ISSN. 0972 - 8406
The NEHU Journal, Vol XII, No. 2, July - December 2014, pp. 77-100

Access to Public Health-Care in the Rural Northeast India

Dilip Saikia and Kalyani Kangkana Das*

Abstract

Despite phenomenal economic growth over the last two decades, India has done lesser than expected to improve the health-care sector. Even though the National Rural Health Mission (NRHM), launched by the Government of India in 2005, has made significant progress in the health-care infrastructure of the country, the improvement has been quite uneven across regions, especially in the north-east, with large-scale rural-urban variations and limited accessibility to health-care services in rural areas. In this context, this paper critically examines and evaluates the current status of public health infrastructure in the rural areas of the northeastern region of India.

Keywords: accessibility, health infrastructure, rural health, shortage of health manpower.

Introduction

The health condition of the people of a nation largely depends on an effective and well developed health-care system. However, even after six decades of planned development process initiated in India, its health-care sector is quite unsatisfactory. Although India has achieved unprecedented economic growth in the post-reforms decades (Saikia,2012), it has performed poorly in terms of health sector development (Baru et al., 2010). India has been lagging behind other developing countries like China, Sri Lanka and Bangladesh in terms of the state of health-care infrastructure and many health indicators such as life expectancy at birth, infant mortality and under-five mortality levels etc. (Government of India, 2005, 2012b).

---

* *Dilip Saikia (dilip.gu@gmail.com) is an Assistant Professor in the Department of Commerce, Darrang College, Tezpur, Assam.*
Kalyani Kangkana Das is a Research Scholar in the Department of Economics, Gauhati University, Assam.

Recognising the role of health in development and the importance of health infrastructure in improving health, the Government of India launched the National Health Policy in 2002 and the National Rural Health Mission (NRHM) in 2005 to strengthen the rural health-care infrastructure in the country. The NRHM aims to provide effective health-care to the rural population in the country with special focus on the states which have poor health indicators and inadequate public health infrastructure facilities. The NRHM mainly focuses on improving access to equitable and affordable primary health-care services such as women's health, child health, water, sanitation & hygiene, immunisation and nutrition, etc. to the rural people, especially women and children.

Although India has made considerable progress in health infrastructure under NRHM, the improvement has been quite uneven across regions with large-scale inter-state variations (Kumar, 2013; Hazarika, 2013; Baru *et al*., 2010). Further, accessibility to health-care services is extremely limited in many rural areas and backward regions of the country. As per the National Health Policy 2002 only 24 percent villages in India have health-care facilities as against 88 percent towns and only 34 percent medical professionals are in rural areas as against 66 percent in urban areas. Bhandari and Dutta (2007) observe that while about 70 percent of India's population live in rural areas, only 20 percent of hospital beds are located in rural areas.

In this context, the present paper seeks to examine the status of health-care infrastructure in the rural areas of the northeastern region (NER) of India, which is one of the most backward regions of the country, wherein about 81.6 percent of population (Census 2011) in the region lives in the rural areas. The paper attempts to analyse the current status of rural health infrastructure, health-care facilities, health workers, accessibility of health-care services and safety and acceptability of health-care services in the rural areas of the north-eastern states after the implementation of the NRHM in 2005. The rest of the paper is organised in the following sections. The next section briefly outlines the methods and analysis used in this paper. Section 3 discusses the status of public health-care infrastructure across the north-eastern states. The last section summarises the findings with policy implications.

Data and Method

This paper is solely based on secondary data. Data used in this paper were collected from four sources – (a) Bulletin on Rural Health Statistics 2011, (b) National Health Profile 2011 (both are published by the Ministry of Health and Family Welfare, Government of India), (c) Population Census 2011 published by Registrar General, Government of India, and (d) District Level Household and Facility Survey (DLHS-3) 2007-08, conducted by International Institute for Population Sciences (IIPS), Mumbai.

The analysis carried out in this paper is qualitative and descriptive. The narratives have been explained by analysing five dimensions of health-care infrastructure, viz. physical infrastructure required to provide health-care facilities to a patient; facilities available in the health institutions for patient's treatment; availability of health workers of different categories; accessibility of the health-care facility; and safety and acceptability of health-care services. Even if only one of these components is missing, a patient is unlikely to receive appropriate and quality health-care services.

Health Status in the NER

There is a wide range of indicators to measure the health status of people. We mainly look at four key health indicators namely crude birth rate (CBR), crude death rate (CDR), infant mortality rate (IMR) and child immunisation. Table 1 presents the health situation in the NER vis-à-vis India separately for rural and urban areas in terms of these indicators. It is evident that all the northeastern states except Assam and Meghalaya are in better position than the national average in terms of CBR, CDR and IMR in both the rural and urban areas. In particular, Manipur, Nagaland and Sikkim are well ahead of the national average and the other north-eastern states in all the three indictors. For Assam and Meghalaya the condition is better than the national average in case of CBR and CDR in the urban areas, but their condition is below the national average and other northeastern states' average in the rural areas, whereas in case of IMR the condition of both the states is below the national average as well as other northeastern states in both the rural and urban areas. These are the health outcome-indicators. It is also important to look at the health input-indicators. Here we look at child immunisation, which is very crucial to promote child survival and prevent infant mortality. We have used two measures of child immunisation – *Immunisation-1*, defined as percentage

