

# Assessment of Future Manpower Requirements in Public Healthcare of India and its Northeastern Region

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## ABSTRACT

Health-care workforce planning is crucial for active healthcare provision and to achieve an improvement in population health. One of the major challenges in the quest for achieving the goals of the Universal Health Coverage is the shortage of skilled health workers which is a matter of concern for health planners. The paper attempts to project the future requirement of allopathic physician practicing in public sector for India and Northeast India using the health information data from the Datanet India (Indiastat). The projection of physician was done using the average doctor to physician ratio for the year 2004–2017 and population projection was derived using the average exponential growth rate. Study found that with the current trend, India and Northeast are still far from meeting the healthcare needs of the population and the shortage of allopathic physician in public sectors will continue to persist in future. Under the current scenario, India will have require close to 1.6 million public sector allopathic doctors in 2030 to keep up with the WHO standard population to physician ratio. Northeast India will need 0.05 million to achieve the same standard. It could be expected that public health workforce in India and Northeast will remain insufficient in the future and this may have serious implication to the poor and vulnerable section of the population and therefore calls for a need to have a strong build-up and development in Indian health-care system.

**Keyword:** Allopathic, Northeast India, Physician, Population, Projection, Requirement  
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## INTRODUCTION

Indian healthcare has been an instrumental catalytic agent for improvement in the health status of the Indian population in the last 70 years. India has experienced a sharp decline in the death rates along with the substantial gain in the life expectancy in the past decades with the dropping disease burden and rising healthy life span over time.<sup>[1,2]</sup> Apart from improving public health and social determinants of health, healthcare is another important factor that contributes to better health conditions and increasing life expectancy of the population. Although India's current achievement of decent health status has come a long way but strictly speaking, it is far from having a dignified health status. Study on healthy life expectancy showed that healthy life expectancy of Indian men increased only 6.4 years from 1990 to 2013, and for women, it increased by 8.9 years. The slow growth of healthy life expectancy illustrate that India is experiencing longevity but in absence of healthy and active one. The magnitude of burden of diseases in India is disproportionately high, data explained that India still contributes 20% to the global burden of disease where more than half of it is non-communicable diseases.<sup>[3]</sup> Furthermore, the Healthcare Access and Quality Index which is based from causes that should not be fatal in the presence of effective medical care (i.e., amenable mortality) is 44.8 for India which is lower than the overall average of South Asia level of 44.4 and considerably lower than that of China (74.2) and Srilanka (72.8) and slightly lower than Bangladesh (51.7), Nepal (50.8), and marginally higher than Pakistan(43.1).<sup>[4]</sup> Recently, a study revealed that in 2016 more than 50% of all wasted children and 40% of the stunted children in the world reside in South and half of the women in the reproductive age group in India suffer from anemia.<sup>[5]</sup> Undoubtedly India's health standard is improving; however, this improvement is not uniform at all levels, reports have suggested that there exist a staggeringly high health disparities between the rural and urban areas. National Family Health Survey data reveals that IMR in rural areas is 1.6 times

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that of urban India in 2015–16 with 29 per 1000 live births in urban and 46 in rural areas. In October 2010, the Planning Commission of India constituted a 15 member High Level Expert Group (HLEG), to recommend a framework for Universal Health Coverage (UHC). The vision of HLEG is to ensure equitable access for all Indian citizens, resident in any part of the country, regardless of income level, social status, gender, caste or religion to affordable, accountable, and appropriate health services of assured quality (Promotive, preventive, curative, and rehabilitative). The increasing burden of non-communicable diseases, infectious and maternal-child diseases in India joined with the poor implementation of public health programs and other preventive measures are major health concern in India. Recently, the WHO has emphasized that India should reorganize its healthcare delivery system with the right mix and distribution of services to achieve Universal Health Coverage (UHC) and further stressed on the need to strengthen both the quantitative and qualitative human resources in the Indian health-care system.<sup>[6]</sup> One of the major challenge in the quest for achieving the goals of the Universal Health Coverage is the imbalance

between the population and health professionals in the country which apparently arise right from the health-care planning stage.

