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Health and Wellbeing in Northeast India

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Contents

List of Tables

Abstract

The health care provisioning in the states of Northeast India has undoubtedly brought in positive impacts in terms of reduction in mortality rates, prevention of communicable disease, access and affordability of healthcare services for the economically weaker sections. However, health care is a challenging area and unresolved challenges remain within the sector which differ from state to state across the region and require sustained efforts to address them. Critical requirement in this regard are provisioning of health including access to safe and clean drinking water and sanitation facilities. Although infrastructure provisioning is critical for expanding covergae of health care facilities, shortage of helth care professionals in India is one of the biggest challenges and more so in respect ofthe states of northeast India. This paper analyses the existing health scenarion in the states of northeast India based on the secondary data. To ensure safe health and augment healthy life, the states in the region, need to consider redesigning its health service delivery system to foster patient-centered care, continuity of services, coordination across providers and higher quality of care. A far-sighted and pragmatic policy choice can redirect the health system of each of the constituent state and the region at large to a trajectory along the path to higher value. These changes will contribute to improved efficiency, equity and patient satisfaction, and ultimately, better health outcome.

Health and Wellbeing in Northeast India

I. Introduction

The critical requirement for ensuring health and well being of a nation can only be adequately and effectively addressed through adequate provisioning of health care services with a society centric approach under Universal Health Coverage (UHC). The Alma-Ata Declaration on primary health care (1978) established a standard of public commitment towards making health care to be community driven with quality service, accessible-both physically and financially and with equity. This declaraion was the forerunner of the Global Strategy for Health for All by the Year 2000 pursued by WHO and its partners and subsequently the SDG Goal 3- "Ensure healthy lives and promote well-being for all at all ages" by 2030. The emphasis on primary health care is important as it emphasizes on promotion and prevention, addressing determinants, and a people-centred approach. Further it can respond and adapt to rapidly changing nature of demand for health care services and provisions required. A careful reading the SDG-3 and its sub themes clearly underlines the importance of health care provisioning in ensuring health coverage with equity and access to all sections of the people with focussed emphasis on those at the margins and vulnerable. A society centric approach for health care aims to ensure well-being by focusing on people's needs and preferences (both as individuals and communities) as early as possible along the continuum from health promotion and disease prevention to treatment, rehabilitation and palliative care, and as close as feasible to people's everyday environment[1]. The centrality of

the health care services is built upon the edifice of a synergetic approach which focusses on –

a. Comprehensive health care for promotive, protective, preventive, curative, rehabilitative, and palliative care prioritizing key health care services aimed at individuals and families through public health functions.

b. Addressing the social, economic and environmental determinants of health through evidence-informed policies.

c. Individuals and communities, as the central focus of all efforts towards provisioning of health care through advocacy and awareness building to optimize the health care gains across communities.

d. Governance Issues in Health Sector including service providers and delivery, health finance and insurance and ameleorating vulnerablity due to catastrophic health expenditure

India's healthcare delivery apparatus is heterogeneous and characterized by many organizational forms-from individual and small group providers to large corporate groups and there are considerable variations across states and districts. The delivery system is also disjointed and fragmented, which has resulted in gaps in respect of access, quality, and affordability. While there are governance issues in the delivery of public health care system, the regulatory framework has been weak and missing in respect of private health care delivery, which has created large gaps in respect of access and affordability across all sections of the population in the country.

The structural changes in Indian economy since 1992 brought in changes in the social sectors (health and education) and India's health care system became more dynamic. Innovations, technological progress, and investments evolved with changing nature of the demand for health care services. However, not all sections of the society could benefit from these changes and the out of pocket expenditure increased significantly. The public sector health care financed through budgetary provisions which addresses all three components of preventive, promotive and curative health care meets the needs of a relatively small share of the population and, is left struggllling to provide accessible and quality health care.

The private sector has emerged as the foremost provider of healthcare where large organized corporatized health care providers have expanded in the post liberalization period. There are also solo providers which include individual clinics to private small hospitals and nursing homes based on fee for service model. The result of this disparate health care provisioning has led to increase in out of pocket expenditures. Under this scenario, Indian population has to meet own health expenditure, facing the dual risks of poor outcomes and high out-of-pocket (OOP) expenditure.

To address these challenges requires envisioning a transformative approach with deliverable initiatives for providing care with a focus on the needs of all sections of population especially women, children and low-income populations. However, this would require a departure from one homogeneous approach and devise policies and actions based on social and economic context of the population, besides institutional capacity, governance and regulatory framework.

The UNFPA's State of World Population Report 2023 shows that India has emerged as the world's most populous nation and 68% of India's population is working age, which includes those in the 15–64 age range. This demonstrates how India could benefit from the demographic dividend in the future. With a median age of only 28, India's population was among the youngest in an aging world by 2020. This demographic dividend is poised to benefit India till 2055. The Indian health system has witnessed multiple achievements over the course of last few decades and has achieved phenomenol progress in elimination of polio, guinea worm disease, yaws and maternal and neonatal tetanus. The Total Fertility Rate (TFR) has reduced sharply from 3.4 in 1992-93 to 2.05 in 2020. India achieved the Millennium Development Goals target in respect of the Maternal Mortality Ratio (MMR) level of 130 against a target of 139 and nearly succeeded in meeting the Under-5 child mortality target (U5MR of 43 against a target of 42).

Notwithstanding the progress made, it remains a fact that India's health system continues to be a work in progress and there remains large unfinished agenda. There are significant inter-state and intra-state differentials in health outcomes in respect of access as well as quality of healthcare available to them. Besides, with a rising burden of non-communicable diseases in addition to the persistence of communicable diseases, health care infrastructure faces numerous challenges. Health is constitutionally a state subject within India's federal structure; however, the central Government plays a major role in designing and implementing health programs and services in partnership with state Governments. The central and state Governments have taken up a range of measures to augment resources available for essential healthcare services, improve the accessibility and quality of care

provided, and ensure coverage to the poorest households to protect them from risk of catastrophic health expenditure.

The eight states of north east India are strategically located with 98 percent of the borders being shared with neighbouring countries. The region is a mosaic of people comprising of diverse and varied communities settled across its valleys and hills. The geographical terrains and locations have an important bearing on the size and delivery of healthcare services to these states. The health care has largely been state provided in the region. It is pertinent to note here that in India, the Government (Union and the States put together) spends roughly 1.13 per cent of GDP on health, which is grossly inadequate compared to similar spending by other countries. As a result, 62 per cent of healthcare spending is financed by households through out-of-pocket expenditure at the point of care. Among the states of Northeast India while Assam and Tripura have the lowest proportionate share of Government Health Expenditure (GHE) in the GSDP (1.7%), Arunachal Pradesh and Mizoram have the highest proportionate share of GHE (3.4%).

The health care provisioning in the states of Northeast India has undoubtedly brought in positive impacts in terms of reduction in mortality rates, prevention of communicable disease, access and affordability of healthcare services for the economically weaker sections. However, health care is a challenging area and unresolved challenges remain within the sector which differ from state to state across the region and require sustained efforts to address them. Critical requirement in this regard are provisioning of health including access to safe and clean drinking water and sanitation facilities.

II. Overall Health Status in Northeast India

The NSSO 75th round (2018) data shows that 7.5 percent of persons in population reported as ailing (PPRA) with Assam reporting the lowest at less than 3 percent. Further the data shows that ailment was higher in the age group of 60 plus **(11.4) and 45-59 (27.7) followed by age group 0-4 (8.5). The proportion of females in this respect was 8.3 percent and males were 6.7 percent. Further, disease profiling of population showed that major ailments in India across all states are:** Infections, Cardiovascular disease, Endocrine or metabolic disease, Respiratory ailments, Musculo-skeletal and Psychiatric or neurological diseases. While infections including **fevers, jaundice, diarrhoea/dysentery had higher prevalence in rural areas, in urban areas cardiovascular** (incl. hypertension, heart disease) and endocrine, metabolic (incl. diabetes, thyroid diseases) was comparatively higher. A cursory glace at the NFHS-5 data reveal that 19 per cent of households still have no toilet facility, which means that they are defecating in the open. Further, only 59 per cent of households used a source of clean fuel for cooking, which effectively means that 41 per cent do not have such access. While the country celebrated its 75th year of independence, the NFHS-5 data released in 2022 shows mixed progress on various fronts and identifies basic sanitation and clean energy for fuel for cooking as two factors that still need emphasis from the state.