Table 1: Health Indicators in the NER vis-à-vis all India

States	Area	CBR 2010	CDR 2010	IMR 2010	Immuni-sation-1 2007-08	Immuni-sation-2 2007-08
Arunachal Pradesh	Rural	22.1	6.9	34	13.9	11.5
	Urban	14.6	2.3	12	12.5	13.7
	Combined	20.5	5.9	31	13.5	12.1
Assam	Rural	24.4	8.6	60	50.0	11.6
	Urban	15.8	5.8	36	55.3	7.1
	Combined	23.2	8.2	58	50.9	11.2
Manipur	Rural	14.8	4.3	15	44.1	11.6
	Urban	15.3	4.0	9	65.2	6.6
	Combined	14.9	4.2	14	48.5	10.6
Meghalaya	Rural	26.6	8.4	58	31.2	14.1
	Urban	14.8	5.6	37	55.1	12.9
	Combined	24.5	7.9	55	33.7	14.0
Mizoram	Rural	21.1	5.4	47	46.8	6.0
	Urban	13.0	3.7	21	68.4	1.2
	Combined	17.1	4.5	37	54.5	4.3
Nagaland	Rural	17.0	3.7	24	NA	NA
	Urban	16.0	3.3	20	NA	NA
	Combined	16.8	3.6	23	NA	NA
Sikkim	Rural	18.1	5.9	31	77.1	0.5
	Urban	16.1	3.8	19	91.6	0.0
	Combined	17.8	5.6	30	77.8	0.5
Tripura	Rural	15.6	4.8	29	36.4	21.6
	Urban	11.5	5.7	19	63.4	5.7
	Combined	14.9	5.0	27	38.5	20.3
All India	Rural	23.7	7.7	51	50.6	5.2
	Urban	18.0	5.8	31	63.1	2.9
	Combined	22.1	7.2	47	54.1	4.5

Notes: CBR=Crude Birth Rate, CDR= Crude Death Rate, IMR= Infant Mortality Rate, Immunisation-1= Percentage of children aged 12-23 months fully immunised, Immunisation-2= Percentage of children aged 12-23 months not received any vaccination. NA= Data not available.

Source: Bulletin on Rural Health Statistics in India, 2011 and District Level Household and Facility Survey (DLHS-3), 2007-08.

of children aged 12-23 months received full immunisation comprising of BCG, three doses of DPT, three doses of Polio (excluding Polio 0) and measles; and *Immunisation-2*, defined as percentage of children aged 12-23 months not received any vaccination. Table 1 reports these two indicators from the District Level Household and Facility Survey (DLHS-3), 2007-08. It appears from the Table that all the northeastern states except Sikkim and Mizoram are below the national average in achieving full child immunisation and all the northeastern states except Sikkim are far below the national average in terms of failure to provide any vaccination to children in both the rural and urban areas. The health condition in the rural areas in all the states is more pitiable compared to the urban areas in terms of all the health indicators. The rural-urban gap in the health situations across the northeastern states is clearly visible from Table 1. In view of this, the rural health-care should be an area of utmost priority of any government social sector policy, especially health policy.

Status of Rural Health Infrastructure

The rural health-care infrastructure in India has been developed as a three tier system with Sub-Centre (SC), Primary Health Centre (PHC) and Community Health Centre (CHC) being the three pillars. The establishment of these health centres is based on the population norms of 5000 per Sub-Centre, 30000 per PHC and 120000 per CHC in Plain areas and, 3000 per Sub-Centres, 20000 per PHC and 80000 per CHC in Hilly/Tribal/Desert areas. Further, there will be six Sub-Centres per PHC and four PHCs per CHC (GOI, 2011). The growth of these health-care institutions, especially growth of the Sub-Centres is a prerequisite for the overall progress of the entire system.

The Sub-Centre is the most peripheral and first contact point between the primary health-care system and the community. Sub-Centres, manned by one Auxiliary Nurse Midwife (ANM)/Female Health Worker and one Male Health Worker (and one additional second ANM under NRHM), are expected to provide services in relation to maternal and child health, family welfare, nutrition, immunisation, diarrhoea control and control of communicable diseases programmes. There are 148124 Sub-Centres functioning in the country as on March 2011, of which 7259 (4.9 percent) are located in the NER (Table 2).

The PHC is the first contact point between village community and the medical officer. A PHC, manned by a Medical Officer and 14 paramedical and other staff, acts as a referral unit for 6 Sub-Centres and has 4 to 6 beds for patients. PHCs are envisaged to provide an integrated curative and preventive health-care to the rural population. As on March 2011, there are 23887 PHCs in India, of which 1510 (6.3 percent) are located in the NER (Table 2).

The third layer of India's rural health-care system is CHC. A CHC, manned by four medical specialists (i.e. Surgeon, Physician, Gynaecologist and Pediatrician) and 21 paramedical and other staff, acts as the referral centre for four PHCs and also provides facilities for obstetric care and specialist consultations. It has 30 in-door beds with one Operation Theatre, X-ray, labour room and laboratory facilities. As on March 2011, there are 4809 CHCs in India, of which 244 (5.1 percent) are located in the NER (Table 2).

Table 2
Progress in Health Centres

States	March 2005			March 2011		
	Sub-Centres	PHCs	CHCs	Sub-Centres	PHCs	CHCs
Arunachal Pradesh	379	85	31	286	97	48
Assam	5109	610	100	4604	938	108
Manipur	420	72	16	420	80	16
Meghalaya	401	101	24	405	109	29
Mizoram	366	57	9	370	57	9
Nagaland	394	87	21	396	126	21
Sikkim	147	24	4	146	24	2
Tripura	539	73	10	632	79	11
NER	7755	1109	215	7259	1510	244
All India	146026	23236	3346	148124	23887	4809

Source: Bulletin on Rural Health Statistics in India, 2011.

