SCARCITY OF MEDICAL FACILITIES AMONG TRIBAL PEOPLE IN SUNDARBAN

Dr. Manasi Das

Abstract

Health is a fundamental human right and central to the concept of quality of life. Due to various socio-economic and political factors, there exists a widespread inequality in the distribution of health care facilities in India. The present study attempts to highlight on the existing health care infrastructure and also tries to analyse the inter-block disparities regarding health care facilities in Sundarban which is known as one of the backward region of West Bengal. To identify the regional pattern of health care infrastructure three broad categories have been identified i.e. availability of health care infrastructure, performance of public health care centres and accessibility to health care infrastructure. There is a huge shortfall in the existing number of primary health centres and manpower under the public health system in Sundarban. Nearly 70% areas of Sundarban sufferfrom very poor health care infrastructure. Only six blocks viz. Canning-I, Kakdwip, Jaynagar-I, Patharpratima, Mathurapur-I and Mathurpur-II have relatively better health care facilities than rest of Sundarban. The state Government needs to adopt viable policies and programmes and take some immediate actions to improve the health care infrastructure in Sundarban.

Keywords- Ethno-Medicine ,Santal, Traditional Medicine, Religious Practice

Nobody would deny that a healthy community is the mortarfor building an economically viable society. Sound health is the precondition for human development process to roll on smoothly, irrespective of caste, religion and region. Health is not just the absence of disease. It represents both physical and mental capability to enjoy living. Health care is a social determinant as it influenced by social policies. One of the basic objectives of eleventh five year plan is to achieve good health for people, especially the poor and the unprivileged. In view of this, the department of Health and Family Welfare has focussed its attention on improving the primary health services by channelizing adequate financial and manpower resources for making the health services more accessible and affordable to the poor people. In fact, after independence of the country, the health infrastructure of Sundarban has expanded manifold, still the physical health infrastructures are inadequate to extend quality health services to all the people.

Health is an integral part of development. The health care as a constitutive element of well-being and yet it has been one of the most neglected aspects of development in India1 . Just as health status is influenced by the socio-economic factors, similarly health services are shaped by the socioeconomic and political factors of any region 2 . Inequality in the distribution of health care facility is a common manifestation of these factors and a general feature of health care system in India. According to Rajeshwari and Sinha 3 , the distribution of health care institutions in India is guided by locational preferences. Public health is nothing but, the practice of preventing disease and promoting good health within groups of people, from small communities to entire countries4 . In this context, an attempt is made to examine the spatial distribution of health care infrastructure in Sundarban. It is not surprising that there is a tremendous pressure on existing health care system to meet the need of vast population. Hence an assessment of available resources is imperative for proper allocation and efficient utilization of health care services.

Study area:

Sundarban is the southernmost part of West Bengal. It is bounded by the river Hooghly on the west, the Bay of Bengal on the south, Ichamati-Kalindi-Raimangal rivers on the east and the Dampler-Hodges line on the north. In this Ganga Plain delta building process is still very active. This active delta has a network of tidal channels, river creeks and numerous islands. The climate of the area is characterised by an oppressive hot summer, high humidity all through the year and well distributed rainfall during the monsoon season. Figure1 represents location of the study area. The total land area measures about 9629 sq.km, of which, nearly 48% area is inhabited whereas the rest is reserved forest. In 2011 the total recorded population in this region was 44262595 . The mainstay of economy is agriculture, primarily Paddy cultivation. The region is characterised by developmental constraints in terms of rapidly growing population, lack of appropriate transportation, modern energy services, adequate health care delivery and education.
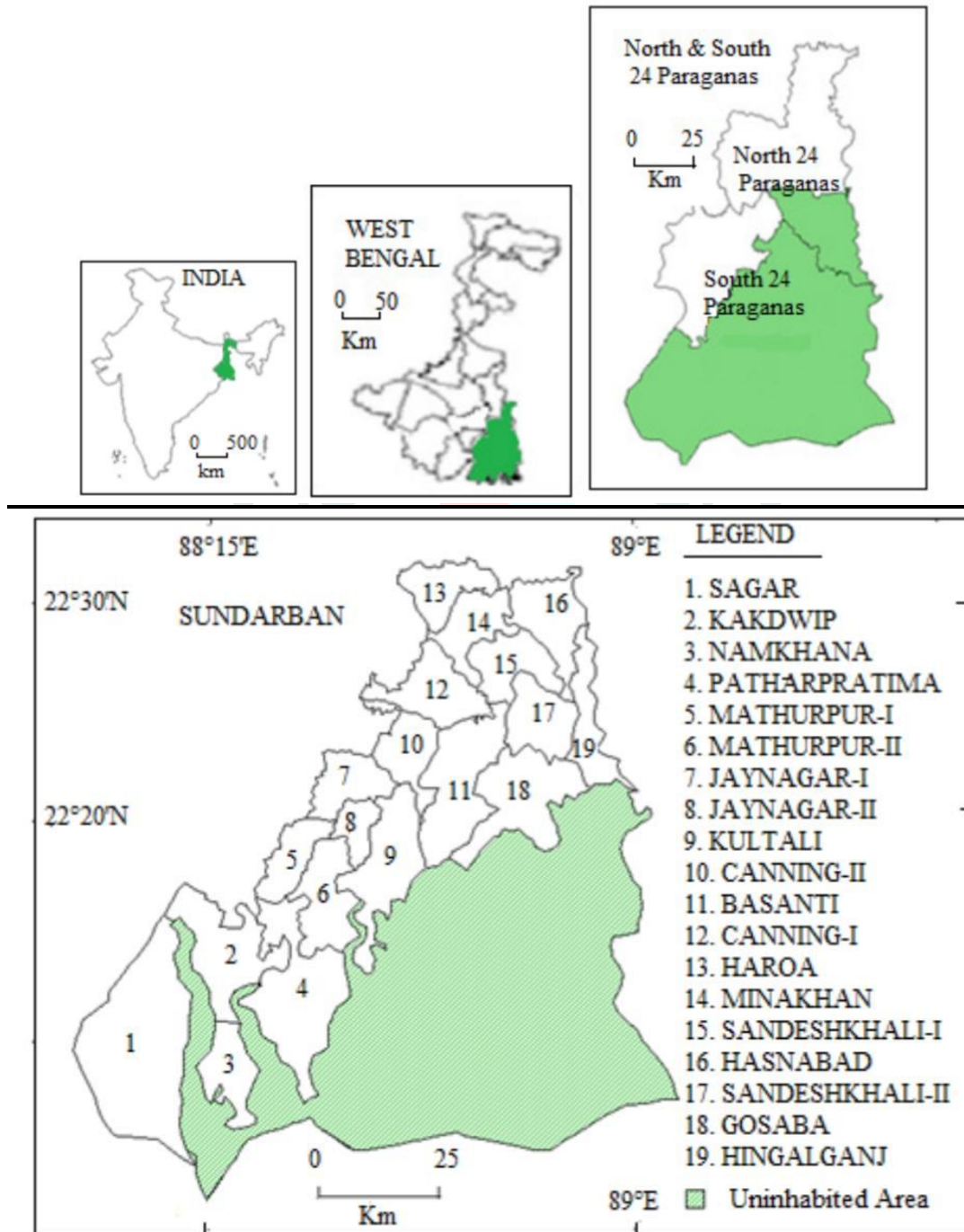
Location Map of Sundarban

Infrastructure can be measured either in terms of investment towards a particular service or in terms of physical quantity of the services available to the end users. In the present study twelve indicators of physical infrastructure services have considered to construct the Healthcare Infrastructure Index for Sundarban. Table 1 shows the selected indicators of health care infrastructure. These are grouped in following three categories under different heads: i. Availability of health care facilities. ii. Performances of public health care centres. iii. Accessibility to health care facilities

Availability of health care infrastructure	x^1	Doctor-population Ratio
	x^2	Population served per Primary Health Centre (PHC)
	x^3	Population served per sub-centre
	x^4	Number of Medical institutions per 1,00,000 population
	x^5	Number of beds per 10,000 population
Performances of public health care centres	x^6	Percentage of indoor patients to total indoor patients of Sundarban
	x^7	Percentage of outdoor patients to total outdoor patients of Sundarban
	x^8	Percentage of immunization to total immunization of Sundarban
	x^9	Percentage of institutional delivery to total institutional delivery of Sundarban.
Accessibility to Health care infrastructure	x^{10}	Number of Medical institutions per 100 sq. km.
	x^{11}	Number of sub-centres per 100 square kilometres.
	x^{12}	Percentage of villages with nearest PHC within 5 km (If not available within the village)