The most basic health indicator, which sheds light on the overall health sector, is the infant mortality rate (IMR) which is a measure of the number of infant deaths per thousand live births in a year. In other words it is essentially a measure of infant survival rate and also reflects the social, economic and environmental conditions in which children (and others in society) live, including health care availability and practices. In respect of maternal and child health, except for Assam, Meghalaya and Tripura, the other six states in the region have high infant survival rate. Assam had been one of the states in India which had persistently reported high IMR. However there has been a decline over the years largely due to the launching of the national rural helath mission (NRHM now NHM).

The Under Five Mortality Rate U5MR in the region although less than the national average however, in recent years increased in Manipur and Tripura. The under five mortality rate (U5MR) across India continues to be high. The SDG target to reduce U5MR to 25 per thousand by 2030 remains a major challenge, yet states like Mizoram Arunachal Pradesh and Sikkim, have successfully achieved the SDG target for U5MR. Tripura, and Manipur which had registered substantial decrease in U5MR during NFHS-4 compared to NFHS-3 has witnessed sudden spurt during NFHS-5, which is worrisome and puts a challenge on the states to attain the SDG target. Meghalaya, Assam, and Nagaland though continue to have high U5MR, the declining trend is likely to help the states to reach SDG target by 2030. For all major causes of under-5 death in India, the death rate decreased largely for decrease in death from infectious diseases although the magnitude of decline varied widely across the states[2]. A major factor that contributed towards a reduction in infant mortality was the increase in institutional birth especially after the launching of the Janani Suraksha Yojana

[2] India State-Level Disease Burden Initiative Child Mortality Collaborators. Subnational mapping of under-5 and neonatal mortality trends in India: the Global Burden of Disease Study 2000-17. Lancet. 2020 May 23;395(10237):

in the year 2005[3]. Child and maternal malnutrition was another risk factor, to which child mortality could be attributed to.

The expansion of the JSY has made a significant impact on improving institutioanl births across the region. Institutional delivery in public health facilities has increased in the region. Except for Meghalaya and Nagaland all the other six states in the region have almost 80 percent child births taking place at institutions either public or private. In Nagaland 45.7 percent of the births are delivered institutionally and the same for Meghalaya is 58.1. Pertinent to note here that caesarean section for delivery has also been increasing and more so in private facilities especially in urban areas. This reflects the changing health seeking behaviour in the region and this has a bearing on the service provisioning for maternal and child health.

Nagaland and Meghalaya are two laggards in respect of healthcare utilisation particularly in the rural areas. In rural ares of both the states, less than one-tenth of the pregnant women have reported of undertaking at least four ANC visits. A comparison of institutional delivery and full immunisation coverage across rural areas of the eight Northeastern states places Meghalaya and Nagaland at the bottom of the list. The state of primary healthcare service utilisation is a huge concern across rural areas of both the states. Nagaland has the lowest coverage of institutional delivery and full immunisation in rural parts among all the states of the Northeast region. One of the major reasons is the hilly terrain of the state which has slowed down the expansion of health infrastructure. This is reflected in terms of wide inter-district variations in respect of the two indicators of maternal and child health. The institutional delivery coverage for example in Kohima and Dimapur districts is more than five times that of Long Leng and Mon districts. Similarly, full immunisation coverage in Kohima is six times that of Long Leng district. Meghalya too sufferes from accessibility issues, the state has very poor connectivity, due to its hilly terrains and remoteness of the health centres from human habitations.

[3] Janani SurakshaYojana (JSY) is a safe motherhood intervention under the National Health Mission. It is being implemented with the objective of reducing maternal and neonatal mortality by promoting institutional delivery among poor pregnant women. The scheme, launched on 12 April 2005 by the Hon'ble Prime Minister is a centrally sponsored scheme, which

Increase in immunization coverage also contributed towards reduction in child mortality across the states in India[4]. The immunization programme[5] aims to achieve the goals envisaged in National Health Policy and National Population Policy of India. In order to expand its universal immunization programme (UIP), India released the first National Vaccine Policy in 2011. The National Health Policy 2017 reiterates its emphasis on UIP and the focus is build upon the success of Mission Indradhanush[6]. Arunachal Pradesh[7] Assam[8], Manipur[9], Meghalaya[10], Mizoram[11]and Tripura[12] together have as many as 26 districts covered under High Focus Districts to expand the immunization coverage in unserved and underserved areas and child population. The expansion of the UIP through Indradhanush Phase-III which targets 216 High Focus Districts in the country has brought about substantial improvement in UIP coverage as revealed from the NFHS-5 data. All the five states in the region have substantially improved their immunization coverage for children in the age group-12-23 months. However except for Mizoram (83.7) and Meghalaya (80) rest of the states in the region are far away from the national average (83.8) in achieving immunization coverage for the children in the age group 12-23 months. Arunachal Pradesh continues to be highest laggard in the region with coverage of only 64.9 percent (NFHS-5) while rural Nagaland (68.8) as mentioned earlier has inadequate coverage under UIP. Adequate UIP is most vital

[4] At the time of independence, India reported the highest incidence of smallpox cases in the world. The cholera and plague epidemics were a recurring phenomenon but limited budgetary availability curtailed majority of the efforts. Tuberculosis was another major cause of morbidity and mortality. In May 1948, the Government of India launched the BCG Vaccine and by 1949, the BCG vaccination was extended to schools in almost all States of India. In 1967-1968, the smallpox eradication strategy was reformulated with increased focus on surveillance, epidemiological investigation of outbreaks and rapid containment drives. As soon as India was declared smallpox free in 1977, the country decided to launch National Immunization programme called Expanded Programme of Immunization (EPI) in 1978 with the introduction BCG, OPV, DPT and typhoid-paratyphoid vaccines, Basu RN. Smallpox eradication: lessons learnt from a success story. Natl Med J India. 2006 Jan-Feb;19(1).

[5] The EPI targetted at least 80 per cent immunization coverage for infants, and the vaccination was offered through major hospitals in the urban areas. India started its universal immunization programme (UIP) in 1985. It provided guiding principles for functioning of immunization programme in the country. For details see *National Vaccine Policy*, Ministry of Health and Family Welfare, Government of India; 2011. Government of India, New Delhi.

[6] National Health Policy 2017; Ministry of Health and Family Welfare, Government of India.

[7] Changlang, East Kameng, Lower Dibang Valley, Lohit Lower Subansiri

[8] Barpeta, Bongaigaon, Darrang, Dhubri, Goalpara, Golaghat, Hailakandi, Karimganj, Marigaon, Nagaon Sonitpur and Kokrajhar.

[9] Churachnadpur, Senapati, Tamenglong ,Ukhrul

[10] East Khasi Hills, West Garo Hills, West Khasi Hills

[11] Lawngtlai, Lunglei, Mamit, Saiha

[12] Dhalai, Tripura North, Tripura West

for improving neo-natal and U5MR and Mission Indradhanush requires concerted effort for effective implementation across the states of Northeast India to ensure health and well-being of children.

While institutional delivery and ante-natal and post-natal care has helped in reducing child mortality rate, the maternal mortality also declined due to these institutional interventions. According to the estimates of the Sample Registration System (SRS) of India, the MMR has significantly dropped from 400 per 100,000 live births in the early 1990s to 230 per 100,000 live births in 2008 and further to 97 per 100,000 live births in 2018-20, with the highest rate in the State of Assam (195 per 100,000 live births)[13]. Although there is no data available on MMR for the other states of the region except Assam, a recent study[14]on MMR based on estimates with unit level HMIS data, shows that Arunachal Pradesh has the highest MMR (284) and Mizoram the lowest (131). The MMR for the all-India is 122 during 2017-19 as per HMIS data against the SRS estimate of 103 for all India during 2017-19. The estimates reveal that except for Mizoram and Nagaland all the states of the region reportedly have MMR higher than 200. The study revealed that districts with better health infrastructure, maternal health care, especially postnatal care, and maternal nutrition have significantly less MMR.

Although there is stagnation in early marriage but there has been an increase in teenage pregnancies, leading to complications at birth, including low birth weight and higher mortality rates (NFHS-5). The North Eastern states of Tripura (40.1 percent) and Assam (31.8 percent) show high prevalence of child marriage together with teenage pregnancies (Tripura-21.9 percent, Assam-11.7 percent) which is much higher than the national average on child marriage (23.3 percent) and teenage pregnnacy (6.8 percent). There has been an increase in prevalence of teenage pregnancies and child marriage since the NFHS-4 (2015-16) in the states of Tripura, Assam, Manipur, and Meghalaya compared to the national average.

In India nutritional deficiencies are structural, originating from the embryonic stage itself owing to prevalence of nutritional deficiencies both for men and women. The data on

[13] The SRS has been a gold standard source for fertility and mortality data for more than five decades. It is the largest demographic and health survey in the country, which gives reliable estimates at the national and state level separately by urban and rural areas.