Considering the progress in physical infrastructure under NRHM, Table 2 reveals that for the country as a whole the number of Sub-Centres

has increased from 146026 to 148124, PHCs from 23236 to 23887 and CHCs from 3346 to 4809 during 2005 to 2011; whereas in the NER the number of Sub-Centres has declined from 7755 to 7259 and number PHCs and CHCs has increased from 1109 to 1510 and 215 to 244 respectively. The decline in Sub-Centres in the region is mainly because many of the Sub-Centres have been upgraded to PHCs, which is evident from the fact that the number of PHCs in the region has increased during this period. Individually Assam and Arunachal Pradesh have experienced significant decline in the number of Sub-Centres, whereas number of Sub-Centres has increased in Tripura and for the rest of the states it remains more or less same. All the states but Mizoram and Sikkim have witnessed progress in PHCs. The number of CHCs showed a decline in Sikkim, whereas the number of CHCs in other northeastern states either remained unchanged or showed a small increase.

Table 3 shows the current status of rural health centres in the north-eastern states *vis-à-vis* the country as a whole in terms of the average rural population covered by a Sub-Centre, a PHC and a CHC in 2005 and 2011. For the country as a whole a Sub-Centre in the rural areas had to serve 5085 people, a PHC had to serve 31954 people and a CHC had to serve 221904 people as on March 2005. But the population coverage by Sub-Centre, PHC and CHC stood at 5624 people, 34876 people and 173235 people respectively. Compared to the national average of population coverage by a health centre in 2005, all the north-eastern states are in better position in case of Sub-Centre, whereas all the states except Assam and Tripura are in better position in case of PHC and CHC. By 2011, there has been an increase in the population coverage by a Sub-Centre in all the states except Nagaland, Sikkim and Tripura. Similarly, the coverage by a PHC increased in Arunachal Pradesh, Manipur, Meghalaya and Mizoram; and that by a CHC also increased in all the states except Arunachal Pradesh, Nagaland and Tripura. Compared to the national average of population coverage by a health centre in 2011, all the north-eastern states except Assam and Meghalaya are in better position in case of Sub-Centres, whereas in case of PHCs all the states and in case of CHCs all the states but Assam, Sikkim and Tripura are in better position.

Table 3
Population Coverage by Health Centres

States	Average Rural Population (Projected 2005) covered by a Health Centre in 2005			Average Rural Population (Census 2011) covered by a Health Centre in 2011		
	Sub-Centres	**PHCs**	**CHCs**	**Sub-Centres**	**PHCs**	**CHCs**
Arunachal Pradesh	2296	10236	28067	3738	11022	22274
Assam	4544	38059	232163	5817	28551	247968
Manipur	3788	22095	99426	4523	23745	118727
Meghalaya	4650	18462	77696	5849	21734	81689
Mizoram	1223	7852	49730	1430	9281	58782
Nagaland	4181	18934	78440	3553	11166	66993
Sikkim	3272	20041	120245	3123	18998	227981
Tripura	4923	36349	265345	4288	34304	246368
All India	5085	31954	221904	5624	34876	173235

Source: Bulletin on Rural Health Statistics in India, 2011.

As far as the fulfillment of the population coverage norm is concerned, for the country as a whole the existing population norms are yet to fulfill in all the three categories of health centres. All the north-eastern states but Mizoram are yet to satisfy the population norms in case of Sub-Centres, whereas Assam, Manipur, Meghalaya and Tripura are yet to satisfy the population norm in case of PHCs and all the States but Arunachal Pradesh, Mizoram and Nagaland are yet to satisfy the population norm in case of CHCs.

The figures indicate that although there has been considerable progress in health centres after the implementation of NRHM in 2005, still the progress is not sufficient to provide health-care services to the growing population. In fact, there is acute shortage of health centres across the northeastern States (Table 4). For the country as a whole there is shortage of 20 percent of Sub-Centres, 24 percent of PHCs and 38 percent of CHCs. All the States except Mizoram have suffered acute shortage of one or the other health centres. The major concern is Assam, Sikkim and Tripura, which have suffered more than 50 percent shortages of CHCs. Therefore, in order to achieve the main goals of the NRHM,

there is need for establishment of more health centres, especially Sub-Centres and the existing health centres need to be upgraded to the next level.

Table 4
Shortfall in Health Centres (as on March 2011)

States	Sub-Centres	PHCs	CHCs
Arunachal Pradesh	27 (8.63)	+	+
Assam	1237 (21.18)	15 (1.57)	130 (54.62)
Manipur	72 (14.63)	+	3 (15.79)
Meghalaya	353 (46.57)	5 (4.39)	+
Mizoram	+	+	+
Nagaland	61 (13.35)	+	+
Sikkim	+	+	2 (50.00)
Tripura	41 (6.09)	27 (25.47)	15 (57.69)
All India	35762 (20.06)	7048 (24.13)	2766 (37.92)

Note: + indicates surplus. Figures within parentheses represent percentage.

The Shortfall of health centres is calculated as the difference between the required health centres (which is calculated using the prescribed population norms on the basis of Census 2011rural population) and health centre in-position.

Source: Bulletin on Rural Health Statistics in India, 2011.