Indicators of Health care Infrastructure of Sundarban

In the present work community development blocks have been taken as the unit of the study. The detailed methodology for preparing Healthcare Infrastructure Index (HII) runs as follow:

$$I_{ij} = \frac{X_{ij} - \min_{j} X_{ij}}{\max_{j} X_{ij} - \min_{j} X_{ij}}$$

Iij is the infrastructure indicator for the jth block with respect to i th variable and Xij represents the value of the ith infrastructural development indicator in jth block, minj Xij and maxj Xij are the minimum and maximum values of X respectively. However, if Xij is negatively associated with the status of infrastructural development, former equation can be written as:

$$I_{ij} = \frac{\max_{j} X_{ij} - X_{ij}}{\max_{j} X_{ij} - \min_{j} X_{ij}}$$

To identify the overall development regarding health care infrastructure, Healthcare Infrastructure Index (HII) have been computed. This is done by taking a simple average of the chosen indicators. It may be algebraically expressed as:

$$HII_j = \frac{\sum\limits_{i=1}^{n} I_{ij}}{N}$$

Where, N represents total number of selected indicators for healthcare infrastructure and HII_j denotes the health care infrastructure Index for jth block. The high values of HII_j indicate high level of development and vice versa.

Health infrastructure is the resources needed to deliver the essential public services to the people. Sound health infrastructure ensures efficient and effective utilization of essential public health services. The totality of the public health infrastructure includes all governmental and non-governmental entities that provide public health services to the people.

Availability of health care facilities: The doctor-population ratio is perhaps the most important factor affecting the health care facility in an area. Sundarban is lagging behind far in terms of availability of doctors and also there is huge variation in population served per doctor. In 2010-11, population served per doctor in Kakdwip was 7621 while for Harora it was 53600. Table 4 depicts the overall scenario regarding doctor-population ratio in the study area which is frustrating enough.

Since independence India adopted the process of planning all round development of the country including raising the standard of living of the people. In such programmes one of the programmes was that of establishment of Primary Health Centres with three sub-centres and four to six beds per Primary Health Centre in community development block6 . Primary Health Centres (PHCs) are the most important peripheral health service institutions. Unfortunately, not a single block has been found where less than 30,000 persons are served by one PHC. In contrast, there are four blocks namely, Canning-I and II, Kakdwip and Jaynagar-I where population served per PHC is more than four times than the existing norm. Out of nineteen blocks there are seventeen blocks where the average number of people served by one PHC is more than 50,000 Table 2 reflects very poor condition of the supply side of health care system in the Sundarban.

Size of population served per PHC	Name of the Blocks
30,000 or less	
30,000- 50,000	Hinjaiganj,Namkhana
50,000-70,000	Hasanabad, Sandeshkhali-I, Kultali
70,000-90,000	Harora, Sandeshkhali-II, Basanti, Gosaba, Sagar, Patharpratima, Jaynagar-II, Mathurpur-II
90,000 or more	Mathurpur-I, Canning-I and II, Jaynagar-I,Kakdwip , Minakhan

Population-PHC Ratio in the Blocks of Sundarban

The national norm is one PHC for every 30,000 population in plain areas and for 20,000 population in tribal, hilly and backward areas. Source: Computed from District Statistical Handbook of North and South 24 Paraganas, 2011. In Sandeshkhali-I and II, Gosaba, Namkhana and Mathurpur-II, one sub-centre provides services 4000 to 5000 persons which is much higher than the existing norm of 3000 population. However it is evident from table 3 that there are three blocks which are close to the norm of its provision. The average population served by one sub-centre in Sundarban is 5321.

Size of population served per Sub-centre	Name of the Blocks
5000 or less	Sandeshkhali-I and II, Gosaba, Namkhana and Mathurpur-II
5000-6000	Basanti, Sagar, Patharpratima, Jaynagar-I and II, Mathurpur-I, Canning-I and II, Kakdwip , Minakhan, Hinjaiganj, Kultali
6000-7000	Hasanabad
7000 or more	Harora,

Population-Sub-centre Ratio in the Blocks of Sundarban

The national norm is one sub-centre for every 5000 population in plain areas and for 3000 population in tribal, hilly and backward areas. Source: Computed from District Statistical Handbook of North and South 24 Paraganas, 2011.

 In the present analysis medical institutions include medical colleges, district and sub-divisional hospitals, rural hospitals, PHCs, private medical institutions and those run by NGOs etc. It does not include sub-centres as they provide only minor health care facilities. The availability of medical institutions is measured in terms of number of medical institutions per 1, 00,000 population. It is highest in Mathurpur-II (5.0) followed by kakdwip (3.9). Canning-II is the most poorly served block where 1, 00,000 persons are served by less than one medical institution. Population served per bed is an important indicator of health indicator. Total number of available beds in Sundarban is 1296 (2011). On an average, one bed served 3415 person in a year during 2010 - 11. The availability of beds in medical institutions is measured in terms of beds per 10,000 population. In Sundarban, it is highest in Kakdwip and lowest in Hasanabad. Table 4 highlights that there are twelve block where number of beds serving 10,000 persons is less than just three. So, it is quite evident that regarding population-bed ratio, the circumstances of study area is miserable.

Performance of hospitals, PHCs and sub-centres: To measure the performances of public health care system, we have identified four indicators which are illustrated in Table1. The performance of any health care unit can be denoted by the relative population pressure in the concerned unit. The numerical figures regarding performances of public healthcare centres are expressed in terms of the percentage.

The clinical attendance of patients and the use of medical facilities is another important indicator which reflects the utilization of public health services. The clinical attendance of patients has been analysed in terms of indoor and outdoor patients. In case of the treatment of indoor and outdoor patients, Canning-I and Kakdwip have able to manage a satisfactory position. Both blocks have served more than 32 percentages of indoor patients to total indoor patients of Sundarban. Canning- I have still contributed a good effort to serve the outdoor patients and Jaynagar-II also plays major role in this context. In respect of indoor and outdoor admission of patients Hasanabad stands in lowest position.

Women throughout the world play critical role in economic growth and development and their contribution have an impact on households, communities and national economies7 . Poor health has repercussion not only for women but also their families. Women in poor heath are more likely to give birth to low weight infants. They also are less likely to be able to provide food and adequate care for their children8 . One important indicator of safe motherhood at the district level is the extent of institutional delivery. In respect of institutional delivery Horoa, Kakdwip, Canning-I, Jaynagar-I have achieved a considerable success in recent years. Though, the overall performance of Sundarban is far behind the target of 100% institutional delivery. Moreover, there are substantial variations in the extent of institutional delivery across the blocks. In Sundarban, the block Kakdwip occupies first rank with 13.4% institutional delivery to total institutional delivery of Sundarban, while Hasanabad is in lowest position with only 1.2% institutional delivery to total institutional delivery of the study area.

Immunization programme aims to reduce mortality and morbidity due to vaccine preventable diseases. Since ancient era emphasis has been given to the preventive aspect of health and it is well known that the prevention is better than cure9 . Universal Immunization Programme (UIP) was launched in India 1985 to control diseases like measles, diphtheria, and tetanus and childhood tuberculosis10. The analysis reveals wide differences in level and distribution of childhood immunization within blocks of Sundarban. In immunizing the child, favourable achievement is observed in Canning-I and Basanti block. Other good performing blocks are Canning II, Patharpratima and Hinjalganj found to be worst performing block.

Accessibility of health care infrastructure: The provision of accessibility to health facility can ensure better health condition of the inhabitants. Table 5 reveals that Jaynagar-I ranks first with relatively high number of medical institutions per100 sq.km. Here one medical institution serves 16 sq.km. Canning-I and Mathurpur-II occupy second and third positions respectively where one medical institution serves 20.87 sq.km and 20. 67 sq.km respectively. In all other blocks the number of medical institutions per 100 sq.km is less than four and in Sandeshkhali-II and Canning-II the number is reduced to 1.5 per 100 sq.km and 0.9 per 100 sq.km.