[14] Goli S, Puri P, Salve PS, Pallikadavath S, James KS. Estimates and correlates of district-level maternal mortality ratio in India. PLOS Global Public Health. 2022 Jul 18;2(7):e0000441. doi: 10.1371/journal.pgph.0000441. PMID: 36962393; PMCID: PMC10021851.

women's nutritional status in NFHS-5 show that the percentage of women who are slim (BMI less than 18.5) has decreased from 22.9 percent in 2015-16 to 18.3 percent in 2019-21, while the percentage of women who are obese or overweight has increased from 20 percent to 24 percent during the same time period. The percentage of anaemic women aged 15 to 45 years increased from 53 percent to 57 percent. Studies have shown that children born to adolescent mothers with nutritional deficiencies had a 10 percent increased risk of stunting. Poverty and gender disparities exacerbate the intergenerational cycle of undernutrition, which affects cognitive and physical development. Anaemia in women of reproductive age (15-49 years) indicates an increase in Assam (65.9 percent), and is higher than the national average of 57 percent. NFHS-5 data on anaemia in adolescent girls (15-19 years), shows a sharp rise in Assam at 67 percent (24.3 percentage points increase), and Tripura at 67.9 percent (15.3 percentage points increase). Adolescent mothers who suffer from anemia have long-term consequences, including the possibility of maternal death, low birth weight, and an increased chance of anemia in the unborn child, which perpetuates the structural cycle of anemia at birth. Increase in teenage marriage and early pregnancy in some of the states of Northeast India also reflect the socio-economic crisis in ensuring access to completion of education and seeking a sustainable livelihood.

Except for Sikkim which has achieved substantial progress in respect of its child health, other states of the region face challenges in respect of stunting, wasting, underweight and anaemic children. Although Nagaland, Mizoram and Manipur has lowest incidence of anaemia among women in the country, yet in all the three states the incidence has incresed over the period NFHS-4 to NFHS-5. Assam and Tripura has the highest incidence of anaemia among women in the region which has also risen sharply during the two NFHS-4 and NFHS-5 rounds. Anaemia in children under five has increased in all states except Meghalaya. Assam is the highest at 68.4 percent (32.7 percentage point increase from 2015-16), followed by Mizoram at 46.4 percent (27.1 percentage point increase from 2015-16), Manipur at 42.8 percent (18.9 percentage point increase from 2015-16), and Tripura at 64.3 percent (a 16-percentage point increase from 2015-16). Though anaemic men are fewer in Assam and Tripura, overall there is an increase in anaemia among men, women and children in the region which largely points to nutritional deficiencies.

Stunting rates in children under the age of five are alarming for Meghalaya at 46.5 percent, the highest in the region and nation wide (fig 2). The NFHS-5 shows a sharp rise in stunting for Tripura, which is a cause for concern. Also alarming are Manipur, Sikkim, and Assam in the category of high-level stunting (30-< 40 percent) with more than half the districts

presenting a public health concern. Wasting also showed a significant incline in the states of Nagaland, Manipur, Mizoram, and Assam as compared to 2015-16. Assam, with a prevalence of 21.7 percent, was higher than the national average at 19.3 percent; Nagaland (19.1 percent) showed a steep incline (7.8 percentage points) from NFHS-4 and was second highest; followed by Tripura at 18.2 percent. Rates of underweight children in the North-Eastern states also showed worrying trends. Four of the eight states showed an increase in the prevalence of being underweight, with Assam being the highest at 32.8 percent and Manipur the lowest at 12.7 percent. Nagaland's underweight children, increased from 16.7 percent in 2015-16 to 26.9 percent in 2019-21 showing an increase of 10.2 percent. Mizoram and Sikkim are at the lowest rung with figures standing at 12.3 percent and 12.4 percent respectively. Along with underweight, seven out of eight northeastern states, except Meghalaya, show rising trend in prevalence of overweight children less than five years of age. Sikkim, which recorded a decrease of over 3 percent in underweight children, showed one percent increase in the overweight or obese children. Overall, the northeastern states show a higher prevalence of children under-5 years that are overweight as compared to the national average of 2.1 percent.

While underweight or overweight resulting from nutritional issues is part of the structural aspect of health, another major stressor for the health is prevalence of communicable diseases and also vector borne diseases. The recent Covid 19 outbreak brought out the challenges of health care sector in the event of any outbreak of a communicable disease. The data from National Health Profile (NHP) India 2022 show that the states in the northeast region reportedly have higher prevalence of malaria, dengue and Japanese encaphalitis. The Northeast region of India is highly prone to vector-borne diseases such as malaria, Japanese encephalitis (JE), lymphatic filariasis, and dengue/chikungunya due to its topography and climatic conditions which accentuate the growth and spread of these diseases. Factors like efficient malaria vectors, the predominance of *Plasmodium falciparum* (including chloroquine-resistant strains), and indigenous transmission exacerbate the situation. Despite contributing only 4% of India's population, the region experiences a disproportionate burden of these diseases. Nationally, over 1 billion people are at risk, with India contributing the majority of cases in the WHO South-East Asia Region. Despite advancements in epidemiological understanding and resources like global fund for AIDS, tuberculosis and malaria (GFATM), these diseases continue to pose significant health and equity challenges.

The states in Northeast India are undergoing rapid ecological changes due to population growth from migration, urbanization, and environmental degradation, creating conditions

favorable for vector proliferation and disease transmission. Malaria, Japanese encephalitis (JE), and lymphatic filariasis persist as significant public health issues, with dengue emerging as a growing concern[15]. All districts in Assam are co-endemic for *Plasmodium falciparum* and *P. vivax*, with low to moderate transmission intensities. *P. falciparum* predominates, causing most cases and deaths. Five districts—Karbi Anglong, Dima Hasao, Chirang, Kokrajhar, and Udalguri—are high-risk areas due to high case incidence, significant indigenous tribal populations, extensive forest cover, and scattered settlements[16]. India has launched malaria control and elimination through the NVBDCP employing strategies such as vector control and surveillance, treatment, and research partnerships[17]. Efforts to control malaria have been hampered by difficult terrain, inadequate healthcare infrastructure, and a lack of community awareness. However, initiatives such as insecticide-treated bed nets, indoor spraying, and effective anti-malarial drug distribution have shown promising results in reducing malaria burden[18].

Japanese Encephalitis (JE) remains a significant vector-borne disease in Assam and the states of Northeast, with annual cases and fatalities reported since the first recorded outbreak in 1978 in Lakhimpur district. Assam accounts for over one-third of India's JE burden[19]. Historically, JE primarily affected individuals aged under 15 years, but in Assam, in recent years the health data show a shift and higher prevalence among those over 15 years and high-risk districts which have experienced repeated outbreaks include Dhemaji, Dibrugarh, Golaghat, Jorhat, Lakhimpur, Sibsagar, and Tinsukia[20]. The transmission of the disease in the state is influenced by various factors, including vectors, amplifying hosts, agricultural methods, and sociocultural behaviors[21]. Compared to other JE-endemic states in India, Assam has experienced a considerable shift in the prevalence of patients by age.

[15] Prasad H. Evaluation of malaria control programme in three districts of Assam. J. Vector Borne Dis. 2009; 46: 280–287.

[16] V Dev, VP Sharma & K Barman. (2015). Mosquito-borne diseases in Assam, north-east India: current status and key challenges. *WHO South-East Asia Journal of Public Health*, 4 (1), 20 - 29. World Health Organization. Regional Office for South-East Asia.

[17] National Vector Borne Disease Control Programme;Government of India Ministry of Health & Family Welfare, 2015.

[18] Dev V, Bhattacharyya PC, Talukdar R (2003) Transmission of Malaria and its Control in the Northeastern Region of India;. *Journal of Association of Physicians India 51: 1073-1076*

[19] Khan SA, Choudhury P, Kakati S, Doley R, Barman MP, et al. (2021) Effectiveness of a single dose of Japanese encephalitis vaccine among adults, Assam, India, 2012- 2018. Vaccine 39(35): 4973-4978.

[20] Same as 16 above

[21] Phukan AC, Borah PK, Mahanta J (2004) Japanese encephalitis in Assam, northeast India. Southeast Asian J Trop Med Public Health 35(3): 618-622.