Facilities available in Health Centres

Along with the progress in health centres, facilities available in the health centres are another important dimension of the health-care system. However, the condition of the northeastern states (except Mizoram) in this respect is poor. Table 5 reports the various facilities available in the health centres in the northeastern states vis-à-vis India as on 2011. While for the country as a whole only 55 percent Sub-Centres have ANM quarters, the figures are as low as 7.8 percent in Tripura, 17.2 percent in Nagaland, 40 percent in Arunachal Pradesh and no Sub-Centres in Manipur have ANM quarters. Even the quarters that are available are not used by the ANMs in

all the states but Arunachal Pradesh, Mizoram and Nagaland. All the states except Manipur have a better condition compared to the national average in terms of PHCs with labour room, whereas all the states but Mizoram and Tripura have an abysmal condition than the national average in terms of PHCs with Operation Theatre. The availability of regular water supply and electricity in the Sub-Centres and PHCs are not adequate across the northeastern states and most of the states have deplorable condition than the national level in terms of regular water supply and electricity. The unreliable electricity and water supplies take their toll to a greater extent on the performance of these centres.

Ironically, while the NRHM mission emphasises on integrating AYUSH (Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy) in the health-care system, none of the PHCs in Mizoram, Nagaland and Sikkim have AYUSH facility and only Manipur, Tripura and Meghalaya have more than national average (45.96 percent) of PHCs having AYUSH facility.

Turning to the facilities available in the CHCs, it is obvious that no CHC in any of the northeastern states except in Assam have all four specialists (surgeons, obstetricians & gynecologists, physicians and pediatricians). While none of the CHCs in Sikkim has quarters for specialist doctors; the percentage of CHCs with quarters for specialist doctors is very low for all other states except Manipur and Nagaland. Contrarily, though all the CHCs in Manipur have quarters for specialist doctors, but in none of the CHCs the specialist doctors live in quarters. In case of CHCs with functional operation theatre, Arunachal Pradesh, Manipur, Meghalaya and Tripura are below the all India average; whereas in case of CHCs with X-ray machine, Nagaland, Arunachal Pradesh and Assam are below the national level. In case of percentage of CHCs designated as FRU (First Referral Unit)[1], Assam, Manipur, Meghalaya and Tripura are below the national level. Further, none of the FRU in Arunachal Pradesh, Manipur and Tripura has blood storage facility.

While retaining the Indian Public Health Standards (IPHS) norms is important to maintain an acceptable standard of quality of health-care

1 An existing facility (district hospital, sub-divisional hospital, and/or CHC) is declared as First Referral Unit (FRU) if it is equipped to provide round-the-clock services for emergency Obstetric and new born care, in addition to all emergencies that any hospital is required to provide (GOI, 2011).

and to make the services more responsive and sensitive to the needs of people, only 18.38 percent of CHCs have been functioning as per the IPHS norms for the country as a whole and not a single CHC in any of the northeastern states except Meghalaya and Tripura have been functioning as per the IPHS norms. Even the CHCs functioning as per the IPHS norms in Meghalaya and Tripura are very small; only 3.4 and 9.1 percent respectively. Although the NRHM has focused heavily on child birth and pre-natal care, the child care and delivery facilities available in the CHCs are surprisingly poor. None of the CHCs in Arunachal Pradesh, Nagaland, Sikkim and Tripura have stabilisation units for the new born and, except Assam, the situation in the other states as well as the country as a whole are pitiable. Similarly, Arunachal Pradesh, Meghalaya and Tripura are below the national average (59.97 percent) in case of CHCs with new born care corner. The DLHS-3, 2007-08 reveals that none of the CHCs in Mizoram and Tripura have Obstetrician/Gynaecologist, while PHCs having Obstetrician/Gynaecologist in Manipur and Meghalaya are below the national average (25.2 percent). However, in case of 24 hours normal delivery services in CHCs the situation across the northeastern states is more or less at par with the national average.

Availability of sufficient number of beds in the health centres is a crucial requirement for the in-door patients. Although the IPHS norm recommends at least 4 to 6 beds in PHCs, percentage of PHCs with at least four beds in Arunachal Pradesh, Assam, Manipur and Tripura are below the national level (62.4 percent). Similarly, although the IPHS norm recommends at least 30 beds in CHCs, none of the CHCs in Arunachal Pradesh and Sikkim fulfils this norm (Table 5). The National Health Profile 2011 reveals that there are about 11993 government hospitals having 784940 beds in the country, of which 7347 hospitals (61.26 percent) are in rural area with 160862 beds (20.49 percent). The NER accounts for 587 rural government hospitals (8.0 percent) with 9285 beds (5.77 percent) (Table 6). All the northeastern states except Assam and Tripura are well ahead of the national average in terms of population served per rural government hospital and, all the states except Assam are in better condition than the national average in terms of population served per government hospital bed in the rural areas.

Table 5
Facilities available in Health Centres (as on March 2011)

	Arunachal Pradesh	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Sikkim	Tripura	India
Sub-Centres with ANM quarter (%)	39.9	55.2	0.0	99.0	94.6	17.2	95.2	7.8	55.0
Sub-Centres with ANM living in SC quarter (%)	100.0	19.9	0.0	42.6	100.0	97.1	20.9	32.7	60.8
Sub-Centres without water supply (%)	4.2	9.5	88.3	72.6	80.0	53.0	6.2	52.8	24.8
Sub-Centres without electric supply (%)	22.0	67.6	63.8	65.4	0.0	49.2	2.7	48.1	24.5
PHCs with Labour Room (%)	69.1	73.1	47.5	100.0	100.0	69.8	100.0	75.9	65.7
PHCs with Operation Theatre (%)	11.3	3.5	0.0	0.0	100.0	31.0	91.7	5.1	38.4
PHCs with at least 4 Beds (%)	60.8	54.5	23.8	100.0	100.0	97.6	100.0	58.2	62.4
PHCs without water supply (%)	29.9	41.8	68.8	11.9	100.0	15.9	0.0	15.2	12.5
PHCs without electric supply (%)	32.0	8.8	18.8	3.7	0.0	19.8	0.0	6.3	8.1
PHCs with AYUSH facility	15.5	40.3	90.0	49.5	0.0	0.0	0.0	67.1	46.0
CHCs with all four Specialities (%)	0.0	25.9	0.0	0.0	0.0	0.0	0.0	0.0	13.3
CHCs with quarters for Specialist Doctors (%)	6.3	NA	100.0	13.8	11.1	90.5	0.0	27.3	56.3