Though sub centres are provide only minor health care facilities but it is very important to the rural poor. Jaynagar-I has higher accessibility to sub-centre as it located here at 2.6 sq.km apart from each other, while 10sq.km is the highest spacing has recorded in Namkhana.

In our country provision for comprehensive health care starts from the PHCs. In case of the accessibility of PHC within 5 km from village, the situation is satisfactory in Minakhan, Sandeshkhali-II, Hinjalganj, Patharpratima and Mathurpur-I where more than 25% villages have greater accessibility to PHCs. The numbers of PHCs have to be increased substantially in Jaynagar-II and Mathurpur-II.

Kendall's coefficient of concordance (W) has been used to determine the degree of association among several parameters (k), of 19 blocks (N) of Sundarban. Value of Kendall's coefficient of concordance (W) is 0.2479. As, N (i.e. number of objects) is larger than 7, value of chi-square (x^2) has been procured to determine the significance of W. Table value of x^2 at 5% level for (N-1= 19-1=18) 18 degrees of freedom is 28.869 but the calculated value of x^2 is 53.546 and this is considerably higher than the table value. Twelve sets of ranking of selected parameters are calculated which is elaborated in table 5. This rejects the null hypothesis that twelve sets of ranking of selected parameters are independent and accepts the alternative hypothesis of significance agreement of twelve sets of ranking.

Overall scenario of health care infrastructure in Sundarban: After a detail analysis of the aforesaid parameters, Health care Infrastructure Index (HII) for each community development blocks have been worked out to perceive the status of health care facilities in different blocks of Sundarban. Table-6 represents the Health care Infrastructure Index (HII) for Sundarban.This would enable us to identify the gaps in infrastructure development in healthcare facilities at the inter block level in Sundarban and also help to make suggestions for appropriate policy interventions for achieving balanced infrastructure development in this area.

There is a wide range of regional variations in levels of health care development among the blocks of Sundarban. So far, Kakdwip with the Composite Index 0.685 is at best position in providing health care services to its common people. It is followed by Canning-I, Jaynagar-I, Mathurpur-II having the rank of 2nd, 3rd and 4th respectively. On the contrary, the conditions of Canning-II, Haroa and Gosaba are very poor in health care services. The situation of Gosaba in health care services is really alarming. Table-7 portrays the overall scenario regarding health care infrastructure of Sundarban.

Sl. No.	Blocks of Sundarban	Health care Infrastructure Index(HII)	Rank
1	Haroa	0.274	18
2	Minakhan	0.401	12
3	Hasnabad	0.319	15
4	Hingalganj	0.289	16
5	Sandeshkhali-I	0.339	14
6	Sandeshkhali-II	0.368	13
7	Canning-I	0.663	2
8	Canning-II	0.278	17
9	Basanti	0.404	11
10	Gosaba	0.271	19
11	Kakdwip	0.685	1
12	Namkhana	0.432	9
13	Sagar	0.460	7
14	Patharpratima	0.521	5
15	Jaynagar-I	0.597	3
16	Jaynagar-II	0.430	10
17	Kultali	0.439	8
18	Mathurapur-I	0.501	6
19	Mathurapur-II	0.588	4

Health care Infrastructure Index (HII) in Sundarban

health care infrastructural development in Sundarban. In this region, two blocks (10.5%) have able to achieve relatively advantageous position and just four blocks (Jaynagar-I, Patharpratima, Mathurapur-I, Mathurapur-II) have performed well in health care infrastructure. Out of nineteen blocks of Sunarban seven blocks (36.8%) reflect low level of heath care infrastructure. The Sundarban is geographically a remote area, criss-crossed by the rivers. Poor transport and communication network, lack of conventional electricity supply and scarcity of potable water are major problem of this region along with natural calamity like cyclones and storm surges. Apart from the indifferent attitude of the government, the above mentioned problems are associated with poor development of health care infrastructure in this region .

Health and nutrition are intimately and intricately connected[12].It must be noted that only institutions do not constitute a compressive health care system but it includes certain other elements, like the system of nutrition, provision of uncontaminated drinking water and healthy living environment[13]. The present study only focuses on the infrastructural facilities of health care system of Sundarban. Nevertheless, this study provides valuable information on recent health care situation of Sundarban.

It focuses on the extreme shortages of health care institutions and manpower in the public health system. As majority of people in Sundarban depend on public health care system, the most important thing is to recruit the required number of doctors and staffs in the public health institutions. Government should open up new teaching hospitals to increase the number of doctors. It may be useful to encourage the non-allopathic system of medicine as large number of people, particularly in rural areas, depends on traditional system of medicine[14]. The ongoing efforts of the government to build up private-public partnership and involve the panchayats more effectively in the participatory management of health services are expected to ensure better health care services.

The Sundarbans, a unique biosphere reserve of mangrove forests and one of the global heritage sites, are located in the extreme south of West Bengal (an eastern Indian state) and Bangladesh, the neighboring country. The entire area is intersected by tidal rivers or estuaries from north and south and by innumerable narrow tidal creeks from east to west painting an assortment of beautiful but largely formidable and inhospitable terrains. The area outside the reserve forest (54 islands), home of about 4 million people spread over 19 administrative blocks, is the human face of the Sundarbans which epitomizes abject poverty, deprivation, and acute struggle against geographical challenges. It is however important to note that the geographical challenges vary across blocks. People, who live in the 'remote' Sundarbans - the blocks adjacent to the forest area or the Bay of Bengal – face much harder problems compared to those who live in the 'peripheries' (and closer to Kolkata).

The major findings related to people's health in the Sundarbans are classified into two groups according to their links to the following areas: (1) health status, and (2) health care utilization..

General morbidity rate is higher than the state average. Children are three times more vulnerable to respiratory ailments which also top the prevalence list. In general, almost all types of communicable diseases are highly prevalent. Environmental problems, such as skin related ailments are also very common. The impact of arsenic poisoning was quite visible in the blocks where groundwater is heavily contaminated with arsenic. People, who collect forest and river products, are under constant threat of animal attacks. The incidences of snake bites recorded in the local hospitals were high.

The dual burden of communicable and non-communicable diseases is quite evident like urban West Bengal. Coronary heart diseases (CHD) are estimated to affect 6 percent of population aged 40 years or more. Similarly, about 2.4 percent of adult population (>40 years) indicated high risk of arthritis while 42.4 percent were already diagnosed which was higher than the corresponding state average (35.3%). Bronchial Asthma chronically affects the elderly population at 8 percent prevalence rate. The inequalities in the spread of these ailments are also worth noting. Women and poor are more vulnerable to chronic ailments such as Arthritis and Asthma. There are other chronic problems, such as vision problems (farsightedness) which, despite their disproportionately high burden, remain largely unaddressed due to low perceived severity.

Remarkably high prevalence of mental health problemsdue to strong presence of various psycho-social stressors. Reported cases of Deliberate Self Harm cases have increased in the last few years.

About half of the children (below 5 years) are chronically malnourishedleading to their vulnerability to respiratory and gastro-intestinal ailments. Prevalence of respiratory ailments among children is higher than the state average. One in three children in the Sundarbans were found to have suffered at least one episode of cough with difficulty in breathing (faster than usual, short and rapid breaths) in the last two weeks compared to only 13 percent in West Bengal.

Women share disproportionately higher burden of ailments than men doespecially in the 15-59 age group. Data on the body mass index (BMI) of selected mothers indicate that a little less than one-third of women (31.5%) were underweight (i.e., BMI<18.5).

Health care utilization

Very high utilization of inpatient care reflected by high hospitalization rate (4.2%) which is almost equal to the state average. About two-thirds of total hospitalized persons in the Sundarbans sought admission in public hospital, which by Indian standard was quite high but by West Bengal's standard was low (40% in India and about 82% in West Bengal). However, the utilization of local facilities for inpatient care is relatively low as little more than one-fifth (21%) of all inpatients had sought admission from Kolkata and 43 percent of them were self-referred.

Absolute dominance of Rural Medical Practitioners (RMP) in outpatient care market. 62% of outpatients were treated by RMPs who rampantly practice modern medicines without formal training. This is a much higher rate then what was found in rural West Bengal (53%). According to the study results, the most obvious reasons for such dominance are physical proximity and affordable market prices of RMP services. Reduced transaction cost and trust were found to be two other important factors explaining high acceptability of these providers.