Dengue too has emerged as a growing public health challenge in Assam, with the first cases reported in 2010[22], escalating significantly in subsequent years. Most cases occur in Guwahati during the post-monsoon season, predominantly affecting adult males aged 26–60 years. Dengue is now spreading to semi-urban and adjoining regions in Northeast India[23]. Dengue fever is spreading to semi-urban areas and adjacent districts/states in Northeast India. With the rapid urbanization and prevailing climatic conditions, it is projected that dengue will emerge as a major public health concern in Northeast India.

Among the states Meghalaya has the higher incidence of cases reported for communicable diseases. As per the most recent (2018-19) data, Nagaland (with 1.66 percent prevalence), Mizoram (with 0.91 percent), and Tripura-(with 0.63 percent prevalence)-are high prevalence states while Arunachal Pradesh recorded zero prevalence rate for HIV. The disease burden of vector-borne illnesses like malaria, JE, lymphatic filariasis, and dengue in the states of Northeast India is substantial and requires a comprehensive, community-driven, cost-effective, and sustainable approach. In the evolving ecological landscape, a comprehensive understanding of disease epidemiology is essential for developing effective control measures to mitigate disease transmission. Controlling vectors is a costly and time-consuming process as this requires to be repeated annually. There is an urgent necessity to address the issue with cost effective investments.

Improved health-care services through disease surveillance, reporting procedures, vaccine coverage, and supportive therapy are necessary to alleviate clinical symptoms. There is a critical necessity for strong disease surveillance systems, regular assessments of the therapeutic effectiveness of current drug regimens for achieving successful radical cures, and international collaboration for synchronized vector control efforts to avert further spread. Additionally, enhancing pharmacovigilance, curbing the distribution of counterfeit medications, and implementing a standardized drug policy among private healthcare providers while phasing out monotherapies are of utmost importance. There is a need to broaden the scope of preventive interventions and ensure access to treatment, with a focus on high-risk regions to effectively combat malaria. The primary elements of this strategy include case surveillance, facilitating early diagnosis through rapid diagnostic tests and/or microscopy, vector control via indoor residual spraying and long-lasting insecticidal nets (LLINs), and treatment utilizing evidence-based artemisinin-based combination therapies. Furthermore, supportive initiatives involving community engagement and awareness campaigns that leverage information, education, and communication are vital to prevent the establishment of environments conducive to vector proliferation.

While communicable diseases require higher investment and awareness building through socially preventive medicine, the challenge is higher for non-communicable diseases. Non Communicable Diseases (NCDs) are yet another major challenge for public health, not only in terms of human suffering they cause but also in terms of the damage they inflict on the socioeconomic conditions of the households affected and thus leave its adverse effect on the overall socio-economic development of a nation. The epidemiology of disease in India has shifted from infectious diseases, undernutrition, maternal and childhood diseases to the increasing burden of NCDs over the past two decades and contributed to 65% of all deaths in the country in 2019[24]. These are caused by the high incidence of key preventable risk factors such as tobacco use, alcohol consumption, poor eating habits, insufficient physical activity, overweight/obesity, hypertension, diabetes, and hyperlipidemia. Individual clustering leads to major NCDs such as CVDs, cancer, diabetes, and stroke[25]. While similar epidemiological shifts occur all throughout the world, India is distinctive and hard due to its variety. In 2013, the Government of India accepted the Global NCD Monitoring Targets and developed ten (10) national specific NCD targets and twenty one indicators to be met by 2025. In the Northeast region of India there is a predominance of behavioural risk factors (tobacco and alcohol use) in respect of NCDs[26]. The National Health Profile 2022, shows that out of 5.91 crore people screened under National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS), almost 7.6 percent were diagnosed with hypertension, 5.93 percent with diabetes, 2.49 percent with hypertension and diabetes, 0.255 percent with CVDs, 0.11 percent with stroke and 0.19 percent with common cancers. Urban residents from northeast India were at increased risk of fasting blood sugar, alchohol use and raised blood pressure. The highest proportion

[22] The first dengue cases were reported in 2010, with 237, followed by 1058 and 4526 in 2012 and 2013, respectively. (Data Source: State Health Directorate of Assam, unpublished)

[23] Same as 16 above

[24] Indian Council of Medical Research (ICMR), Public Health Foundation of India, and Institute for Health Metrics and Evaluation. India: Health of the Nation's States. *The India State-Level Disease Burden Initiative*. New Delhi: ICMR, PHFI, and IHME; 2017.

[25] Mathur P, Kulothungan V, Leburu S, Krishnan A, Chaturvedi HK, Salve HR, et al. National noncommunicable disease monitoring survey (NNMS) in India: estimating risk factor prevalence in adult population. Plos One. 2021;16(3):e0246712.

[26] Ramamoorthy, T., Leburu, S., Kulothungan, V. *et al.* Regional estimates of Noncommunicable diseases associated risk factors among adults in India: results from National Noncommunicable Disease Monitoring Survey. *BMC Public Health* **22**, 1069 (2022). https://doi.org/10.1186/s12889-022-13466-5

of men aged between 18 and 69 years from the Northeast region are found to engage in alcohol consumption[27]. The Northeast also has incidence of a high prevalence of smoking and smokeless tobacco use. The ICMR report on Profile of Cancer and Related health Indicators in the North East Region of India (2021), showed that in males, cancer of the oesophagus (13.6 percent) followed by lung (10.9 percent), is more prevalent; while in respect of females, cancer of the breast (14.5 percent), followed by the cervix uteri (12.2 percent) have the highest incidence. Within the region urban areas of Kamrup district in Assam has the highest probability of developing any cancer over a lifetime (1 in every 4 males and 1 in every 6 females). Further the proportion of tobacco-related cancer is 49.3 percent in males and 22.8 percent in females. The high incidence of cancer and the alarming situation in the region can be understood from the two statistics cited here. The age-adjusted cancer incidence rate in males (269.4 per 100,000) has been recorded in the Aizawl district in Mizoram, while the same for females (219.8 per 100,000) is found in Papumpare district in Arunachal Pradesh, which also happens to be the highest in the region and the country. The proportion of cancer patients seeking treatment outside Northeast is highest for Sikkim (95.3 percent) followed by Nagaland (58.1 percent), the two states where the percapita income is also higher compared to other states of the region. The same Report projected the number of cancer cases for 2020 to be 50317, while for the year 2025 it is estimated to be 57,131. Given that the mortality – incidence ratio is higher in males than in females also reflects the double burden of disease in that not only does the health expenditure becomes catastrophic but also reduces the earning opportunity in the household with the death of the male member who remains the major income earner in the family. The report highlights that cancer continues to be a major public health concern in the region.

Yet another challenge that confronts health care in northeast is the rise in Suicidal deaths and psychological trauma. Significantly there has been an alarming increase in suicidal deaths in the country with higher incidence found in case of males[28]. Suicidal deaths are found to have increased in the states of Mizoram, Assam, Tripura and Nagaland while the same has declined in the states of Manipur, Meghalaya, Arunachal Pradesh and Sikkim. Suicidal deaths are also higher in the age group 18-45 years. Family-related problems and distress caused due to physical and mental health conditions accounted for a little over 50 percent of all causes of suicide while 14 percent of suicidal deaths occured from both alcohol

[27] Same as 26.

[28] NCRB, 2022.

and substance-use as well as economic and financial insecurity owing to unemployment and income uncertainity. The highest incidence of suicide was found in respect of daily wageworkers (25.6 percent), and professionals (9.2 percent). As per the NCRB data (2022), 64.3 per cent of the suicide cases were reported to have an annual income of less than Rs one lakh. Thus economic uncertainity and insecurity is the biggest trigger for suicidal deaths and calls for larger socio-economic intervention. While India is poised as the country with biggest demographic dividend with its bulge of young population, the growing economic uncertainity and rising incidences of suicidal deaths raise serious social and economic concerns.

Accidental deaths has been emerging as another major cause of death especially deaths from road accidents which has serious implications for overall developmental interventions. India experienced a record high of 1, 68,491 road accident deaths in 2022, with 4, and 61,312 accidents reported and 4, 43,366 injuries nationwide, according to the most recent data. This amounts to one death every three minutes and highlights the country's high rate of road accidents and possible disability cases. In India, roughly 43 percent of road traffic accidents (RTI) patients require hospitalization for more than 7 days[29]. Long-term hospitalization following RTI raises out-of-pocket expenses and the annual cost of RTI in LMICs is estimated to be between one percent and three percent of GDP[30]. Premature death accounts for a significant portion of productivity costs. It has been established that the process of expensive treatment and patient care places a significant emotional, time, and financial burden on families, including job loss, children dropping out of school, decreased nutritional quality, and permanent debts. These repercussions on a single family can have far-reaching consequences for society as a whole[31]

While incidence and prevalence of disease together with nutritional level reflect the overall health status of the people of the region, the health seeking behaviour of the people reflect the availability, access and affordability for the services sought. The NFHS 75th round data shows that allopathic treatment was most sought though there exists inter state variations across the states of the region. There was also considerable accessing of AYUSH treatment

[29] Kumar GA, Dilip TR, Dandona L, Dandona R. Burden of Out-of-Pocket Expenditure for Road Traffic Iinjuries in Urban India. *BMC Health Serv Res* 2012; **12:** 285. doi: 10.1186/1472-6963-12-285.