CHCs with Specialist Doctors living in quarters (%)	6.3	NA	0.0	13.8	11.1	90.5	0.0	0.0	41.8
CHCs with functional Operation Theatre (%)	77.1	93.5	43.8	20.7	100.0	100.0	100.0	27.3	87.1
CHCs with functional X-ray Machine (%)	27.1	55.6	75.0	62.1	100.0	14.3	100.0	72.7	58.5
CHCs with at least 30 Beds (%)	0.0	93.5	43.8	100.0	100.0	100.0	0.0	100.0	69.7
CHCs functioning as per IPHS norms (%)	0.0	NA	0.0	3.4	0.0	0.0	0.0	9.1	18.4
CHCs with Stabilisation Units for new born (%)	0.0	77.8	0.0	10.3	22.2	0.0	0.0	0.0	19.5
CHCs with New Born Care Corner (%)	16.7	100.0	75.0	41.4	100.0	100.0	100.0	45.5	60.0
CHCs having Obstetrician/ Gynaecologist (%) #	34.2	31.3	15.8	11.5	0.0	NA	NA	0.0	25.2
CHCs having 24 hours normal delivery services (%) #	89.5	91.6	84.2	96.2	90.0	NA	NA	100.0	90.0
CHCs designated as FRUs (%) #	65.8	32.5	31.6	46.2	70.0	NA	NA	25.0	52.0
FRUs having blood storage facility (%) #	0.0	25.9	0.0	16.7	85.7	NA	NA	0.0	9.1

Notes: NA - Data not available. # Data from DLHS-3 (2007-08).

Source: Bulletin on Rural Health Statistics in India, 2011 and District Level Household and Facility Survey (DLHS-3), 2007-08.

Table 6
Number of Beds in Government Hospitals (including CHCs) in Rural Areas

States	No. of Rural Govt. Hospitals	No. of Beds in Rural Govt. Hospitals	Average Rural Population (2011) served per Govt. Hospital	Average Rural Population (2011) served per Govt. Hospital Bed	Reference Period
Arunachal Pradesh	146	1356	7323	788	01-01-2009
Assam	108	3240	247968	8266	01-01-2010
Manipur	217	664	8754	2861	01-01-2012
Meghalaya	29	870	81689	2723	01-01-2011
Mizoram	20	770	26452	687	01-01-2012
Nagaland	23	705	61168	1996	01-01-2010
Sikkim	30	730	15199	625	01-01-2012
Tripura	14	950	193575	2853	01-01-2011
India	7347	160862	113392	5179	01-01-2012

Source: National Health Profile 2011.

Availability of Health Workers

The health workers are the heart of the health systems. Their availability is one of the important prerequisites for the efficient functioning of the care system. However, the condition of the region in case of manpower in health centres is mixed. Table 7 shows the status of health manpower in the northeastern states vis-à-vis India as on March 2011. It is evident that just a little less than two-thirds of the PHCs in India has been functioning with only one doctor. The percentages are even high for Meghalaya, Mizoram and Nagaland. Similarly, only one-fourth of PHCs have more than two doctors for the country as a whole and only Arunachal Pradesh, Assam, Sikkim and Tripura are in better position than the national level in this regards. Although the percentage of PHCs having lady doctors is higher than the national average (20.86 percent) in all the states except Arunachal Pradesh and Nagaland, but except for Sikkim and Manipur the

figures are not satisfactory for the other states. The lack of lady doctors in the health centres has led to low turnout of female patients in these centres as they may not feel comfortable to discuss certain health issues with male doctors. Therefore, urgent steps need to be undertaken by the government in order to increase the number of lady doctors in the health centers.

Looking at the average rural population (Census 2011) covered by various health workers (Table 7) it is obvious that all the northeastern states except few are above the all India average in terms of average population covered by a doctor, a pharmacist, a nurse, a female health worker and a male health worker; whereas the position of the states are mixed in terms of average population covered by a female health assistant, a male health assistant and a radiographer. All the states but Nagaland are far below the national level in terms of population covered by a specialist.

One of the major problems confronting the rural health-care sector of the region is shortage of health workers. Table 8 reports that India suffers shortages of 12 percent doctors, 64 percent specialists, 23 percent nurse, 22.5 percent pharmacists, 53.9 percent radiographers, 64.7 percent male health workers, 37.8 percent female health assistants and 41.6 percent male health assistants in 2011. All the northeastern states have suffered shortages of one or the other forms of health workers. More seriously, all the northeastern states are suffering from severe shortage of specialist doctors and radiographers in CHCs. Arunachal Pradesh, Meghalaya, Mizoram and Nagaland have been experiencing shortage of doctors in PHCs. There is shortfall of nursing staff in the PHCs and CHCs of Arunachal Pradesh and Sikkim, whereas Arunachal Pradesh, Mizoram, Nagaland and Sikkim have shortages of pharmacists in PHCs and CHCs. All the states have shortage of male health workers, male health assistants and female health assistants. The large shortfall in male health workers and health assistants is a serious concern, as it might result in poor male participation in family welfare and other health programmes and overburdening of the female health workers/ANMs, which further result in underperformance of these workers.