Utilization of maternal health care at institutions is low. Out of sample 569 mothers, who delivered at least one child in the last five years, only 29 percent delivered their last child at public or private institutions – a rate comparable to the rural areas of the most backward districts in West Bengal such as Uttar Dinajpur (23.6%) or Malda (26.4%). However, most of these institutional deliveries (about 71% of all institutional deliveries) were conducted at government hospitals. It is also interesting to note that utilization of ante-natal care is considerably high, yet institutional natal care is mostly unutilized. Difficult terrain and broken chain of transportation – especially in the least accessible islands - seem to force the mothers deliver births at home.

Sick children at the Sundarbans are more probable to receive treatment (compared to the children in other parts of the state). However, in most cases RMPs are the only or first source of treatment. The rate of child immunization is slightly lower than the state average.

Public health care system

Low Bed Occupancy Rate at local facilities (45% in North Sundarbans, 73% in South Sundarbans compared to 91% in West Bengal at the BPHC level) implying that large number of patients bypass local facilities to seek treatment in Kolkata or upper tier hospitals. The rates of hospitalization at local facilities are significantly low at the remote blocks (e.g., Gosaba, Basanti, Canning-2, and Sandeshkhali-2) indicating higher prevalence of self-referral in these blocks.

Utilization of outpatient care at public facilities is also at sub-optimum level. The number of outpatients per bed day at the BPHCs of the Sundarbans worked out to be 25 to 30 percent less than the state average, primarily because of easy availability of unqualified providers. The number of PHCs is conspicuously low (total 47, one per 90,000 population) and few of them are non-functional (without any doctor).

Physical infrastructure of the BPHCs is not a serious problem, but shortage of frontline workers and complementary equipment keep them partially ineffective. Availability of manpower is especially a matter of concern at the sub-centre level where about 16 percent of ANM's positions remained vacant in 2008 (15% in North and 17% in South Sundarbans). It is also important to note that two-thirds of all ANM vacant positions could be attributed to only five 'remote' blocks – Hingalganj, Sandeshkhali-2, Gosaba, Basanti, and Patharpratima – implying a negative correlation between the need and supply of health workers. The shortage of medical staff is less acute at the upper level facilities (BPHC, RH, and SDH). However, there are inequalities in allocation as demonstrated by the fact that three BPHCs were running with only 2 medical officers (Gosaba, Haroa, and Sandeshkhali-1) while six other reported more than 5 medical officers (in 2008). In addition, there had been an acute shortage of technical persons at this level making the service delivery package less effective in several facilities.

Without proper linked referral transportation, the service delivery system often fails to produce desired results. The geographical landscape of the Sundarbans makes it imperative to link the river and road transportation from a village to the nearest public hospital by a single chain.

The existing governance structure at the district level is not very favorable to make and implement separate plan for the Sundarbans. The region spreads over two districts making it difficult to see the Sundarbans as a separate entity. Even within a district, the data and problems of the non-Sundarbans blocks often confound the unique constraints of the service delivery system in the Sundarbans blocks.

Mobile health clinics on waterways, being operated by several voluntary agencies for a decade, offer a highly potential model for delivering services to water-locked islands. However, these clinics still could meet only a small part of the huge need for health care. Further, the probability of meeting the need of care for acute ailments is low especially for those diseases that require continuum care for a short period. The model is weakly integrated with the public health care system implying that the outcome generated from this initiative

has remained largely unknown and unexamined. The services provided by the agencies have almost established a channel parallel to the government system without a strong linkage effect.

Institutional birth delivery point, another PPP initiative, wherever established, have effectively addressed the barriers to access institutional care for birth deliveries to a large extent. However, apart from the fact that the numbers of such points are conspicuously small compared to people's need, the initiative is also constrained by the same set of factors as experienced in the cases of mobile clinics. In addition, treatment of common diseases should be included in the package – which is limited to birth delivery services at present – to buy in people's demand.

Several commendable independent NGO projects, but added together they are still inadequate to meet the need of under-served population. There is huge scope for these agencies to play roles that are more prominent. The independent 'project' initiatives need to be integrated with public health care system and an operational link need to be established between these initiatives.

Gaps in public health care have helped RMPs – the army of less qualified providers - establish a strong network of parallel health care. On average, a RMP treats 15-20 patients every day, about one-third of them being children below 5 years. Most common diseases treated by them are related to gastro-enteric (e.g., diarrhea) and respiratory ailments (common cough, cold, fever, and Asthma). However, people seek care also for relatively less common ailments; for example, about 22 percent of RMPs reported to have treated patients with mental health problems in the last one year.

Their treatment behavior often reflect lack of judgment regarding rational use of drugsalthough most of them were found to have basic knowledge about the diagnosis and primary purpose of modern medicines related to common diseases.

Poor are usually benefitted by RMP services but also bear huge risks associated with utilization of this unregulated practice. Besides irrational drug use, the risks manifest in (1) RMPs' increasing engagement in surgical intervention, (2) their gradual penetration in the inpatient market (i.e., clinics with beds), and (3) their poor referral practices.

The space is wide open for all categories of health careexcept routine preventive public health programs such as child immunization. For example, there is huge scope to increase institutional birth delivery by strengthening the PHCs and through scaling up partnership with the local NGOs. Similarly, high level of chronic child malnutrition creates an opportunity for community level intervention for (such as, positive deviance model) addressing the problem. By introducing a guided and linked referral transportation an increased rate of utilization of inpatient care at local facilities may be achieved. Similarly, by proper integration with and regulation of the RMP market one can achieve better quality outpatient care.

Geographically, six blocks are identified as 'priority' blocks in terms of available service delivery space and physical inaccessibility. These blocks are: Gosaba, Hingalganj, Patharpratima, Sandeshkhali-2, Namkhana, and Kultali.

<div align="center">

A plan for better future

</div>

A plan for a set of initiatives are proposed for consideration by all key stakeholders. There are five major components of the plan: (1) Strengthening public health facilities, (2) Providing basic health services at the village level, (3) Establishing a referral transport network, (4) Reorganizing existing and introducing new PPP initiatives at the least accessible areas, and (5) Innovations in use of information and communication technology.

For **strengthening public health facilities**, the proposed initiatives are: (1) renovating all 47 PHCs in the Sundarbans, (2) at least one PHC is designated 24×7 in each remote block (9 blocks), (3) upgrading the BPHCs of 6 priority blocks to provide basic EMoC services, and (4) river ambulance for BPHCs in the 9 remote blocks.

For **providing basic health services at the village level**, 100 Basic Health Guard Units (BHGU) will be made operational at the GP level of 6 priority blocks. The unit will provide basic curative services, referral services, safe delivery services, basic mental health services, and post-calamity basic health care. A trained diploma holding medical practitioner will be at the core assisted by two community health workers from existing pool (e.g., ASHA and second ANM). This unit will provide services on a daily basis under the technical supervision of local PHC doctor and with written guidelines on basic treatment and referral. A local agency will be contracted to operate this unit.

For **establishing referral network**, an exclusive referral transport chain (rickshaw van – boat – ambulance) will be provided to each BHGU on contractual basis. Local transporters will be contracted for this purpose. It will be managed on a PPP basis and will ensure quick linking of the broken chain of transportation to the nearest BPHC for those patients who are referred by a BHGU.

For **reorganizing existing PPP initiatives and introducing new PPP initiatives at the least accessible areas,** all existing initiatives will be aligned to BGHUs. For upscaling, a detailed assessment of existing initiatives will

be done. New initiatives, such as Mothers' waiting home, will be planned and implemented under NRHM program.

For innovations in use of information and communication technology, a GIS based surveillance technology will be introduced at the block level. In addition, the use of low cost diagnostic technology in public health programs will be encouraged.

The proposed plan will require a drive for decentralization of health governance in the Sundarbans. This would require establishing separate cells for the Sundarbans at the state and the district level. Three zones will be set up (2 in the South and 1 in the North) which will be led by an ACMOH and have maximum autonomy in planning and management. At the block level, the Block Society will be reformed to assume more responsibilities in supervising all PPP initiatives within the block. In addition, it will procure, stock, and supply essential drugs required in a post-calamity situation according to the advanced indent of the BHGUs within the block. One of the Medical Officers will provide technical support to the BHGUs and act as a nodal person for all PPP initiatives within the block. At the community level, a health watch group will be formed to oversee the process and results of BHGU and other PPP initiatives.