India has a mixed health-care system where public, private and recent collaboration of both public and private under public-private partnership model serve as the three channels of health-care providers in the country. Public health-care delivery in rural areas works under the three tier system corresponding to the population of the region beginning from subcenter to primary healthcare and community health care. Subcenters are anticipated to cater a population of around 3000-5000 and Primary Health Centres (PHC) action of about 20,000–30,000. Community Health Centers (CHC) are the other tier of rural healthcare institutions which accommodates to providing services to a population of about 80,000–1,20,000.

Modern medicine or allopathy is the popular type of healthcare treatment in India by far. It is well known for its technological advancement and effectiveness in faster prevention and cure of infectious diseases and emergencies related health problems. In terms of health workforce, Allopathic doctors constitute around 30.6% of the total health workforce in 2001 while Ayurvedic doctors constitute only 5.3%, Homeopathic doctors comprise 3.2% and Unani doctors only 0.5% while nurses and midwives constitute 30.5%. The density of allopathic doctors per lakh population in urban areas was 133.5 while in rural areas it was only 33.7. The ratio of urban all health workers to their rural counterpart is 3.8 whereas the same ratio for allopathic doctors is 4. Among all the doctors, 77.2 % are allopathic doctors at the national level and all NE states have more than 70% allopathic doctors except in the case of Tripura which comprised 58.3% allopathic doctors among all the doctors.<sup>[7]</sup> According to Census India 2001, state wise proportion of allopathic doctors, Sikkim (0.04%), Arunachal Pradesh (0.5%), Nagaland (0.11%), Manipur (0.17%), Mizoram (0.06%), Tripura (0.16), Meghalaya (0.09%), and Assam (1.19%). Although it is well understood that India and its least developed northeast region will have shortage of health manpower, it is important to quantify the future requirements of health workforce primarily in the areas where majority of the population rely for healthcare. One of the major causes that cripple Indian health-care system is the acute shortage of qualified medical professionals, and unfortunately, this problem is more severe in the rural areas. The policy makers for public healthcare in their health-care development plan should have an estimate for the future supply and demand of health workforce. It is essential to ascertain the future requirements of health workers and to cater the healthcare needs of the future population; it is also equally important to lessen the inequalities in the future healthcare delivery across different regions or sectors. Effective workforce planning for healthcare will be able to develop an equilibrium scenario for demand and supply of health workers if there is prior knowledge about the future requirement of health workers. The demand of health professional naturally depends on the growth and structure of population, socio-economic conditions, expansion of health coverage and supply largely depends on the commitment of policy makers through strategic planning, healthcare spending, number of graduates from medical institutions. India needs a strong health-care planning which can envisage the future health scenario and keep up with the future demand of human resources.

## NEED FOR THE STUDY

For achieving inclusive development and economic prosperity, India's population needs to be healthy and productive. A healthy

population is crucial for the economic progress and development of the country. To achieve a satisfactory health status, more attention is needed to develop in areas such as public health and health-care delivery system. The Indian health-care delivery system today come across notable hurdles such as rising population, changing age structure, increasing the prevalence of non-communicable diseases, regional disparities, soaring healthcare cost, etc., which if unchecked may prove catastrophic in future. With the enormity of India's population, health-care delivery needs effective planning and must include strategies to develop key aspects of healthcare and to improve and strengthen the public health-care set up. India's healthcare are confronted with lack of health workforce and inefficient health professionals which advocate the need to address the various shortfall in public healthcare and strengthen the human resource and capacity building of health workers.<sup>[8]</sup> Several studies have highlighted the impairment in the healthcare system in India where they have underscore that the geographical mal distribution and imbalance in the skill-mix health workers are some of the causes which truncate the quality care services.<sup>[9,10]</sup> Some studies have accentuate the aggravated insufficiency in health-care services in rural parts of India and NE India and furthermore underline the absence of quality services is primarily due to shortage of specialize health professionals.<sup>[11-14]</sup> Although it is well understood that India and its least developed northeast region is currently having shortage of health manpower, largely the seriousness of the problem have not been much ascertain quantitatively. Therefore, it is important to quantify the future requirements of health workforce primarily in the areas where majority of the population rely for healthcare. Recognizing the importance of well-developed health-care workforce planning is important to envisage quality services in future. For better healthcare planning, it is essential to understand to quantify the future needs in health workforce for achieving a quality health-care services. These estimates would be valuable to endeavor future healthcare planning and serves as an aid for logical policy decisions. There are limited number of studies which quantify the future requirements of health workers predominantly working in public health-care system in India and NE India which is another rationale for undertaking the study. The objective of the study is therefore to assess the available health workers particularly those working in the public sector and to project the future requirements of public health workers.