In addition to the shortage of health workers, the health-care system in India is overwhelmed by large scale absenteeism and low level of participation in providing health-care services among the existing health workers, especially in the rural areas (Hammer et al., 2007 and Bhandari and Dutta, 2007). There is general reluctance among the health workers to

be located in the interior rural areas and, when appointed in these areas, they choose to remain absent. Chaudhury et al. (2003) conducted a survey on absenteeism among teachers and health workers in several countries and found that absenteeism among the primary health providers is the highest in India (40 percent) among the surveyed countries and, amongst the selected 19 states of India, absenteeism is highest in Assam (58 percent).

The acute shortage of health workers and large scale absenteeism among the existing health workers results in under-utilisation or non-utilisation of the available healthcare infrastructure and facilities and, therefore, affects access to adequate healthcare services. Therefore, emphasis should be given not only to build as many health centres and provide health-care facilities therein, but also to ensure availability of well trained health workers in the health centres.

Accessibility of the Health-care Facility

Along with the availability of physical infrastructure, facilities and health workers, accessibility of health-care services is important for improving health of the people. The health-care facilities have to be accessible within safe physical reach to everyone at affordable cost without discrimination. However, the accessibility of health-care services within safe physical reach across the northeastern states is not quite satisfactory. The District Level Household and Facility Survey (DLHS-3), 2007-08 reveals that just above 71 percent villages in India have Sub-Centres within 3 kilometers and have PHCs within 10 kilometers, about 60 percent of villages have Accredited Social Health Activist (ASHA) and 73.7 percent villages have beneficiary under Janani Surasksha Yojana (JSY). In case of the NER, the survey reveals the following: (a) percentage of villages with Sub-Centres within 3 kilometers in Arunachal Pradesh, Manipur, Meghalaya and Mizoram is below the national level; (b) percentage of villages with PHC within 10 kilometers is below the national level in all the states except Tripura; (c) percentage of villages having ASHA is above the national level in all the northeastern states; and (d) percentage of villages having beneficiary under JSY in Arunachal Pradesh, Manipur, Meghalaya and Mizoram is below the national level (Table 9).

When compared with the national level average, the connectivity of the Sub-Centres and PHCs in the northeastern states with motorable roads is pitiable. The connectivity of PHCs in Assam and Sikkim is little better (Table

10). However, the percentage of CHCs with referral transport facility is above the national level in all the northeastern states, barring in Arunachal Pradesh.

Given these facts and whatever we have discussed in the previous sections, it can be said that the access to health-care facility in the rural areas across the northeastern states is limited by dysfunctional physical infrastructure, lack of equipment, lack of adequate health workers, lack of electricity, and lack of proper road connectivity, etc.

Safety and Acceptability

The safety of health-care services provided to the patients is another important dimension that determines the quality of the health-care system, which in turn determines the acceptability of the health-care services by the people. Unless a minimum level of safety and quality is ensured by the health-care system, people will be reluctant to use these services. However, defining quality of health-care services is difficult, as it is a complex construct capturing several paradigms such as safety, effectiveness, timeliness, patient-centeredness etc.

Constrained by data, we have considered three indicators relating to institutional delivery to capture safety and acceptability of public health-care services. As delivery is very critical and more sensitive than any other illness, using the health-care services for this purpose implies both the safety and acceptability of the health-care services to a greater extent. However, the indicators are not quite satisfactory for the country as a whole as well as in all the northeastern states. The DLHS-3, 2007-08 reveals that for the country as a whole the rate of institutional delivery is only 40 percent, while rate of safe delivery is about 43.6 percent and only 50 percent PHCs have conducted at least 10 deliveries during the last month (Table 11). The rate of institutional delivery and safe delivery in Assam and Meghalaya are below the national level, while the other states are just a little above the national level in at least one of these indicators. This suggests that the acceptability rate of the public health-care services in the northeastern states as well as for the country as a whole is very low. Extensive efforts need to be made to ensure the safety of health-care services provided by the public health-care system to improve its acceptability. In view of such findings, we can conclude at the abstract that the quality of health-care services delivered in rural areas across the north-eastern States may not be as high as one would expect.

Table 7
Status of Manpower in PHCs and CHCs (as on March 2011)

States	Percentage of PHCs			Average Rural Population (Census 2011) covered by a								
	with 2 doctors	with 1 doctor	with lady doctor	Doctor * at PHCs	Total Specialist [$] at CHCs	Radiographer at CHCs	Pharmacists at PHCs & CHCs	Nurse at PHCs & CHCs	Health Worker (F)/ ANM at SCs & PHCs	Health Worker (M) at SCs	Health Assistant (F)/LHV at PHCs	Health Assistant (M) at PHCs
Arunachal Pradesh	34.02	49.48	20.62	11621	1069165	118796	19092	3649	2707	7224	NA	13707
Assam	46.16	32.09	36.99	17200	123984	439025	21221	9416	3070	11224	59249	NA
Manipur	7.50	0.00	60.00	9894	474906	146125	14071	3309	2874	5936	26384	26022
Meghalaya	13.76	84.40	29.36	22779	263219	107681	16683	5722	3010	17812	29987	34333
Mizoram	5.26	77.19	28.07	14298	264519	88173	16031	2019	855	1701	44086	58782
Nagaland	16.67	69.05	12.70	13929	41378	1406861	12561	4658	1551	3553	87929	93791
Sikkim	58.33	41.67	75.00	11691	#	455962	45596	14249	1562	3328	25331	35074
Tripura	39.24	30.38	36.71	22774	#	387150	23363	6896	6159	9509	387150	150558
All India	25.89	62.18	20.86	31641	120128	375096	33768	12749	4008	15955	52369	53328

Note: * Allopathic Doctors.