[30] Same as 29 above.

[31] Mohan D. The Road Ahead, Traffic Injuries and Fatalities in India, Transport Research and Injury Programme, WHO Collaborating Center. Indian Institute of Technology, Delhi, April, 2004.

and Arunachal Pradesh (10 percent), Mizoram (10 oercent), Sikkim (6.4 percent) and Assam (6 percent) reported higher proportion of people than the all-India average (4.4 percent) going for Ayush treatment. Further in so far as accessibility to healthcare treatment is taken into account the NSSO 75th round data shows that except Assam (71 percent) and Nagaland (73 percent), more than 80 percent population across the other states in the region go to public/government hospitals for their treatment unlike the major Indian states where private hospitals are more prominent.

A large proportion of households in India are catastrophically impacted by out-patient expenses relative to in-patient expenses. Almost 80 percent to 85 percent of catastrophically affected households incur OPD expenses compared to 45-50 percent for IPD[32]. Similar findings on the larger impact of OPD expenses on catastrophic and impoverishing health spending bear out from other analyses. A study by NIPFP study from the 71st Round NSSO survey[33] shows there is a higher incidence of catastrophic payments for outpatient care as compared to inpatient care.

The India Human Development Survey (IHDS-II)[34] findings show impoverishment effects of health expenditure are predominantly driven by outpatient spending, particularly for informal sector households. More broadly, the NSSO's 75th Round survey on social consumption of health shows that over two-third of total OOPE are on out-patient care, and over 70 percent out patient care is sought in the private sector. Approximately 80 percent health expenditure in rural areas and 84 percent health expenditure in urban aeas is met from household income/savings. Evidence from these studies show that there are challenges in respect of lack of awareness on health care, access, absence of manpower, affordability and accountability[35]; double burden of disease and an ageing population together with rising incidence of ischaemic heart disease, COPD and stroke[36], and limited availability of formally trained health care providers[37]. The NSSO 75th round data shows

[32] https://nipfp.org.in/media/medialibrary/2019/12/WHO_NSSO_report_2019.pdf

[33] Same as 19 above.

[34] https://ihds.umd.edu/system/files/2020-03/07HD inIndia.pdf

[35] Kasthuri A. Challenges to Healthcare in India - The Five A's. Indian J Community Med. 2018 Jul-Sep;43(3):141-143. doi: 10.4103/ijcm.IJCM_194_18. PMID: 30294075; PMCID: PMC6166510.

[36] Selvaraj S, Karan K A, Srivastava S, Bhan N, & Mukhopadhyay I. India health system review. New Delhi: World Health Organization, Regional Office for South-East Asia; 2022.

[37] Rao M , Rao KD , Kumar AKS , Chatterjee M , Sundararaman T . Human resources for health in India . Lancet . 2011 ; 377 (9765): 587 – 98 .

that health care services are sought from public/government facilities, private doctors, clinics, corporate hospitals, stand alone nursing homes to alternative medicines etc. The percentage distribution of persons by coverage of scheme of health expenditure support[38] shows that it is only in Mizoram that 79 percent people in rural areas and 72 percent people in urban areas are under coverage of government schemes. The picture is somewhat fair in respect of Meghalaya (41 percent in rural area and 46 percent in urban arae). In other five states of the region, people covered by government supported health care schemes are very low- Manipur has the lowest coverage (1 percent in rural areas 2.3 percent in urban areas), Nagaland (4 perecnt in rural areas and 6.7 percent in urban areas) and Arunachal Pradesh (5.5 percent in rural areas and 5.7 percent in urban areas). The out of pocket expenditure data[39] shows that hospitalization expenditure excluding child birth was highest in Manipur for rural areas (Rs.13,977/- in respect of government hospitals and Rs.59,194/- for private hospitals). The same was lowest in Mizoram for rural areas (Rs.3444/-for government hospitals and Rs.7970/- for private hospitals. The out of pocket expenditure for rural population in Tripura was very high (Rs.56,776/-) for private hospitals while in government facilities the same was Rs.4909/-. In respect of urban areas in the region, Assam had highest expenditure for government hospitals (Rs.31482/-) and also private hospitals (Rs.57,067/-).Tripura also had high out of pocket expenditure in urban areas for the private hospitals (Rs.55,297/-) compared to government hospitals (Rs.12,132/-). Mizoram had the lowest out of pocket expenditure in urban areas among all the states of the region both for government hospitals (Rs.5599/-) and also private hospitals (Rs.12,691/-). The precarity of health seeking behaviour in the region can be discerned from the figures given above and there is wide inter state disparity in respect of availability of health care facilities and also health seeking behaviour in the region.

The population of Assam which was 31,206 thousand persons is expected to increase to 39, 399 thousand persons with an old age (60+) share 11.6 percent. The projected life expectancy for males is 69.5 years while the same for females in 72.4 years[40].

India is in the midst of epidemiological shifts, which will have significant bearing on its demographic profile over the next several decades. Notwithstanding the improvements in

[38] Health in India – 2018. NSS 75th Round", Ministry of Statistics & Programme Implementation

[39] *ibid*

[40] Health profile India

life expectancy, reduction in child and maternal mortality, the expanding urban population[41] along with the burden of chronic non-communicable diseases (NCDs) will impact the health care needs and demand for several decades. The envisioning of health care provisioning and investment has to address the long term human development aligning with the India's Vision for 2047 based on Inclusive Development approach based on *Bharatiya Model* of Inclusive Growth and *Atodaya Welfarism* whose basic premise is *Sabka Sath, Sabka Vikas, Sabka Vishwas*[42].

III. Key Inputs for a resilient Health Care Apparatus in Northeast India

A. Medical Education and Heath Infrastructure

India faces demand–supply gaps in medical education. In order to increase the medical seat capacity, public medical colleges have created new seat capacities. Simultaneously infrastructure requirements for setting up medical colleges have also been relaxed. During 2018-2022, India added 225 new medical colleges with the total number increasing to 704 as of 2023-24. The number of seats for medical education increased to 107,950, the number of postgraduate seats also doubled in the country in the last eight years. India has 0.9 doctor per 1,000 population (CBHI, 2021)[43], with substantial inter-state differences. This is much lower than the World Health Organization (WHO) recommended norm of one doctor per 1,000 population. Within the overall shortage, of particular concern is the shortage of specialists, aggravated by the increasing burden of non-communicable diseases (NCDs) and the ageing population.

In northeast region, Assam has upscaled its medical education in a large way with setting up of new medical colleges in each district headquarter. The total number of government hospitals in northeast India increased from 522 to 1865 during 2011-21 bed capacity during the period also experienced noteworthy growth, escalating from 23,248 to 49,291 beds. Despite the improvements in rural health care centres in 2022 compared to 2005, following the implementation of NHM, the progress is not sufficient to provide healthcare services to the growing population in the region. The region as a whole faces lesser shortfalls in Sub-

[41] 36 percent in 2022 World Bank, Development Indicators, 2022.

[42] https://www.niti.gov.in/sites/default/files/2023-06/NITI_policy-paper_BMID_2023-May.pdf

[43] Central Bureau of Health Intelligence (2021). National Health Profile 2021. Ministry of Health and Family Welfare. Retrieved from https://www.cbhidghs.nic.in/showfile.php?lid=1160

Centres (19.21 percent), PHCs (0.93 percent), and CHCs (17.74 percent) compared to the national average for the Sub-Centres (25 percent), PHCs (31percent), and CHCs (36 percent). Among the states of the region, Assam, Manipur, and Meghalaya, face significant shortfalls in rural health infrastructure. In respect of urban health centres, considerable shortfall existed in Sub-Centres (90.62 percent), PHCs (24.94 percent) and CHCs (57.11percent) in the year 2022. At the all India level, the shortfalls were higher across health centres- Sub-Centres (95.95 percent), PHCs (36.39 percent), and CHCs (85.43 percent). This shows that there is gross undersupply of public health care facilities in urban areas of the region and the country as a whole.