The plan will follow a low-cost strategy; hence, the additional requirement of resources will be within feasible limit. A ballpark estimate of additional investment works out to Rs. 830 million. A more rigorous costing procedure is however required in the next stage (during action plan process) to reach a more accurate estimate.

The area outside the reserve forest (54 islands), home of about 4 million people, is the human face of the Sundarbans. The inhabitance in the Sundarbans started even before the islands fully emerged through the siltation of rivers. Historically, the islands were occupied by migrant/refugees coming from several parts of India and Bangladesh. Initially, the inhabitants are the tribal labors brought by the British government to clear the forest who with time have settled in the region. Later, due to various natural calamities many people migrated from the neighboring districts (mainly Midnapore). In addition, during India's independence and during India-Pakistan war of 1972, a large number of migrants from Bangladesh found shelter in the tide-country of the Sundarbans. The human flow of multiple origins has made it a land of mixed culture.

In sharp contrast to its natural face, the human face of the Sundarbans epitomizes abject poverty, deprivation and acute suffering. Due to harsh geographical challenges, the islanders struggle to survive on subsistence-level return from diminishing natural endowments. Almost all of them depend on rain-fed / mono-crop agriculture, the forest (for forest products) and the rivers / estuaries (for fishing) which hardly provide adequate support to the households in terms of income and employment. The extent of poverty can also be gauged by the fact that a little less than half of the population (47%) belongs to the historically marginalized groups (such as scheduled castes and scheduled tribes) and more than half of the farming community (55%) are landless laborers.

The suffering face of the Sundarbans is perpetuated by a poor physical infrastructure. There are only 42 km of railway line and about 300 km of metal roads in the entire area of about 4500 square KM, almost half of which are inaccessible in the monsoons. People have to depend on simple or mechanized country boats (bhutbhuti) and limited number of steamer launches for moving from one island to the other or to the mainland. Due to inaccessibility, most of the inhabited areas still do not have conventional electric supply. Ironically, the area which is surrounded only by water, chronically suffers from lack of safe drinking water since the river water is salty and of no use for drinking. The system of earthen embankments which covers a length of 3500 KM and was built mostly by the settlers to protect themselves from flood is conspicuously fragile against the tidal actions which undercut the banks and often causes them to collapse.

In brief, the Sundarbans symbolize a world of human poverty and fragility packaged with natural richness; a world which is so close to the lights of development, yet so far. Interestingly, poverty here is cyclically entwined with the ecosystem; increasing economic stress makes people recklessly feed on natural resources which, in turn, leads to erosion of the traditional source of livelihood for the poor and builds more stress.

Increasing pressure of population, unregulated drives towards commercialization of natural products, and poor resource management add strength to this cyclical movement.

A glaring example of this conflicting relation is the practice of collecting shrimp spawns (Meen in Bengali) from the rivers. A significant proportion of the women population in the dwellings adjacent to the rivers and rivulets of the Sundarbans are engaged in this activity primarily to meet the demand for the spawns in the neighboring fisheries. The relatively easy money that comes to the people who catch the spawns, at the lowest end of a long chain that constitutes the shrimp trade, comes at considerable cost. Besides a high occupational risk of falling prey to crocodiles and small sharks while collecting the seeds and other health hazards, the process has already started showing symptoms of serious ecological damage, such as (1) extinction of many indigenous varieties of fishes which were abundant a few decades ago (since in course of collecting the seeds, the women (unknowingly) destroy many other aquatic lives)., (2) dwindling catches of shrimp spawns over the years due to indiscriminate collection, and (3) damaging the mangrove vegetation while fishing and the consequent erosion of the embankments. These damages, taken together, paint a dark picture of future livelihood of the Sundarbans' poor.

The principal driving force behind this study has been the keen interest of the government and a few non-government agencies to prepare a special health plan for the Sundarbans which would align to the existing master development plan for the area. The first step towards this plan is to identify the gaps in the health care delivery system and, accordingly, to project the unmet health needs of the people. Unfortunately, the available data, especially on the demand side, are too sparse and inadequate to identify the gaps. Consequently, there are several questions which remain unanswered: to what extent the health care needs of the Sundarbans are different from the rest of the state? How strong are the barriers to access a reliable source of health care? How even (or uneven) is the distribution of accessibility problem across all blocks of the area? What proportion of population remains uncovered by the present health care delivery system? And, so on.

In 2001, the average population of a block in the Sundarbans was about 198,000 (160,000 in North Sundarbans and 215,000 in South Sundarbans). Each block consists of about 130-140 villages surrounding the block headquarter town which is the prime centre for major administrative, development, and economic activities of all villages under the block.

Although geography plays a very important role in defining the socio-economic environment of the Sundarbans, it is important to note the variations in geographical challenges across the blocks. People, who live in the 'remote' Sundarbans - the blocks adjacent to the forest area or the Bay of Bengal – face much harder problems compared to those who live in the 'peripheries' (and closer to Kolkata). The blocks in the first group include Sagar, Namkhana, Patharpratima, Kultali, Gosaba, Basanti, Sandeshkali-II, and Hingalganj (map given in Chapter 1). The rest 11 blocks who are located closer to urban centers – the periphery Sundarbans – are benefitted in differing degrees by the spread of basic amenities including roads and electricity.

Access to basic amenities within a village in the Sundarbans has improved over the years; however, there is still a huge scope to make it better. As mentioned earlier, poor availability of drinking water is a chronic problem within the region. This is reconfirmed by the study since the major source of drinking water for more than three-quarters of the surveyed villages was deep tube well / hand pump. This is a vulnerable source especially in the flood-prone areas since, once submerged by the saline flood water, they become completely unusable. Moreover, some of the blocks (e.g., Haroa, Hasnabad, Canning) have groundwater heavily contaminated with arsenic; due to lack of any alternative source, the people are therefore exposed to arsenic poisoning2 .

The snapshot on 57 surveyed villages also reflects some progress towards better sanitation and improved road conditions within the villages. For example, subsidized covered pit toilets (pit latrine with slab) provided by the panchayats (the local self governments) were found to be the main type of toilet in 42 percent of the villages. About 40 percent of the villages were found to have their main roads (within the village) concreted or brick-bound.
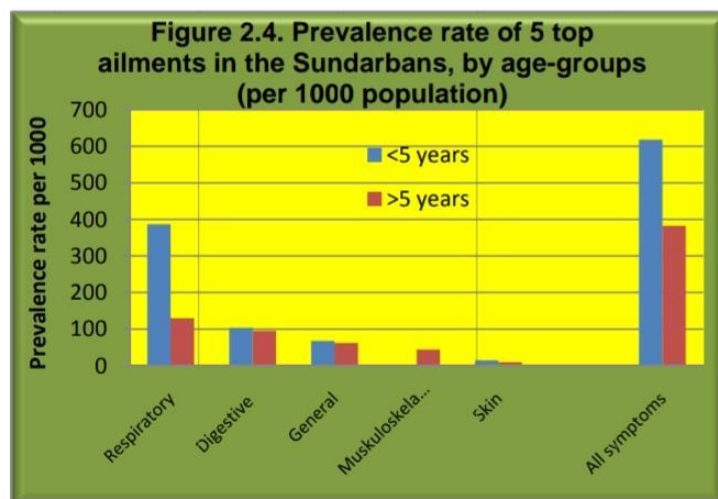
Mortality

The estimated crude death rate in the Sundarbans is 7.6 (47 died in the last 365 days before the survey) which is higher than that of rural West Bengal (6.3)[5]. As expected, the rate is much higher among people above 60 years of age (62 per 1000) followed by the under-5 children (9.3 per 1000). About 40 percent of these deaths could be attributed to symptoms related to whole range of digestive problems. Almost all those who died (85%) received some sort of medical attention before death although only 30 percent of them were hospitalized before death implying that the underlying cause of death might have remained largely unknown.