[$] Specialists includes Surgeons, Obstetricians & Gynaecologists, Physicians and Pediatricians.

No specialist doctor.

NA – Not available.

Source: Bulletin on Rural Health Statistics in India, 2011.

Table 8
Shortfall in Health Workers (as on March 2011)

States	Health Worker (F)/ ANM at SCs & PHCs	Health Worker (M) at SCs	Health Assistant (F)/LHV at PHCs	Health Assistant (M) at PHCs	Doctor at PHCs	Total Specialist at CHCs	Radiographer at CHCs	Pharmacists at PHCs & CHCs	Nursing Staff at PHCs & CHCs
Arunachal Pradesh	+	138 (48.25)	NA	19 (19.59)	5 (5.15)	191 (99.48)	39 (81.25)	89 (61.38)	140 (32.33)
Assam	+	2218 (48.18)	486 (51.81)	NA	+	216 (50.00)	47 (43.52)	+	+
Manipur	+	100 (23.81)	8 (10.00)	7 (8.75)	+	60 (93.75)	3 (18.75)	+	+
Meghalaya	+	272 (67.16)	30 (27.52)	40 (36.70)	5 (4.59)	107 (92.24)	7 (24.14)	+	+
Mizoram	+	59 (15.95)	45 (78.95)	48 (84.21)	20 (35.09)	34 (94.44)	3 (33.33)	33 (50.00)	+
Nagaland	+	0 (0.00)	110 (87.30)	111 (88.10)	25 (19.84)	50 (59.52)	20 (95.24)	35 (23.81)	+
Sikkim	+	9 (6.16)	6 (25.00)	11 (45.83)	+	8 (100.0)	1 (50.00)	16 (61.54)	6 (15.79)
Tripura	271 (38.12)	347 (54.91)	72 (91.14)	61 (77.22)	+	44 (100.0)	4 (36.36)	+	+
All India	6555 (3.81)	95909 (64.75)	9036 (37.83)	9935 (41.59)	2866 (12.00)	12301 (63.95)	2593 (53.92)	6444 (22.46)	13262 (23.04)

Notes: + indicates surplus. NA- Data not available. Figures within parentheses represent percentage.
The Shortfall of manpower is calculated as the difference between the required manpower (which is calculated using the prescribed population norms on the basis of Census 2011rural population) and manpower in-position.

Source: Bulletin on Rural Health Statistics in India, 2011.

Table 9
Accessibility of the Health-care Facility

States	Villages with Sub-Centre within 3 kms (%)	Villages with PHC within 10 kms (%)	Villages having ASHA (%)	Villages having beneficiary under JSY (%)
Arunachal Pradesh	47.1	41.6	69.8	55.0
Assam	83.2	68.3	86.0	85.8
Manipur	51.0	65.6	72.5	31.0
Meghalaya	52.5	56.9	77.9	31.4
Mizoram	69.4	28.6	69.4	72.2
Nagaland	NA	NA	NA	NA
Sikkim	77.1	55.3	79.2	87.7
Tripura	80.6	78.9	88.6	76.0
All India	71.4	71.2	60.1	73.7

Note: NA-Data not available.
Source: District Level Household and Facility Survey (DLHS-3), 2007-08.

Table 10
Connectivity with the Rural Health Centres

States	Sub-Centres without all-weather motorable approach road (%)	PHCs without all-weather motorable approach road (%)	CHCs with referral transport available (%)
Arunachal Pradesh	33.2	11.3	83.33
Assam	15.0	3.1	100.00
Manipur	27.4	15.0	100.00
Meghalaya	18.0	54.1	100.00
Mizoram	18.6	100.0	100.00
Nagaland	33.3	12.7	100.00
Sikkim	17.1	4.2	100.00
Tripura	31.3	63.3	100.00
All India	6.9	6.6	88.79

Source: Bulletin on Rural Health Statistics in India, 2011.

Table 11
Rate of Institutional Delivery in Rural Areas

States	Institutional Delivery (%)	Safe Delivery (%) #	PHCs conducted at least 10 deliveries during last month (%)
Arunachal Pradesh	42.5	43.8	7.7
Assam	32.0	37.6	81.3
Manipur	33.8	48.1	14.3
Meghalaya	20.6	25.2	62.7
Mizoram	40.4	50.7	29.7
Nagaland	NA	NA	NA
Sikkim	48.0	55.1	18.2
Tripura	41.6	42.7	43.6
All India	37.9	43.6	49.9

Note: NA- Data not available. # Either institutional delivery or home delivery attended by skilled health personnel (Doctor/ANM/Nurse/midwife/LHV/Other health personnel).
Source: District Level Household and Facility Survey (DLHS-3), 2007-08.

Sanitation Facility and Access to Safe Drinking Water

Sanitation and safe drinking water plays vital role in maintaining good health of the people. Recognising its importance the NRHM has emphasised on universal access to safe drinking water, sanitation & hygiene, and in this direction it has proposed to constitute Village Health and Sanitation Committee (VHSC) in each village. As per the DLHS-3, 2007-08 all the northeastern states are better than the national level in case of households with toilet facility (Table 12). However, in case of households having access to improved sources of drinking water all the northeastern states except Arunachal Pradesh and Sikkim are below the national level. Similarly, the percentage of villages in Arunachal Pradesh, Assam, Manipur and Meghalaya where VHSCs exist is less than the national figure. Therefore, efforts need to be made to constitute VHSC in more and more villages and financial support should be given to them in order to promote household toilets and provide safe drinking water facility.