## MATERIALS AND METHODS

To obtain the year wise number of allopathic doctors in India and Northeast from the year 2004 to 2017, India stat website was used (<http://www.indiastat.com>) which provide secondary level data of state wise number of allopathic doctors working in government agencies. Census of India data from 1971 to 2011 were used for projection of population. We have used the 4<sup>th</sup> wave of District Level Household and Facility Survey (DLHS-4) to study the variation in availability of health facilities and manpower in northeast region (excluding Assam) and other states of India. Apart from other information's on maternal and child health, DLHS4 also collected information on infrastructure, manpower, equipment's, drugs, and services of public health. Population projection was done using the exponential average annual population growth rate. Projection of government allopathic physician was done using the actual physician to population ratios and the standard ratio of 1:1000; according to the High Level Expert Group (HLEG) for Universal Health Coverage constituted by the Planning Commission. The

difference between the projected physicians (standard ratio and the actual ratio) gives us the number of physicians required in India and Northeast.

### RESULTS

From the Census 2001 data, it is understood that the distribution of overall physician is skewed toward urban areas in India and all the Northeastern states of India [Figure 1]. Although rural comprise close to 70% of India's population, only 39% of the total physician are available at their disposal and the disproportion is vastly increasing in NE as only close to 39% of the physician provide services to around 82% of the population in the region. Since health-care in India is a state affair, there is a vast difference in health-care services among the different states which largely depend on the per capita public health spending of the state governments. State wise imbalance between the urban-rural distributions of physician is found to high in Mizoram and Meghalaya. The situation is worse in rural Meghalaya where for 80% of the population in the state only 18% of the state physician are available to their vicinity for health-care services. Almost all Northeastern states have rural population above than 70% except Mizoram which comprises only 48% of the rural population. According to the study done by Fan and Anand in 2016, 59.2% of all health workers in India were found in urban areas with the urban health worker density of 423.8 per lakh and around 40.8% were located in rural areas with the rural health worker density of 113.7 per lakh population. The data clearly explain the acute uneven distribution of health workers that exist in the country. Most of the villages in Northeast India have lesser number of health workers as compared to the villages in other major states of India [Figure 2]. Vast majority of the villages in India and NE have Accredited Social Health Activist (ASHA) which work as an interface between the community and the public health system. Ministry of Health and Family Welfare (MohFW) under the government of India has recognized shortage of trained medical manpower and absence of improved quality of health services as two of major problems that cripples health sector in northeast India and have included the region the National Rural Health Mission (NRHM) in its effort to provide equitable, affordable, and quality healthcare to the rural population together with the EAG states of India in 2005. In spite of government efforts to develop healthcare infrastructure in northeast through the scheme "Forward linkages for NRHM in Northeast," still greater proportion of the villages in the region does not have enough health manpower [Figure 2]. The lack of development in health sector in NE India can well be understand by the average distance of villages from health facilities as depicted in Figure 3 where the mean distance to health-care facilities are higher in northeast as compared to other major states of India. The average distance to the nearest health facility is higher in NE India could be the implication of lack of healthcare infrastructure in the remote district of the region.<sup>[15]</sup> The scarcity of health facilities in northeast could be relate to low development in the region which is geographically isolated and absence of equipped transport and communication, infrastructures and others. Another reason for poor health status in NE India especially in states such as Assam and Meghalaya could be due to the shortage of infrastructural facilities, in some cases though available but not functioning and sometimes not easily accessible.<sup>[16]</sup> The health-care situation in the country is not in good shape particularly in the public healthcare where most of the rural and economically weaker population rely

