addition, seeking treatment in time in case of any disease is also encouraged.

There are three tiers in the implementation of the scheme. In the first tier, i.e. at the community level, one community health worker serves 1,000 population or one urban block. In the second tier, one Sub-Health Post (SHP) is created for 5,000 population or 5 blocks. At the highest tier, one Health Post (HP) is created in each Municipality to serve all the below poverty line families residing in the Municipal areas. Although the success of the programme can not be ascertained within this short period of time since beginning of implementation, it can be said that the maternal and child health indicators are somewhat better among the urban poor in the two municipalities. Table 3.13 presents a selected number of indicators for the two municipalities.

Table 3.13: State of Health Care of Poor Households in DFID assisted Honorary Health Worker (HWW) Scheme in Bolpur and Suri Municipalities, 2006-07

	Name of Municipalities	
	Bolpur	Suri
Number of Population covered	13841	14737
Number of Families covered	2819	3028
Status of maternal health		
Total ANC registered	203	258
Percentage registered within 12 weeks	46.8	34.5
Percentage had at least 3 ANC Check-ups	35.5	59.3
Percentage received two doses of TT	81.3	70.5
Percentage given prophylaxis for Anemia	21.7	61.6
Total Number of Deliveries took place	190	227
Percentage institutional delivery	92.1	78.9
Percentage of mothers aged <20 years	24.2	22.9
Total live-births	190	227
Percentage <2.5 Kilograms babies	15.8	14.5
Percentage received 3 PNC	8.4	22.0
Status of infant and child health		
Number of infants	225	239
Percentage fully immunized	57.8	64

Percentage given Vitamin A supplementation	63.1	78.2
Number of Under-five children	1105	1185
Percentage had measles during last year	10.9	0.5
Percentage had tuberculosis	0.8	1.8
Percentage had Acute Respiratory Infections (ARI)	19.6	6.7
Percentage had diarrhoea	24.2	20.9
Percentage treated with ORS during diarrhoea	88.8	100

3.6 Water and sanitation

The health indicators of a population are related as much to water and sanitation as to curative care services and mother and child health care services including immunization. The institutional structure of delivery of services in water supply is much more centralized and supply driven than sanitation. The Public Health Engineering Department is the implementing agency of water supply schemes. The fund for capital investment and operation and maintenance comes from two different sources. One is through Accelerated Rural Water Supply Programme (ARWSP), which is central assistance to the state. The other is the matching contribution of the state government through Minimum Needs Programme (MNP). The state government also provides non-plan fund for operation and maintenance.

The coverage of rural water supply in West Bengal is quite high; 86 per cent of the population and 78 per cent of the habitations are fully covered³ by rural water supply. In Birbhum, they are substantially higher than the state average. 96.7 per cent of habitations and 97.2 per cent of population are covered by water supply.

³ For definitions of Fully Covered (FC), Partially Covered (PC) and Not Covered (NC) as per the Ministry of Rural Development, Government of India, see Appendix to this chapter.

Table 3.14: Extent of coverage of habitations with drinking water facility, 2003

Block Name	Habitations not covered (No.)	Partially covered (No.)
Murarai – I	5	26
Murarai – II	6	29
Nalhati – I	6	14
Nalhati – II	8	21
Rampurhat – I	1	10
Rampurhat – II	3	19
Mayureswar – I	7	10
Mayureswar – II	10	38
Md. Bazar	8	17
Rajnagar	10	8
Suri – I	18	27
Suri – II	5	13
Sainthia	7	13
Labpur	4	41
Nanoor	1	17
Bolpur Sriniketan	3	2
Illambazar	5	19
Dubrajpur	44	126
Khoyrasole	27	88
Total	178	538

Source: Office of the Executive Engineer, Public Health Engineering Directorate (Civil), Birbhum (As per Habitation Survey 2003)

Table 3.14 presents the distribution of habitations not covered by safe drinking water facility. There are 178 habitations which are yet to be covered and exactly half of them are in three blocks, viz. Dubrajpur, Khoyrasole and Suri-I. Dubrajpur seems to be the worst block in terms of water facility – both the number of habitations not covered (44) and the number of habitations partially covered (126) are much above the numbers in other blocks. Rural piped water supply has covered around 32 per cent of the rural population of the state as on March 2006. But in Birbhum, the coverage is only 18 per cent (Table 3.15).