Table 12
Sanitation Facility and Access to Safe Drinking Water in Rural Areas

States	Households with Toilet facility (%)	Households with Improved source of drinking water (%)	Village where Health and Sanitation Committee formed (%)
Arunachal Pradesh	87.0	91.9	2.2
Assam	66.2	72.9	11.0
Manipur	95.6	25.8	25.8
Meghalaya	61.6	45.3	26.4
Mizoram	97.2	68.2	88.2
Nagaland	NA	NA	NA
Sikkim	91.5	93.8	35.2
Tripura	92.6	55.3	46.3
All India	34.1	79.6	28.7

Note: NA- Data not available.
Source: District Level Household and Facility Survey (DLHS-3), 2007-08.

Conclusion

The health-care system in India has remained unsatisfactory even after six decades of planned development in the country. The NRHM (2005-2012) launched by the Government of India in 2005 has made considerable progress in health-care infrastructure in the country, but the improvement has been quite uneven across regions with large-scale inter-state variations. Accessibility to health-care services is extremely limited in many rural areas and backward regions of the country. In this context, this paper has examined the current status of public health infrastructure in the rural areas of the northeastern region of India.

We found that there has been significant improvement in the rural health-care infrastructure in the region, especially in case of health centres after the implementation of NRHM in 2005. Although the northeastern states are in better position compared to the national level in terms of progress in physical infrastructure, many of the states are yet to satisfy the existing population coverage norms in one or the other types of health

centres. Besides the health centres in many states are not well equipped with essential facilities and equipment such as labour rooms, operation theatres, stabilisation units and care corners for new born babies, electricity supply, water supply, X-ray machine, telephone connectivity, etc.

More importantly, the rural health-care sector in the NER suffers from shortages of well trained health workers; be it specialist doctors, nurses or other health workers. Even though the posts of various cadres of health workers are sanctioned, many of them are lying vacant in almost all the states, resulting in under-utilisation of facilities available in the existing health centres and, subsequently, closure of those facilities. The accessibility of public health-care facilities within safe physical reach is a challenge in rural areas across all the north-eastern states. In terms of sanitation facility, the northeastern states are better than the national level, but in case of access to improved sources of drinking water, all the north-eastern states but Arunachal Pradesh and Sikkim are below the national level.

All these issues take their toll on the performance of rural health-care services delivery mechanism. Given these bottlenecks, it can be said that the health-care services in the rural areas across the northeastern states is not of high quality, which further has its toll on the performance of the region in achieving the basic health indicators. Therefore, there is urgent need for rigorous efforts to strengthen the rural health-care sector in the region. Keeping the difficulties of improving the healthcare system in mind, a roadmap needs to be prepared in order to prioritise the key areas. The state governments should undertake more direct policies towards establishment of new health centres, especially Sub-Centres and upgrading the existing centres to the next level. Besides, the existing health centres must be adequately staffed with well trained health workers and must be well equipped with essential facilities and equipment.

References

Baru, R., Acharya, A., Acharya, S., Shiva Kumar, A.K. and Nagaraj, K. (2010): "Inequities in Access to Health Services in India: Caste, Class and Region", *Economic and Political Weekly*, 45(38): 49-58.

Bhandari, L. and Dutta, S. (2007): "Health Infrastructure in Rural India", in P. Kalra and A. Rastogi (eds) *India Infrastructure Report 2007*, New Delhi: Oxford University Press.

Chaudhury, N., Hammer, J.S., Kremer, M., Muralidharan, K. and Rogers, F.H. (2003): "Teacher and Health-care Provider Absenteeism: A Multi-Country Study", World Bank: Washington, D.C.

Government of India (2005): Report of the National Commission on Macroeconomics and Health, Ministry of Health and Family Welfare, Government of India, New Delhi.

Government of India (2011): Bulletin on Rural Health Statistics in India 2011, Ministry of Health & Family Welfare, Government of India, New Delhi.

Government of India (2012a): National Health Profile 2011, Ministry of Health & Family Welfare, Government of India, New Delhi.

Government of India (2012b): Economic Survey 2011-12, Planning Commission, Government of India, New Delhi.

Hammer, J.S., Aiyar, Y. and Samji, S. (2007): "Understanding Government Failure in Public Health Services", *Economic and Political Weekly*, 42(40): 4049-4057.

Hazarika, I. (2013): "Health workforce in India: assessment of availability, production and distribution", *South-East Asia Journal of Public Health*, 2(2): 106-112.

IIPS (2010): District Level Household and Facility Survey (DLHS-3), 2007-08: India: Key Indicators: States and Districts, International Institute for Population Sciences, Mumbai.

Kumar, J.R. (2013): "Role of Public Health Systems in the Present Health Scenario: Key Challenges", *Indian Journal of Public Health*, 57(3): 133-137.

Saikia, D. (2012): "Introduction: India's Economy after Liberalisation", in D. Saikia (eds) *Indian Economy after Liberalisation: Performance and Challenges*, New Delhi: SSDN Publication.

World Bank (1993): *World Development Report 1993: Investing in Health*, New York: Oxford University Press.

*****

** *The authors are thankful to anonymous referee for helpful comments and suggestions. The usual disclaimer applies.*

*****