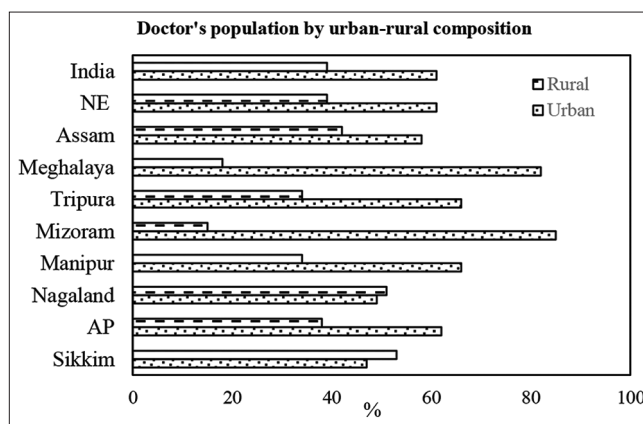


Figure 1: Distributuion of doctor's population by urban-rural areas source: Census India 2001

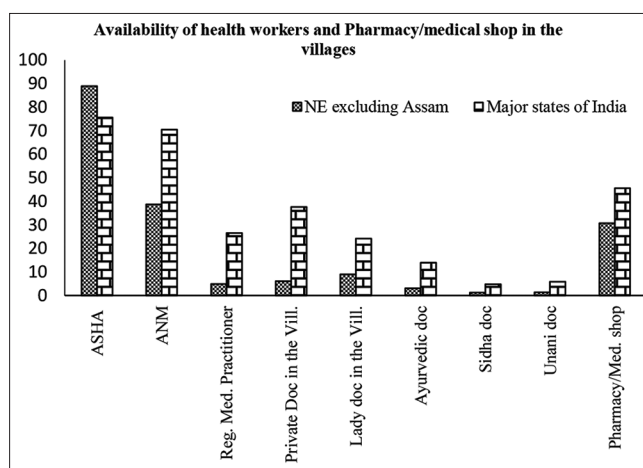


Figure 2: Villages with health workers and Pharmacy/medical shop. Source: DLHS 4

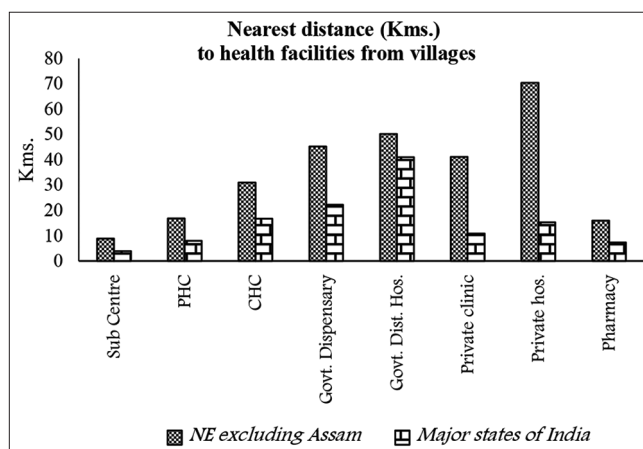


Figure 3: Average distance of nearest health facilities from villages. Source: DLHS 4

upon. India's 1.3 billion population is currently being catered by the service of only 1.02 million allopathy doctors and with only 11% of them working in the public healthcare. The problem is more worse in rural areas having lesser manpower coupled with skill deficiency workforce and large demand for services.<sup>[17]</sup>