Table 3.15: Coverage of Rural Piped Water Supply Scheme in Birbhum, 2006

Program	No. of piped water supply scheme	Villages covered	Habitations covered	Population covered (as per 2001 Census)
ARWSP	17	113	254	2,94,081
MNP	15	93	172	2,27,708
PMGY	2	11	51	20,975
Total	34	217	477	5,42,764

Source: Office of the Executive Engineer, Public Health Engineering Directorate (Civil), Birbhum

The progress of Total Sanitation Campaign (TSC) has been quite diverse within the districts of West Bengal. Till September 2007, around two lakh household latrines have been constructed. Birbhum is among the few districts where progress in latrine construction has been slow. In West Bengal the progress of TSC has been on average higher among the BPL households than among the APL households. In Birbhum around 62 per cent of the latrines constructed are in BPL households. TSC is a demand driven programme where beneficiaries themselves have to contribute. The APL beneficiaries have to pay full price of toilets, but BPL households get a subsidy of 20 per cent on the cost. 68.5 per cent contribution has been made by the households themselves and the rest by the central and state governments. The beneficiaries' share in total expenditure varies across blocks – from 60 to 81 (Table 3.16). It has been observed that the performance of TSC in terms of physical achievement correlate positively with literacy and negatively with proportion of BPL households in the district.

Table 3.16: Progress in Total Sanitation Campaign in Birbhum till 2006

	Number of latrines			% BPL	Expenditure (in Rs lakh)			Beneficiary Share
	Approved	Constructed	% Achieved		Central	State	Beneficiary	
Bolpur-Sriniketan	30742	14599	47.5	52.6	13.9	4.4	50.1	73.2
Dubrajpur	31837	10455	32.8	41.8	8.0	2.5	38.3	78.5
Illambazar	25163	29684	118.0	63.6	33.0	8.8	90.9	68.5
Khoyrasol	26246	6983	26.6	49.8	6.3	2.5	25.0	74.0
Labpur	34675	14437	41.6	56.5	14.8	4.3	49.9	72.3
Mayureswar-I	28978	11301	39.0	74.0	15.2	4.6	33.9	63.1
Mayureswar-II	21133	8241	39.0	73.1	11.1	4.0	26.7	63.9
Md Bazar	27364	8775	32.1	61.0	9.8	3.0	29.4	69.7
Murarai-I	28448	6853	24.1	41.8	5.2	1.5	25.9	79.4
Murarai-II	31133	7352	23.6	71.5	9.3	4.2	20.5	60.3
Nalhati-I	34614	6219	18.0	80.1	9.5	2.6	17.6	59.3
Nalhati-II	19496	7611	39.0	38.3	5.4	1.7	30.1	80.9
Nanoor	36297	15268	42.1	69.1	19.3	5.7	46.6	65.1
Rajnagar	14543	7214	49.6	64.3	8.5	2.6	23.4	67.8

Rampurhat-I	30318	8252	27.2	63.0	9.4	2.7	26.5	68.7
Rampurhat-II	31336	14040	44.8	79.3	21.1	6.4	41.2	60.0
Sainthia	33933	9858	29.1	74.6	15.4	4.7	30.0	59.9
Suri-I	16797	6651	39.6	55.5	6.7	2.7	23.2	71.2
Suri-II	14416	6117	42.4	55.5	6.2	1.9	21.3	72.4
Total	517469	199910	38.6	62.2	228.4	70.8	650.7	68.5