In respect of healthcare personnels in the region, in rural areas, there has been substantial improvement in respect of availability of health care professionals in 2022 after the launching of NRHM in 2005. However in respect of Specialists at CHCs, the shortfall has increased from 6.13 percent to 82.42 percent during the period which indicates that retention of specialists at rural health centres would also require eco-system support. In urban areas, there are shortages in respect of ANMs at PHCs (42 percent) and Specialists at CHCs (57.50 percent). A recent study has shown that at the state level relationship between a state's economic development and the availability of doctors appears to be linear[44]. The study shows that the states of northeast India despite their high per capita income have a relatively low density of doctors. The availability of doctors has no relationship with per capita public health expenditure. Rather, the availability of seats in medical education has strong relationship with availability of doctors especially in case of state medical colleges where increasing seat capacities in medical colleges/nursing colleges have led to increased availability of doctors. Several incentives like compulsory service in government hospitals for a fixed duration after graduation to become eligible for PG admission as currently in practice in Assam, compulsory one year service after PG in government hospitals has helped in ensuring a steady flow of doctors in the state. Incentivised eco system structures in the work place can help in addressing shortage of doctors and nurses in the region taking into consideration the physiographic conditions of the region and location of the health care facilities and centres.

India has the largest number of medical colleges in the world. Despite this, India's average annual output of graduates per medical college is 151, as compared with 220 in Eastern

[44] Agarwal, A., Balani, K., and Venkateswaran S. (2023). Medical Education in India: A Study of Supply-side Dynamics (CSEP Working Paper 55). New Delhi: Centre for Social and Economic Progress.

Europe and 930 in China. The number of medical graduates per 100,000 population in India is 4.113, which is much lower than that of the OECD countries. The same for the states in northeast India is less than one with Assam having the highest with 0.68 while Nagaland the lowest ratio of 0.12. The reasons for low seats per college are largely related to the onerous permission procedures for setting up and running colleges, stringent bed occupancy norms and high initial capital expenditure. The shortage of teaching faculty in medical colleges is yet another major challenge for health sector in the region. It is only in 2023 that Nagaland got its first medical college in the state. As per the international norms of health professional availability w.r.t. population, WHO norms state that there is requirement of one doctor per 1000 population and two nurses per 1000 population. The states in the region at present have a supply gap of 36,009 registered doctors. The number of allopathic doctors in the Northeast states registered with the Medical Council of India till the year 2022 was 36,373. The distribution across states show a highly skewed picture with 25,980 doctors (71 percent) registered in Assam, 4995 doctors (14 percent) in Manipur, 2683 doctors (8 percent) in Tripura, 1660 doctors (5 percent) in Arunachal Pradesh and the remaining two percent registered doctors were in the states of Mizoram (156), Nagaland (166) and Meghalaya (803)[45]. The availability of specialist doctors is yet another challenge to make health care available with incidence of non-communicable diseases and injuries together overtaking infectious and childhood diseases in terms of disease burden in every state of the country.[46] The availability of courses for specialization and super specialization is very limited in the region. At present (uptil 2024) there are only 1109 seats available for post graduate and super specialization courses are concerned; infact there are only 72 super specialization setas available in the Medical Colleges of the region which are distributed across three states of Assam (59), Manipur (11) and Meghalaya (2). In the states of northeast India almost two thirds (63 percent) of the deaths were due to non communicable diseases (NCD)[47], which makes it imperative to build a much higher seat capacity at the PG level, given its importance in attending to a more complex disease burden, as the states steer their demographic transition. Besides the shortage of specialist and superspecialist doctors and teaching faculty, the shortage of non-faculty members, junior residents and senior residents, who comprise the important supplementary staff required for the functioning of medical colleges and hospitals, is an equal concern. In respect of nurses, there are a total of 43,642

[45] National Health Profile, 2022, CBHI, Govt. of India

[46] https://www.healthdata.org/research-analysis/health-by-location/disease-burden-initiative-india, accessed on 09.11.2023

[47] *Same as 21.*

registered nurses in the region and based on the WHO norm of 2 nurses per 1000 population the region has an overall gap of 66 percent nurses. Across the states Northeast India there is one nurse per 1483 population whereas at country level there is 1 nurse per 890 people. This indicates the scarcity in supply of medical and nursing services in the region.

The launching of the Pradhan Mantri Swasthya Suraksha Yojana (PMSSY) in 2006 steered the way for setting up superspeciality hospitals like AIIMS and upgrading the central and state government medical colleges to increase the number of MBBS seats. This was further paced up with expansion of health infrastructure including buildings and human resources, equipment and other infrastructure, as part of the "Minimum Requirements for annual MBBS Admissions Regulations, 2020" to make the process of setting up a college more financially viable and incentivise the opening of more medical colleges (MoHFW, 2021).

India's health sector has grown rapidly over the past few years and has employed 4.7 million people by 2015 and another 7.5 Million people were directly employed by 2022. The National Medical Commission Act (2019) recommended the creation of Community Health Providers who would be provided with a limited license to practice preventive and primary care at the mid-level. This cadre is currently operational in the Ayushman Bharat Health and Wellness Centres (AB-HWCs), and recommendations are underway to ensure its complete integration into the primary care team by establishing permanent positions.[48] The Pradhan Mantri Swasthya Suraksha Yojana (PMSSY) has been instrumental in making available the affordable tertiary healthcare facilities and expanding facilities for quality medical education in the underserved states including northeast India in particular. PMSSY, a Central Sector Scheme, is being implemented in a phased manner and has two components, namely Setting up of AIIMS Institutions and Up-gradation of existing Government Medical Colleges/Institutions (GMC/Is) under which expansion of medical infrastructure in the region has received a major boost.

B. Ayushman Bharat or Healthy India: A Holistic Approach

As recommended by the National Health Policy 2017, to achieve the vision of Universal Health Coverage (UHC), Ayushman Bharat was launched with an attempt to move from sectoral and segmented approach of health service delivery to a comprehensive need-based

[48] https://nhsrcindia.org/sites/default/files/2022-05/AB-HWC%20Report%20-%20FINAL%20-%20May%2013.pdf accessed on 10.12.2023

health care service. It is based on a continuum of care approach, comprising of two inter-related components, viz. *Ayushman Bharat-Health and Wellness Centres (AB-HWC)*[49] now called *Ayushman Arogya Mandir* the tagline 'Arogyam Parmam Dhanam and the Pradhan Mantri Jan Arogya Yojana (PM-JAY). The *HWCs* are pivotal in offering screenings for various health conditions. The emphasis of health promotion and prevention is designed to bring focus on keeping people healthy by engaging and empowering individuals and communities to choose healthy behaviours and make changes that reduce the risk of developing chronic diseases and morbidities[50].

India especially northeast India has an inadequate and fragmented delivery of healthcare services. Every year individual patients seek care from a diverse group of healthcare providers increasingly being dominated by the private sector negotiating their own prices for the procedures they undergo. Even among the organized payers, there are multiple schemes. This multiplicity of purchasing platforms, apart from fragmenting risk pools into sub-optimal sizes, prevents standardization of purchasing procedures including insurance has left the poor patients bear a large burden of healthcare expenditure. The average expenditure for private health care in areas is INR 31,845 and the same for public health care services is INR 4452. However the average private health care ependiture for the states of northeast India are higher than the all India average except in the states of Meghalaya and Nagaland.

The *Pradhan Mantri Jan Arogya Yojana* (PMJAY) the second component of Ayushman Bharat provides financial protection for secondary and tertiary care to about bottom 50 percent of India's population. As mentioned earlier out-of-pocket expenditure constitutes more than 60 percent of all health expenses, in a country like India where a large segment of the population is poor. It is estimated that approximately 63 million people fall into poverty every year due to lack of financial protection for their healthcare needs[51]. PM-JAY is the world's largest non-contributory Government-sponsored health insurance scheme

[49] In February 2018, the Government of India announced the creation of 1,50,000 Health and Wellness Centres (HWCs) with the existing Sub Centres and Primary Health Centres at the base as pillar of Ayushman Bharat. These centres delivered Comprehensive Primary Health Care (CPHC) through comunity centric approach by bringing healthcare closer to the homes of people covering both maternal and child health services and non-communicable diseases, including hypertension, diabetes, oral, breast, and cervical cancer free essential drugs and diagnostic services.

[50] The commumity outreach for healthcare is also being provided/ complemented through outreach services, Mobile Medical Units, camps, home and community-based care, based on the principle of seamless continuum of care that ensures equity, universality and no financial hardship.