With the positive approach of the government in its 5 year development plans, the focus on priorities for human development in health sector from ninth 5 year onwards has seen an improvement in the number and quality of health workers working to meet the healthcare needs in the country. There is a significant rise in the number of government allopathic physician in India from 2001 to 2011 which recorded up to 116% and is much higher than the growth rate of population which is 17.72%. The number of government allopathic physician in Northeast India however increased by 49% as compared to that of population which has a 17.79% increase from 2001 to 2011. The physician to 1000 population ratio in India and Northeast seems to follow similar trend with Northeast having higher ratios than that of India on the account of low population density in NE India. The physician to 1000 ratios is fluctuating over time in both India and the Northeast and does not regularly follow any systematic pattern. It is noted that India has seen a jump in the ratios from 2011 onwards whereas Northeast began to increase from 2010 onwards [Table 1]. The government allopathic physician to 1000 population ratios according to the year 2011 was 0.081 in India and 0.166 in Northeast India meaning that there is around 12400 population to one government allopathic physician in India and 6035 population to one government allopathic physician in Northeast India.

The projected physician is obtained after applying the average increment in the ratios from 2004 to 2017 to the projected population for the year 2018–2030. The projected number of physician as per the HLEG standard ratio is estimated by applying the standard ratios to the projected population. Figures 2 and 3 show the levels and trend of the estimated number of physicians for India and Northeast. The difference between them gives us the number projected number of physician required for the same projected years. The difference between the estimated number of government allopathic physicians in India between the standard method and the actual average ratio method is 1140% as in 2011 whereas it was around 503 percent in Northeast India and this difference is expected to decline to 840% in India and 362% in Northeast India in the year 2030.

The gap between the demand and supply of government allopathic physicians will persist so long unless the government adopts new health policies which can increase the physician production. Based on this method, India, will have 1.57 million shortage of government allopathic physician if it is to depend whole in public sector and Northeast India will require 0.05 million government allopathic physician if it is to depend whole in public sector for healthcare [Table 2]. The difference between the projected requirements of physician for 2018–2030 for India

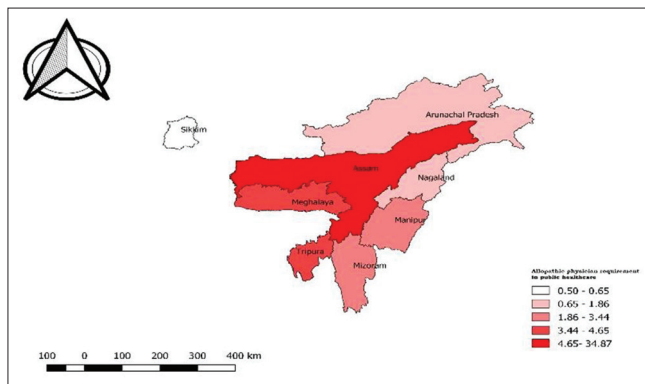
**Table 1:** Population and govt. physician in India and northeast 2004–2017

Year	India			Northeast India		
	Population (million)	Govt. Physician ('000)	Physicians to 1000 population ratio	Population (in million)	Govt. Physician ('000)	Physicians to 1000 population ratio
2004	1095	N/A	N/A	42	5	0.130
2005	1119	77	0.069	43	N/A	N/A
2006	1142	74	0.064	44	6	0.133
2007	1167	77	0.066	45	5	0.117
2008	1191	85	0.071	46	5	0.118
2009	1217	85	0.070	47	5	0.113
2010	1242	85	0.069	48	7	0.149
2011	1211	98	0.081	46	8	0.166
2012	1235	115	0.094	47	8	0.170
2013	1260	107	0.085	48	8	0.168
2014	1285	N/A	N/A	49	N/A	N/A
2015	1311	106	0.081	50	8	0.167
2016	1337	107	0.080	51	8	0.165
2017	1364	113	0.083	52	9	0.166

**Table 2:** Projected Population and govt. physician in India and northeast 2018–2030

Year	India				Northeast India			
	Projected Population (million)	Projected Physician by standard ratio ('000)	Projected Physician by current ratio ('000)	Requirement	Projected Population (million)	Projected Physician by standard ratio ('000)	Projected Physician by current ratio ('000)	Requirement
	1	2	3	4=2-3	5	6	7	8=6-7
2018	1391	1391	118	1273	53	53	9	44
2019	1419	1419	123	1296	54	54	9	45
2020	1447	1447	128	1319	55	55	10	46
2021	1476	1476	133	1343	57	57	10	46
2022	1506	1506	139	1367	58	58	11	47
2023	1536	1536	144	1392	59	59	11	48
2024	1567	1567	150	1417	60	60	12	49
2025	1598	1598	156	1442	62	62	12	50
2026	1630	1630	162	1468	63	63	13	50
2027	1663	1663	168	1495	64	64	13	51
2028	1696	1696	174	1521	66	66	14	52
2029	1730	1730	181	1549	67	67	14	53
2030	1764	1764	188	1577	69	69	15	54