Source: Zilla Parishad, Birbhum

3.7 Concluding Remarks

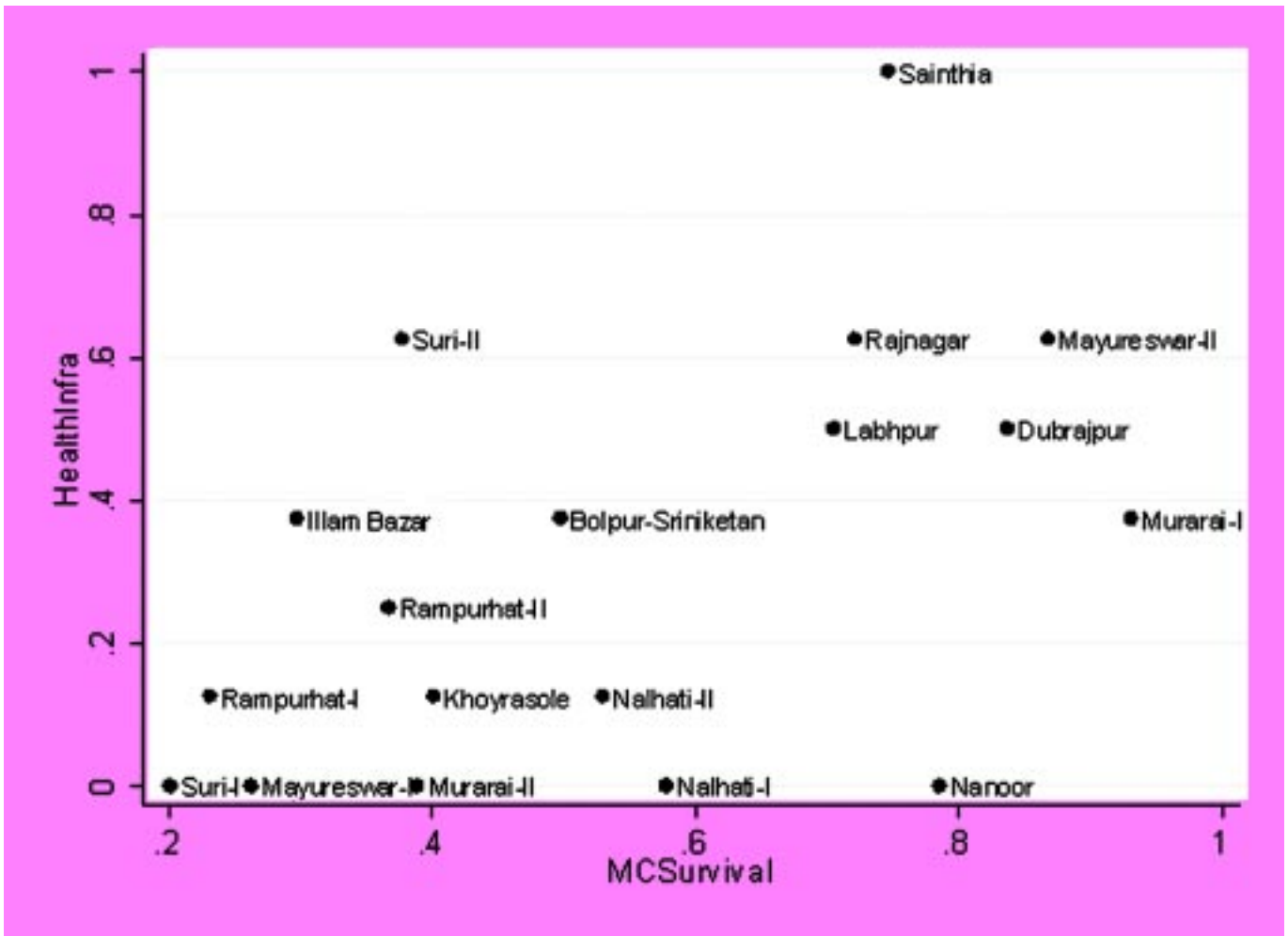
The state of healthcare infrastructure and provisioning, performance of various tiers of hospitals, maternal and child health, endemicity of diseases and state of water and sanitation in the district etc. have been dealt with in a great detail in the present chapter. It has been found in the analysis that there is a substantial gap between demand and supply of healthcare infrastructure, both physical and manpower, especially among the blocks of Rampurhat sub-division. Though the percentage of institutional deliveries has been increasing during the recent years, other aspects of maternal health such as provisioning of ante-natal care, post-natal care have to be improved and require special attention from the Health Department of the district. Due to paucity of time-series data, the trend of infant death per 1,000 live-births could not be established, the present trend of other child health indicators such as incidence of low birth weight, achievement of complete immunization etc. suggest that there has not been much improvement on infant and child health in the recent years. Special effort from Health Department is needed to improve maternal and child health indicators in the district. Though the prevalence of communicable diseases has been declining consistently during the recent years, the data suggest that prevalence of some of the communicable diseases such as leprosy, tuberculosis, filaria and malaria are still significantly high. Coverage of drinking water and sanitation facility has to be improved as the present analysis implies.