[51] Healthcare. India Brand Equity Foundation. Retrieved December 15, 2020 from https://www.ibef.org/download/Healthcare-July-2019.pdf.

that enables increased access to inpatient healthcare for poor and vulnerable families in secondary and tertiary facilities[52],[53]. The PM-JAY empanelled hospital network consists of 28,351 hospitals (including 12,824 private hospitals) across the country. In addition around 20 percent of the population (approximately) 25 crore individuals – are covered through social health insurance, and private voluntary health insurance, the remaining 30 percent of the population is devoid of health insurance. This uncovered population or the missing middle comprises of multiple groups across all expenditure quintiles in both urban and rural areas, though they are concentrated in the top two quintiles of rural areas, and top three quintiles of urban areas[54].

The NSSO 75th Round data shows that upto 79 percent of health care expenses are due to the cost of medicines. Thus, access to low-priced generic drugs is very critical in ensuring health care at affordable prices. With a view to achieve the objective of making available quality generic medicines at affordable prices to all, *Jan Aushadhi Scheme* was launched by the Department of Pharmaceuticals, Ministry of Chemicals & Fertilizers, Government of India in November, 2008[55]. It has extended coverage of generic medicines, which has helped to reduce the cost of treatment by providing access to any prescription drug or Over the Counter (OTC) drug in all therapeutic categories as generic equivalents, to serve all. In India, interactions with the healthcare system are patient-initiated, commence with visit to a clinic/doctor/pharmacy when an individual is unwell or feels unwell, and as symptoms abate, they opt out of treatment and follow-ups until the next episode of illness or a new episode of illness or injury emerges[56]. The eight states in the northeast account for

[52] Investment Opportunities in India's Healthcare Sector, NITI Aayog, New Delhi, 2021.

[53] It provides 10.9 crore families, or 49 crore individuals – identified as deprived in the Socio-Economic Caste Census (SECC) 2011 – for fully subsidized health insurance cover and has a national portability feature which allows beneficiaries to avail benefits anywhere in India. with an annual hospitalisation cover of up to INR 500,000 per family.

[54] Health Insurance for India's Missing Middle Publishing Agency: NITI Aayog, New Delhi, 2021. The missing middle predominantly constitutes the self-employed (agriculture and non-agriculture) informal sector in rural areas, and a broad array of occupations – informal, semi-formal, and formal – in urban areas.

[55] The Scheme is being implemented through the Bureau of Pharma PSUs of India (BPPI), under the administrative control of the Department of Pharmaceuticals, Ministry of Chemicals & Fertilizers, Government of India. In September 2015, Jan Aushadhi Scheme was reinforced as Pradhan Mantri Jan Aushadhi Yojana (PMJAY). In November, 2016, to give further impetus to the scheme, it was again renamed as "Pradhan Mantri Bhartiya Janaushadhi Pariyojana" (PMBJP).

[56] Vijayashree Yellapa , Narayanan Devadasan, Anja Krumeich, Nitika PantPai, Caroline Vadnais , Madhukar Pai & Nora Engel (2017) How patients navigate the diagnostic ecosystem in a fragmented health system: a qualitative study from India, Global Health Action,10:1, 1350452, http://dx.doi.org/10.1080/16549716.2017.1350452 (11) (PDF) How patients navigate the diagnostic ecosystem in a fragmented health system: A qualitative study from India. Available from: https://www.researchgate.net/publication/318849758_How_patients_navigate_the_diagnostic_ecosystem_in_a_fragmented_health_system_A_qualitative_study_from_India#fullTextFileContent [accessed Dec 16 2023].

approximately 3.8% of total Indian population and there 1119 empanelled hospitals under PM-JAY which is 3.95 percent (4 percent approximately).

It is important to note that health and health practices are related to social behaviours including lifestyle, food, exercise, stress and behavioural or addictive behaviours relating to drugs, alcohol and tobacco, and environmental pollution. Together with growing incidence of NCD (more than 55 percent of disease burden is due to NCD), the growing prevalence, and complexity of Anti-microbial Resistance (AMR) is another major threat to health[57]. The *Ayushman Arogya Mandir (AAM)* can be one stop agency, which can help in conduct of surveillance for infectious disease, non-communicable disease, occupational health, and injury related conditions at the individual, family and primary care level. The Integrated Health Information Platform (IHIP) under the Integrated Disease Surveillence Programme (IDSP) is partially functional across several states through NHM including the states in northeast India. The experience in Northeast India where approximately 30 percent of the disease burden is due to communicable disease, the IDSP has demonstrated the potential to detect epidemics, issue early warning signals; capture and respond appropriately. There is potential for *AAM* to engage in local level disease survillence/risk assessment/monitoring of health through community involvement and citizen centric electronic health records (EHR) to provide effective and timely health care services.

IV. Healthcare in Northeast India: Transformative Way

The healthcare architecture comprises hospitals, medical devices and equipment, health insurance, clinical trials, telemedicine and medical tourism besides host of healthcare professionals starting from doctors, nurses, specialists, laboratory technicians to other allied personnels. With an ageing population and a growing middle class, these segments are expected to diversify as preference for preventative healthcare is on the rise. Increase of lifestyle diseases resulting from high cholesterol, high blood pressure, obesity, poor diet and addictive beahaviours especially in urban areas call for more of specialised care services. The experience of COVID-19 has brought in changes w.r.t. attitudes in respect of health care awareness, health monitoring and medical check-ups, hygiene, health insurance, fitness and nutrition. The pandemic accelerated the adoption of digital technologies, including

[57] The addition of antibiotics to agricultural feed, use in livestock and poultry contributes to the problem of AMR. Also the effluents discharged from pharmaceutical manufacturing units contribute to AMR development. The Ministry of Health and Family Welfare launched the National Action Plan on AMR (NAP-AMR) in April 2017, emphasizing on the need to tackle AMR on human health, animal husbandry, industry and environment in line with the "One-Health" approach.

telemedicine. There is a growing emphasis on and emergence of Public-Private Partnership models of healthcare based on the recent experience of COVID-19, which showed the criticality of public health care during catastrophic outbreak of epidemics. The envisioning of helath care for states of northeast India, which have made significant progress over the last five years in respect of health, must focuss on:

a. Comprehensive health care for promotive, protective, preventive, curative, rehabilitative, and palliative care prioritizing key health care services aimed at individuals and families through public health functions.

b. Addressing the social, economic and environmental determinants of health through evidence-informed policies.

c. Individuals and communities, as the central focus of all efforts towards provisioning of health care through advocacy and awareness building so as to optimize the health care gains across communities.

d. Governance Issues in health sector including service providers and delivery, health finance, insurance and investment to ameliorate vulnerability due to lack of accessibility, affordability resulting in catastrophic health expenditure.

Northeast India needs to consider redesigning its health service delivery system to foster patient-centeredness, care continuity, coordination across providers and higher quality of care. A far-sighted and pragmatic policy choice can redirect the health system of each of the constituent state and the region at large to a trajectory along the path to higher value. These changes will contribute to improved efficiency, equity and patient satisfaction, and ultimately, better health outcomes.

The ***first* transformative change** required for a Healthy Northeast@47 is with respect to improving service delivery which calls for redesigning of services provided. This would involve:

Surveillance: Public Health Surveillance is the first necessity for public good. Surveillance Information for Communicable/Infectious Diseases, NCD, Occupational Health, Injury and Environmental Health would go a long way to build up the health sector apparatus with multiple stakeholders, including the citizen and the political and bureaucratic leadership at the central, state and district level.

Service delivery for health needs of people: The delivery system shall have to focus on Comprehensive Primary Healthcare (CPHC) through *Ayushman Arogya Mandir (AAM)* and coordinated care across all providers to address both communicable and NCDs and the unfinished communicable disease and maternal and child health.

Cluster organization of AAM and JAK: This step could involve cluster grouping of *AAM* and *JAK* in contiguous areas networked by Panchayat and Local Bodies to ensure maximum outreach to the last mile population to meet their primary health care needs.

Comprehensive Primary Health Care (CPHC): CPHC shall have to be augmented by expanding the roles of non-physicians to free physicians to concentrate on more complex aspects of care in respect of NCDs. The upskilling of existing staff such as ANMs and ASHAs, as well as newly-trained medical graduates with an evidence-based approach to care can ensure quality service. These health workers can become catalytic agents for prevention and disease management activities for common ailments and facilitate access to essential medicines through community engagement.

Care linkages: Care linkages will be the final in this transformative agenda for health and wellness through improved referrals and integrated care pathways between community health workers, primary care providers and hospital based professionals.