General morbidity

How sick are the people of the Sundarbans? The scenario emerging from the self-perceived morbidity reflects a worrying health profile of the region. About 38 percent of the male and 40 percent of the female population experienced some sort of ailments in the last one month, either old or new. These rates are significantly higher than the state average – 24 percent of the male and 26 percent of the female population – as reported in the NSSO report in 2004[6]. The rate when disaggregated by age-groups shows a usual U-shape indicating higher concentration of morbidities among the children and the

Figure 2.3. Age-specific self-assessed morbidity rate in the Sundarbans (last 30 days)

older persons (Figure 2.3). It is also worth noting that the morbidity is slightly skewed towards female population in the middle age groups (15 – 59 years).
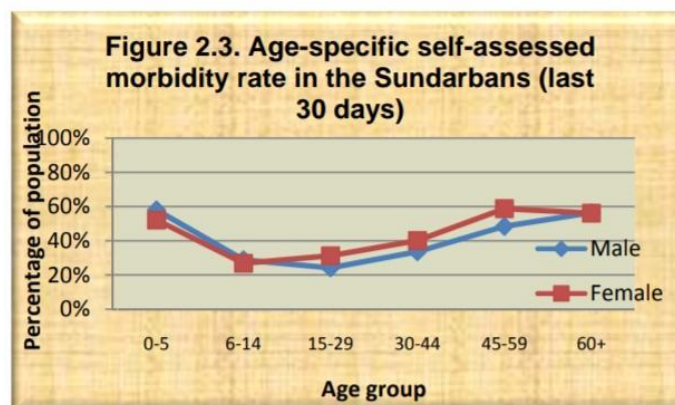
The symptoms reported by the ailing responders indicate that most of the ailments were common and related to either digestive (or, gastro-intestinal) system, or respiratory system, or partial disability due to general symptoms such as weakness (Figure 2.4). The most common symptoms for respiratory ailments were (1) fever with cold and cough and (2) difficulty in breathing. The major digestive system related symptoms were (1) intestinal gas, and (2) pain in lower abdomen. Among all musculoskeletal problems, the most common symptom was 'back pain'.

Figure 2.4. Prevalence rate of 5 top ailments in the Sundarbans, by age-groups (per 1000 population)

The nature of morbidity derived from a symptomatic search may not be adequate to conclusively determine the burden of diseases in an area. However, despite the limitation, several epidemiological leads are worth noting. First, the children (below 5 years) were three times more vulnerable to respiratory ailments than the rest. Second, almost all types of communicable diseases – primarily related to respiratory and gastro-intestinal systems - are highly prevalent in the Sundarbans in varying degrees making it a perfect public health laboratory for health managers. For example, the survey found 13 TB cases (diagnosed and under treatment) implying an estimated prevalence rate of 2.61 per 1000 population which was slightly higher than the Indian average of 2.27[7]. Third, the link between the geo-climatic environment of the Sundarbans and people's health is evidenced by high prevalence of a few environmental health problems. For example, skin related

Chronic and non-communicable ailments

Ailments related to communicable and acute health conditions, however, present an incomplete health scenario of the Sundarbans. To complete the picture one needs to look at the non-communicable and chronic ailments which usually remain neglected by the policy makers despite significant poverty dimensions of these ailments. The present study, which investigated the prevalence of six major chronic ailments (Arthritic pains, Cardio-vascular problems, asthma, diabetes, skin related problems, and vision problems) among 834 persons of more than 40 years old (413 male and 421 female members), came up with some serious concerns in this regard.

People's vulnerability to chronic and non-communicable diseases is no less severe in the Sundarbans in comparison to other parts of the state. In other words, the Sundarbans now face the dual burden of communicable and non-communicable diseases like urban West Bengal. For example, coronary heart diseases (CHD), which are usually linked to urban lifestyles, are estimated to affect 6 percent of population aged 40 years or more (Table 2.1). This means that about 240,000 people in the Sundarbans are highly vulnerable to CHD8 . Similarly, about 2.4 percent of adult population (>40 years) indicated high risk of arthritis while 42.4 percent were already diagnosed which was higher than the corresponding state average (35.3%)9 . Bronchial Asthma chronically affects the elderly population at 8 percent prevalence rate. The inequalities in the spread of these ailments are also worth noting. For all of these ailments, the poor and the women (except CHD for biological reasons) were more likely to be affected. For example, the prevalence of bronchial asthma among poorer section was about six times higher than among the better-offs. The data also suggest that, contrary to the conventional beliefs, the prevalence of CHD risk would be considerable high among the poorer people .

	N	% of population with high risk (40 years and older)		
		CHD	Arthritis	Bronchial Asthma
Sex				
Male	413	7.3	1.2	7.7
Female	421	4.8	3.6	8.3
Economic condition				
Poor	273	5.1	3.3	10.3
Medium	276	8.0	1.8	8.0
Least poor	285	4.9	2.1	6.0
Health condition in last 30 days				
Severe	325	7.3	4.3	13.2
Moderate	194	3.6	2.1	7.7
No or mild problem	315	6.0	0.6	2.9
Total	834	6.0	2.4	8.0

Figure 2.5. Prevalence of Tobacco and Alcohol use among > 40 years in the Sundarbans
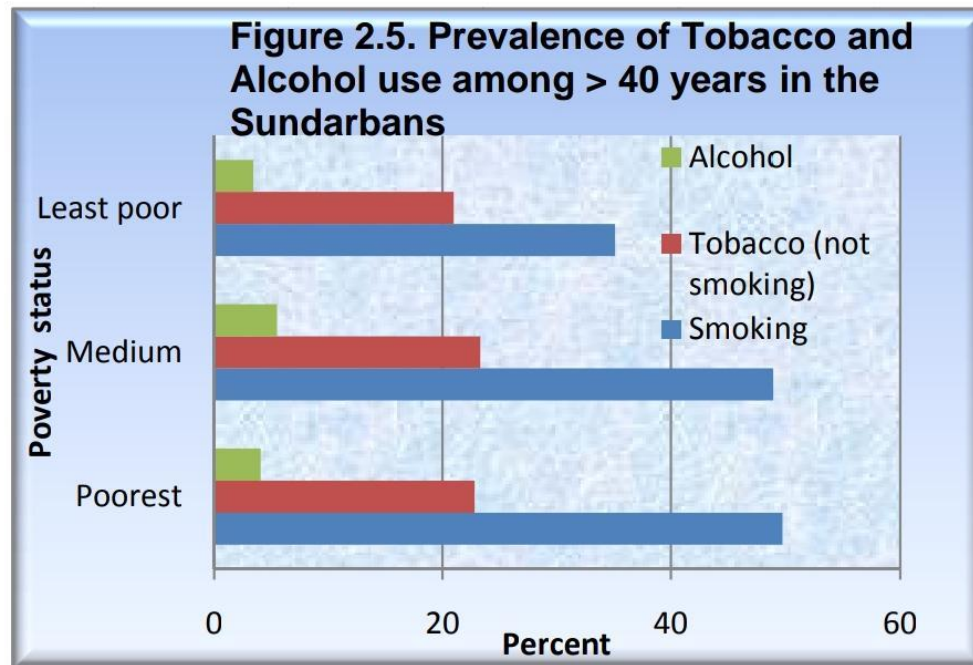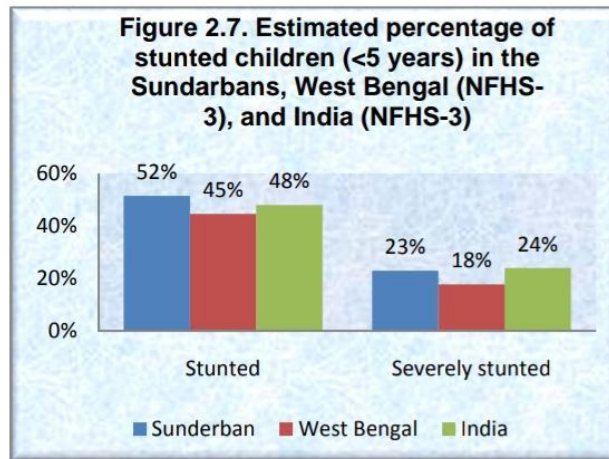
Mental health

 Mental health problems threaten to be one of the most critical public health issues in the Sundarbans. The FHS household survey did not attempt to assess the mental health conditions; however, evidences from other sources indeed indicate an alarming prevalence and spread of these conditions. The most visible indicator of psychiatric disorders is the prevalence of deliberate self harm (DSH), or grossly the 'attempted suicide' cases, which, despite its severe limitation in capturing the total mental disease burden, projects the severity of the problem to a large extent. According to a study based on the admission data in 13 BPHCs in the Sundarbans, a little more than 5000 non-fatal DSH cases were registered in three years (1999-2001)[11]. In other words, an average of approximately 11 such cases were registered per month in each BPHC. Two crucial findings of this study are worth noting: (1) about two-third of the admitted persons (for non-fatal DSH) were female, and (2) 85 percent of the admitted persons had committed DSH by consuming chemical poison or, more specifically, organophosphorous pesticides.