To observe whether there is a relationship between infrastructural input and health outcome among blocks, two indices – one for infrastructural input and another for health outcome have been constructed. The input variables consist of doctor-population ratio and bed-population ratio on the one hand and percentage of institutional deliveries and number of infant deaths per 1,000 live-births as output variables, on the other. Then the blocks are ranked in descending order. The result shows (Table 3.17 and Figure 3.7) that with some variations, there is a link between input of infrastructure and outcome (Spearman Rank Correlation Coefficient: 0.49, significant at 5% level of significance).

Table 3.17: Ranks of blocks with respect to the input and output indicators

Blocks	Index of Health Infrastructure	Ranking	Blocks	Index of Maternal and Child Survival	Ranking
Sainthia	1.00	1	Murarai-I	0.93	1
Mayureswar-II	0.63	2	Mayureswar-II	0.86	2
Rajnagar	0.63	3	Dubrajpur	0.83	3
Suri-II	0.63	4	Nanoor	0.78	4
Dubrajpur	0.50	5	Sainthia	0.74	5
Labhpur	0.50	6	Rajnagar	0.72	6
Murarai-I	0.38	7	Labpur	0.70	7
Md. Bazar	0.38	8	District	0.64	Dist. Average
Bolpur-Sriniketan	0.38	9	Nalhati-I	0.57	8
Illambazar	0.38	10	Nalhati-II	0.52	9
Rampurhat-II	0.25	11	Bolpur	0.49	10
Nalhati-II	0.13	12	Khoyrasole	0.40	11
Rampurhat-I	0.13	13	Murarai-II	0.38	12
Khoyrasole	0.13	14	Suri-II	0.37	13
District	0.13	Dist Average	Rampurhat-II	0.36	14
Nalhati-I	0.00	15	Md. Bazar	0.35	15
Murarai-II	0.00	16	Illambazar	0.29	16
Mayureswar-I	0.00	17	Mayureswar-I	0.26	17
Suri-I	0.00	18	Rampurhat-I	0.23	18
Nanoor	0.00	19	Suri-I	0.19	19

Figure 3.7: Scatter diagram showing the relation between index of health infrastructure and index of maternal and child survival



Appendix

The criteria for identifying habitations as Not Covered (NC), Partially Covered (PC), and Fully Covered (FC) by the source of drinking water

Not Covered

A habitation which fulfills the following criteria may be categorised as a Not Covered (NC) / No Safe Source (NSS) habitation:

- i) The drinking water source/point does not exist within 1.6 km of the habitations in plains or 100 meter elevation in hilly areas. The source/point may either be public or private in nature. However, habitations drawing drinking water from a private source may be deemed as covered only when the water is safe, of adequate capacity and, is accessible to all.

- ii) Habitations which have a water source but are affected with quality problems such as excess salinity, iron, fluoride, arsenic or other toxic elements or biologically contaminated.
- iii) Habitation where the quantum of availability of safe water from any source is not enough to meet drinking and cooking needs.

Partially Covered

Habitations which have a safe drinking water source/point (either private or public) within 1.6 km. in plains and 100 meters in hill areas but the capacity of the system ranges between 10 liters per capita per day (lpcd) to 40 lpcd.

Fully covered

All the remaining habitations may be categorised as Fully Covered (FC). That is, a habitation is categorised as Fully Covered if there is a drinking water source/point (either private or public) within 1.6 km. in plains and 100 meters in hill areas, and availability of water is 40 lpcd or more.