**Figure 4:** Projected requirement of allopathic physician in public healthcare of NE states India (Author's calculation)

is 24% and for Northeast is 22%. Among the NE states, the future requirement of allopathic physicians for public healthcare will be higher in states like Assam, followed by Meghalaya and Tripura and the least requirements for physicians will be in Sikkim [Figure 4] which is in proportion to the population sizes.

The study was done with the assumption that the healthcare in both India and Northeast India is fully public enterprise and that the roles of the private or merging of both public and private does not exist. The physician to population ratios is increasing with time and since this ratio depends on the population, the lesser the density of the population the higher the ratio becomes. It is understood that under the prevailing situation both India and Northeast have a long way to go to achieve the HLEG recommended 1:1000 (physician to 1000 population) ratio. The reason being the increasing population trend and the sluggish growth of physician numbers. Therefore, if the health planners are determined to improve this ratio to reach the standard level in future, they need to increase the supply of physician by increasing many more medical institutions to be able to cater the growing population in the future.

## CONCLUSION

The study concludes that with the current trend of population growth and the production of health professionals, meeting the future manpower needs in public healthcare in India and its NE region is an apparently challenging task. The requirement for more health workforce in the future is imminent and if not taken enough measure to fill this gap could lead to crisis in the healthcare services. There is a need to strengthen the public healthcare through comprehensive manpower planning as public healthcare still provides affordable care to many poor and rural population. According to reports from National Sample Survey Organization, Government of India, the dependence on public healthcare services has slightly decline from 44% in 1995–96 to 42% in 2014 in rural India whereas higher decline was observed in urban India with a fall to 32% in 2014 from 43% in 1995–96. The increasing dependence on private health-care providers comes with a costly price as the out of Pocket expenditure rises considerably high from around Rs 3561 (54 USD approx.) in 1995–96 to around Rs. 18268 (278 USD approx.) in 2014 which is 413% increase in two decades. It is also important to note that India is a developing country where poverty is still rampant and vast majority of the population depends on the government aid

in assessing cheaper healthcare and studies have revealed that the high cost of healthcare pushed around 55 million Indian people into poverty in a year.<sup>[18]</sup> Therefore, in the wake to avoid such adversity, it is necessary to strengthen the infrastructures in public healthcare system in the country. Given the appallingly low health status combine with the enormity of India's population and the pace at which it is growing, India, has a seemingly relentless public health challenge. Indian public health-care system needs an effective healthcare manpower planning to ensure it meets the future health-care services demand of the expected massive future population in its effort in promoting health, preventing diseases, and lengthening life.<sup>[19-22]</sup>

## SIGNIFICANCE STATEMENT

It is evident that healthcare in India is troubled by the shortage and lop-sidedness distribution of skilled health workers and the worse sufferers of this are the poor, rural, and population from low socio-economic levels. The question to what the future holds for public healthcare has not been ascertain much. This study discover that under the same trend, the shortage of health workforce in public healthcare is inevitable in the future and the apparent requirement of health manpower will rise if adequate precautions is not taken on time. This study will be useful to framing effective healthcare plans to vitalize the existing healthcare system and bring innovations to cater the probable healthcare service needs. The study opens a scope to uncover health-care manpower needs in various sectorial areas and skill based professionals.

## Limitations

The study does not take into account the shocks that may influence the physician requirements in future. This study overlooks the roles played by the private or joint venture of public and private healthcare system. The study consider the situation that public healthcare is the only stakeholder of health-care provider in the country that is the healthcare is fully operated by the government allopathic physicians.

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