Deliberate Self-Harm is however an extreme manifestation of mental ill-health and affects only a few. Lying underneath DSH remains a complex set of psycho-social stressors which are closely linked to the gripping livelihood challenges in the region and may trigger a pandemic of mental health problems. Several studies have indicated high presence of such stressors in the Sundarbans. Besides poverty and economic stress, these include marital conflicts, alcoholism and resultant torture, extra-marital affairs, and growing insecurity against nature's challenges. The most common diseases, as found in one study, are major depressive disorders, followed by Somatoform pain disorder, posttraumatic (animal attack related) stress disorder, and adjustment disorder[12]. Chronic neglect of these problems, women's low status, and easy availability of pesticides in an agro-based region may explain why an increasing proportion of affected persons – mostly women - have been seeking solace in self destruction. In villages adjacent to forest, where communities depend on fishing and collecting forest products, people are especially unsecured against animal attacks which often make them adopt a fatalistic coping strategy such as superstitious responses and dependence on local god / goddess (such as, Banbibi) and traditional faith healers (such as, Gunin) which probably act as protective shield against mental disorders.

Child health

The health status of the children of the Sundarbans is in a sorry state. This is partly reflected in the nutritional status of the children under the age of 5 years. Based on the weight, age, and height data of 632 children (<5 years), the anthropometric indicators reflected that about half of the children in the Sundarbans (52%) were stunted (i.e., low height for age), or, in other words, were suffering from chronic malnutrition (Figure

Figure 2.7. Estimated percentage of stunted children (<5 years) in the Sundarbans, West Bengal (NFHS-3), and India (NFHS-3)

2.7). The proportion of chronically malnourished children is higher than both state (45%) and national average (48%) implying that in the Sundarbans a comparatively higher proportion of the children are growing up with serious nutritional retardation.

Why are so many children stunted or chronically malnourished? Stunting, which is usually regarded as the best indicator of children's long run health status and well being[13], is a biological adaptation to inadequate food, frequent episodes of disease, or both during the first few years of life. In other words, a high stunting level among the children in the Sundarbans mirrors chronic poverty and food insecurity among a large part of the population.   .

Chronic malnutrition usually has a spiraling effect on the vulnerability of the children to respiratory and gastro-intestinal ailments. Figure 2.8 reestablishes this phenomenon in the present context and reveals a disproportionately higher burden of these ailments in the Sundarbans. The proportion of children under age five who had at least one spell of fever during the last two weeks was almost double in the Sundarbans compared to the

state average (NFHS-3). The prevalence of Acute Respiratory Infection (ARI) such as Pneumonia was also exorbitantly high in the Sundarbans – one in three children had suffered at least one episode of cough with difficulty in breathing

Figure 2.8. Percentage of children under 5 years suffered from common ailments in the last 2 weeks
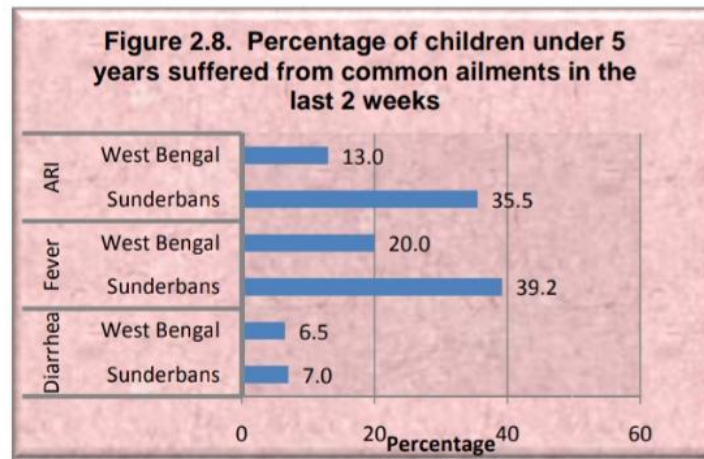
(faster than usual, short and rapid breaths) compared to only 13 percent in West Bengal. The incidence of diarrhea was also slightly higher in this region even though the survey was carried out in a relatively low-prevalent season (December-January).

Incidences of respiratory ailments are much higher among the Sundarbans' children. There is a great deal of inequalities in incidences across age, sex, and socioeconomic status.

The inequality in the spread of the common childhood ailments across age, location, and socio-economic status is also worth noting. For example, a child in the age group 12 -23 months was more likely to be affected by ARI (40%) compared to his / her younger counterpart (28% for 0-6 months). Similarly, girls were more vulnerable to diarrhea (8.2%) than the boys (6%).

The same held good for the children from the relatively poorer section who had suffered all of these ailments at a disproportionately higher rate. Children from the South Sundarbans were also found in worse condition compared to their north counterpart.

Women's health

The evidences collected through the FHS survey did not reflect an impressive scenario about women's health in the Sundarbans. In general, women reported general ailments in larger proportion than their male counterpart especially in the 15-59 age-group (Figure 2.5) without much difference in the ailment profile. They were also more vulnerable to common chronic ailments (such as asthma, arthritis, and vision problems). The inequity manifests more prominently when data are disaggregated by socio-economic status. For example, in the 'poorest' section, 131 women per 100 men reported severe or

extreme vision problem while in the 'least poor' category the corresponding number was 91 (per 100 men).   A closer scrutiny of the health of the mothers (who delivered at least one child in the last five years) reveals more. The body mass index (BMI) based on the weight, age, and height data collected from 489 mothers indicate that a little less than one-third of women (31.5%) were underweight (i.e., BMI<18.5).

It is hard to exaggerate the gender issues which underpin the health status of women in the Sundarbans. For example, catching spawns in riverbeds is a pretty common affair of the women from a fisherman family since the activity perceptibly does not require much skills or physical strength. The activity brings little extra money to the families but with a huge health risk. The women (and children), while catching spawns, become an easy prey to crocodile and sharks, get affected by skin diseases due to constant touch with saline water, and develop back pain due to bending pressure on back. Similarly, they are vulnerable to various reproductive tract infections communicated while bathing in highly contaminated pond water.

As mentioned earlier, women in the Sundarbans are disproportionately affected by mental health problems.   A study conducted on the clinical records of patients admitted for deliberate self harm (i.e., attempted suicide) to six government hospitals in the Sundarbans found that women accounted for 65 percent of DSH admissions and 67 percent of the deaths (due to DSH)[14]. The vulnerability of women to mental disorders in particular and to general health problems in general has its root in highly fragile status of women in the Sundarbans, chronically perpetrated by poverty, destitution, domestic violence, and utter indifference of society to their problems

Box 2.2. A woman without mind

The family does not force her do any work against her will. When FHS team visited the household, Kamala, in her mid 50s was sitting on the front staircase. Badal, her eldest son, who seems to be at early 30s, always has seen her mother being different than other women of the village. He in his early childhood was told by the neighbours that her mother has "mathar byamo" (mental health problem).   "Has anybody ever got her treated?" No, Badal could not remember such thing; moreover, she is physically alright and can do many household works.
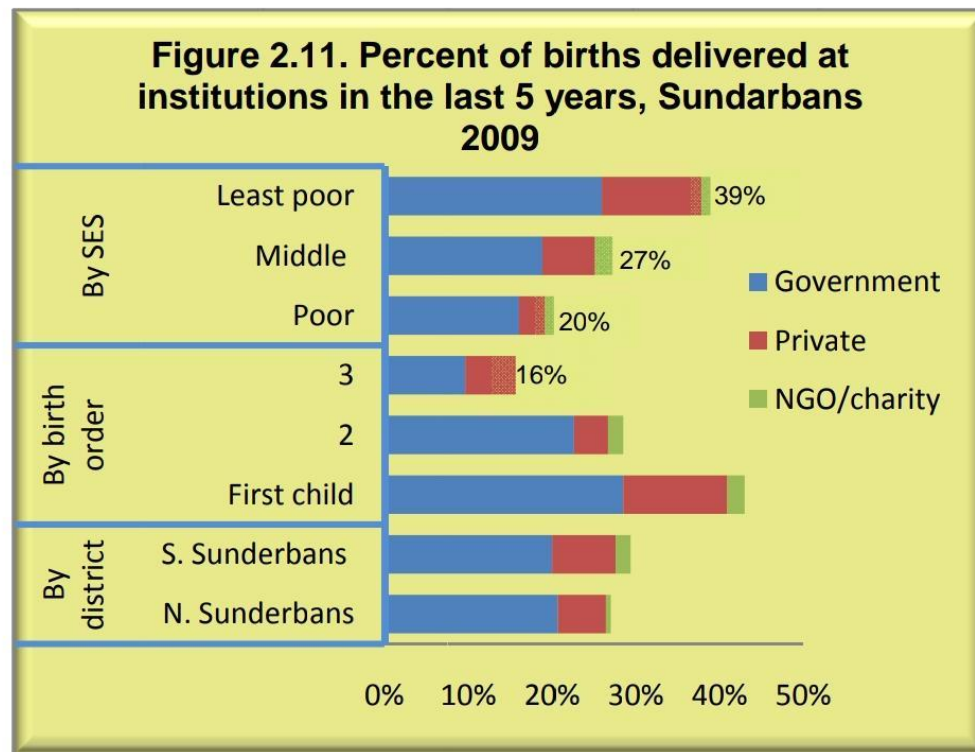
Table 2.2. Hospitalization rate (% of population) in the Sundarbans and West Bengal

	% of population hospitalized in a year		
	Sundarbans 2009 (IIHMR)	West Bengal 2007 (IIHMR)[1]	West Bengal 2004 (NSS0)[2]
Sex			
Male	4.24	4.50	2.75
Female	4.13	3.96	2.49
Economic condition			
Poor	4.57	3.59	2.03
Medium	3.54	3.65	2.25
Least poor	4.26	5.01	3.22
Age group			
Below 15	3.34	3.51	1.80
15-59	4.00	4.33	2.56
60 -	8.38	6.53	6.05
Source of care			
Public hospital	2.72 (65%)	3.49 (82%)	1.90 (74%)
Private hospital	1.46 (35%)	0.75 (18%)	0.67 (26%)
Total	**4.18**	**4.23**	**2.57**

Table 2.3. Percent of ailing persons seeking outpatient care, by source of care, Sundarbans 2009

	% of ailing persons who sought treatment from			
	RMP	Government Facilities	Private Qualified	NGO/Charity
District				
North Sundarbans	56.9	13.7	21.8	4.2
South Sundarbans	64.3	10.1	21.6	0.9
Blocks				
Remote Sundarbans	63.1	10.7	21.4	2.9
Periphery Sundarbans	61.5	11.5	21.9	1.2
Socio-economic group				
Poor	68.9	9.1	17.1	1.7
Middle	62.1	12.1	20.8	2.8
Rich	54.9	12.4	27.5	1.2
Sundarbans	62.1	11.2	21.7	1.9
West Bengal (Rural)	53.7	22.9	14.7	-

Figure 2.11. Percent of births delivered at institutions in the last 5 years, Sundarbans 2009

Most of those who could break the above two barriers are trapped by another important constraint – the geographical adversities – which are embedded within the economic and social barriers and are often difficult to assess from quantitative data. The results show that a woman, who delivered birth at home, would have to travel 8 KM on average had she decided to deliver birth at the nearest public hospital. However, the physical distance in the Sundarbans often fails to reflect the degree of inaccessibility as travelling a short distance in some pockets may mean quite a hardship due to broken transportation linkages or unavailable water transportation when it is most required. For example, a woman living at Lahiripur in Gosaba block would be required to visit Gosaba BPHC (hospital at the block headquarter) if she wants to deliver birth at a hospital (Figure 2.12). The shortest route to reach the BPHC would require her to walk or travel by van rickshaw a distance of 9 KM, cross a river, and then again ride a van rickshaw to cross a distance of 5.5 KM. In addition to hardships of cross-transportation, the whole journey would take about 3 to 3.5 hours. If she decides to avoid break-journeys and to travel by a single mode, she would take the river route (from Lahiripur to Bali, Bali to Gosaba BPHC) and reach the destination after a journey of 6-7 hours. A more viable alternative, in this case, would be to take a risk of delivering birth at home, or to helplessly wait for the morning if the problem starts at night.

The health scenario of the Sundarbans offers little to celebrate. A typical resident of the Sundarbans carries an extra load of ill-health and health risks compared to others living within the same district. Poverty, coupled with sharp geo-climatic challenges, make him / her especially vulnerable to health shocks caused by environmental and life style related agents. As the FHS survey found, the islanders are doomed to struggle with both communicable and non-communicable diseases often leading to complete disorder in priorities to tackle the problems. The children are the worst sufferers; most of them are chronically malnourished and, hence, perennially suffer from disproportionately higher burden of respiratory and gastro-enteric troubles. Women and poor are especially vulnerable to the chronic and acute health conditions. In brief, with 4 million people currently estimated to live in the region, this neglected population has become a major reservoir for a wide spectrum of health conditions that are not always well recognized by the existing formal health sector.

NOTE AND REFFERENCES

1. Dreze J. And Sen A., India Development and Participation, Oxford University Press, New Delhi, (2005)

2. Baru R., Acharya A., Acharya S., Shiva Kumar A.K. And Nagraj K., Inequalities in Access to Health Services in India: Caste, Class and Region, Economic and political Weekly, 65(38), (2010)

3. Rajeshwari and Sinha S., Spatial Inequalities in the development of Public Health Care Facilities in Rural Haryana, India: Health Care Patterns and Planning edited by Akhtar R., A P H Publishing Corporation, New Delhli, (2004).

4. Pradad B.A., Occupational Health Problems of Woman Migrant Workers in Thogamalai, Karur District, Tamil Nadu, India, Int. Res. J. Social Sci., 2(4), 7-15, (2013), Retrieved, August 5, 2014, from http://www.isca.in/IJSS/

5. Provisional Population Tables, Census of India (2011)

6. Shahi G., Post-Independence Health Facilities in India: An Evaluation, Geog. Perspective, 5(2), 26-32, (1991)

7. Aich M., Mahzebin M., Fahriasubarna N. and Hassan A., A Study on Socio-Economic Condition and Nutritional Profile of Women Workers in Shrimp and Agriculture Sectors in Selected Two Districts of Bangladesh, Int. Res. J. Social Sci., 3(3), 15-21, (2014), Retrieved, August 5, 2014, from http://www.isca.in/IJSS/

8. Sunilkumar, Kamalapur M. and Reddy S., Women Health in India: An Analysis, Int. Res. J. Social Sci., 2(10), 11-15, (2013) Retrieved, August 5, 2014, from http://www.isca.in/IJSS/

9. Trivedi R., Adhikari P., Singh S., Singh S. P., Sharma V., Mishra A. And Goyal A., Prevalence of Practices of Preventive Health Care Measure and its Causes among Medical Professionals of Shyam Shah Medical College, Rewa, India, Int. Res. J. Social Sci., 3(6), 17-22, (2014), Retrieved, August 5, 2014, from http://www.isca.in/IJSS/

10. District Human Development Report of Retrieved, August 5, from http://www.isca.in/IJSS/South 24 Paraganas, Retrieved, July 30, 2014, from http://www.wbplan.gov.in/HumanDev/DHDR/24%20pgsSouth/Chapter%2001%20FINAL-1.pdf, (2009)

11. Shabnam S., Spatial Inequality in Health Care Infrastructure in West Bengal, Indian J. of Reg. Sci., 34(2), 26-34, (2012)

12. Jackson A.A., Human Nutrition in Medical Practice: The Training of Doctors, Proceedings of Nutrition Society, 60, 257-263, (2001) cited by Somannavar M.S., Proposal for Incorporation of Nutrition Science in First Year Undergraduate Medical Curriculum in India, Int. Res. J. Social Sci., 1(2), 60-62, (2012), Retrieved, August 5, 2014, from http://www.isca.in/IJSS/

13. Choubey K., Health Care Delivery in Madhya Pradesh, India: Health Care Patterns and Planning edited by Akhtar R., A P H Publishing Corporation, New Delhi, (2008)

14. . Soman K., Rural Health Care in West Bengal, Eco. and Pol. Weekly, 37(26), 2562-2564, (2002)