The ***second*** **transformative change** shall have to focus on institutional eco-system to create a sustainable delivery apparatus through a shared vision across all stakeholders by strengthening the governance and regulatory system. This could be achieved by:

Governance and Institutions: A framework of multi-stakeholder partnerships among health care providers shall have to be developed by creating a reciprocating eco-system with mutually supportive roles and responsibilities for key actors and incentivized for efficiency and quality output.

Public-private engagement: Public private engagement under an enabling eco-system will facilitate development of delivery models that align private provider behaviours with government objectives and priorities.

Regulatory Framework: An independent and effective regulatory system with strong enforcement capacity will make all service providers accountable for meeting patient safety standards and improving quality of care.

V. The Building Block for Improved Access to Health Care in Northeast India

1. Surveillance and Prevention

The HWCs are long-term, sustainable solutions for conducting surveillance for communicable and non-communicable disease, occupational health conditions at the individual, family and primary care level. The PMJAY can be the point source for collection of information to estimate out-of-pocket expenditure on hospitalisation, and diseases managed within in-patient facilities which shall act as feedback loop for identifying gaps in the delivery system and adopt apropriate course correction measures.

2. Health Care, Manpower and Economy

Expansion of medical education is an important milestone for accelarating healthcare provisioning by 2047 with a complete overhauling of the regulatory architecture in Modern Medicine, Indian Systems of Medicine (Ayurveda, Yoga) and Homeopathy. The reforms of medical education with focus on specific needs of the states in the region especially in PG and super speciality courses launched on a priority basis within 2030 in a time bound framework shall help in bridging the demand –supply gap. This shall address the issues related to growing incidence of communicable and NCD in the region especially ischemic hearth disease, carcinoma, hypertension and diabetes mellitus.

The expansion of health sector is poised to generate additional jobs and economic activity indirectly in the non-health sector of the region. The employment patterns have additional multiplier effects and distributional benefits. First, the health sector can boost female labour force participation especially in the elder care services and other wellness centres. Health and Wellness Centres (*HWCs*) established under *Ayushman Bharat* can be managed by a team comprising a Mid-Level Health Provider (MLP) along with ANMs, ASHAs and a male health worker which will boost newer employment opportunities in the region and extend last mile health care coverage.

The creation of *home healthcare* solutions in the states of Northeast India, which suffer from accessibility issues due to difficult terrains and physical topography, can transform the outreach for the rising elderly population. It can address issues relating to incidence of chronic diseases, and open new opportunities for employment to meet enhanced demand

for constant personalised care with the emergence of nuclear family structures in urban areas of the region.

3. Digitization of Health Care

In his address to the nation on India's 74th Independence Day, the Prime Minister announced

launch of the National Digital Health Mission (NDHM). Digitized health data in the region is of utmost priority given its topographical features. Digitized data system can facilitate flawless exchange by developing registries of public and private facilities, health service providers, laboratories and pharmacies and help in clinical decision.

With the availability of internet and mobile connectivity in the region and ongoing expansion, telemedicine can be the change agent to bring specialized medical services to remote areas, reducing the need for patients to travel long distances to access healthcare in Delhi, Chennai, Bangalore and Hyderabad. It would help in facilitating telemedicine services as well and help patients to share their health profiles with providers for treatment. The digitization of healthcare and health-data management portals can help in easing access through tele/video conferencing and help in reducing travel and logistic cost and thereby reduce out of pocket expenditure. The electronic health record (ECR) for every citizen from birth with a unique id based record needs to be prioritized with data updated from both public and private sector health care services availed to ensure full population coverage with ailment mapping and treatment shortfall/effectiveness to strengthen the health care apparatus.

4. Policy Initiatives and New Opportunities

India's commitment to achieving Universal Health Coverage as part of the SDG is well conceptualized in India's National Health Policy (2017). Towards this end the Government aims to increase spending on health to 2.5% of GDP by 2025. The Policy emphasises upon greater investment in preventative and primary healthcare; access to and financial protection at the secondary and tertiary care levels as well as the provision of free drugs, diagnostics and emergency care services at all public hospitals. The Policy envisages private sector collaboration, including the use of financial and non-financial incentives to encourage participation.

However to achieve a resilient health care infrastructure there is need to spur up health investment. Globally health care spending by government for universal health coverage

(UHC) is on an average 6 (six) percent of the GDP. Global evidences suggest that public spending on health would need to be raised to at least 5 (five) percent of GDP for progressing towards UHC and therefore there is need to step up public health spending in a time-bound manner. The region with its improved connectivity and stable socio-political situation is best suited to become the hub of health investment. Growth in multi-specialty and single-specialty hospitals in Assam has started mainly through private equity (PE) funding. Assam with its better investment climate has seen new partnerships between the state government and corporate houses growing. The improved cancer treatment facilities in the state run B.Barooah Cancer Institute is a case in point.

The region has relative cost competitiveness and availability of skilled labour can usher as an increasingly favoured destination for Medical Value Travel for patients travelling from countries of Southeast Asia and Bangladesh to other far off destinations like New Delhi, Bangalore or Chennai seeking health care services. The recent expansion of public healthcare facilities in the region especially Assam is creating the space for not only an inclusive health service delivery in the region but also leverage itself to take advantage of the captive market in border areas of the neighbouring countries of Myanmar, Bangladesh, Nepal and Bhutan.

5. New Business and Investments in Bio Pharma and Ayush

Northeast India is known for its biodiversity and richness in medicinal and therapeutic plants and herbs. The pharmaceutical sector in India including generic drugs, biopharma, is poised to take a big leap with investments escalating. The region is home to some of the best Ayurvedic and alternative medicine centres in the country and medical tourism can contribute significantly to the region's economy, providing employment opportunities and improving the healthcare infrastructure further[58]. The North Eastern Institute of Ayurveda & Homoeopathy (NEIAH) in Shillong, Meghalaya is an autonomous institute newly established under the Ministry of AYUSH, Government of India. Under the aegis of the National AYUSH Mission (NAM), a total of 1000 new Health & Wellness Centres (HWC) andd 100 AYUSH dispensaries, are opened across the states in the region for growth and development of AYUSH systems. The centres would provide a holistic wellness model based on principles of AYUSH systems of medicine[59].

[58] https://northeastgis.in/wp-content/uploads/2023/05/Sector-Profile_Healthcare_Low-Res_compressed.pdf

[59] The Ministry of AYUSH has initiated upgradation of the Government Ayurvedic College in Guwahati and develop

The region's diverse medicinal flora makes it an ideal location for the pharmaceutical industry. The region's temperate climate is also conducive to growing a variety of crops, including medicinal plants. The region has seen growing investment in its phrama sector[60]. These companies have not only contributed to the growth of the pharmaceutical sector in the region but have also created employment opportunities for the local population. Sikkim has achieved successful investment in the pharmaceutical sector. Assam too has attracted investments from a number of pharmaceutical companies. The region is the future hub of pharmaceutical manufacturing with export potential in biotech pharmaceuticals and products to its neighbouring countries under the aegeis of Act East Policy. The Guwahati Biotech Park offers state of the art research facilities for high-end research to complement research and innovation in bio-pharma industry. The pharmaceutical industry in the neighbouring countries is still in nascent stage and there is a high demand for affordable medicines, which can be met by the investments in pharmaceutical products through an incentivised PPP mode in northeast India.

6. Health Diplomacy

The COVID-19 has revealed the fragility of health care system in the event of a pandemic and the humongous challenges faced by the countries to fight such a catstrophe. This calls for strengthening new areas of diplomacy through health diplomacy. The vaccination support with government-to-government collaborations with individual nations or regional blocks during the pandemic has shown the necessity to collaborate to mitigate any pandemic or health catastrophe faced by the nations. This has opened the way for augmenting affordable and accessible healthcare services (medical value travel, telemedicine, teleconsultation) and products (medical devices of all categories). Northeast India which is projected as the gateway to South East Asia need to take the opportunity to collaborate as well as serve the captive markets alongside integrating health security into the overall national security agenda[61].

Northeast India's forte in providing affordable and quality health care with effective projections on regional forums like BIMSTEC can go a long way for India to push the regional cooperation with neighbouring countries. The developement agenda of northeast India focussing on biotherapeutics, antimicrobial resistance, cancer research and treatment, diagnostics technologies, vaccine technologies, are key areas to be factored into diplomatic cooperation in health sector. This would leverage the states in the region to negotiate their individual healthsector requirements within a geographically proximate region.

VI. Way forward: Health Care service and access in Northeast India

The health information technology (HIT) and Health Information Management System (HMIS) requires developing and strengthening across the states in the region. This can help to meet the specific needs and requirement of different types of health data, based on the common Health Data Dictionary standards such that the data is interoperable and can provide the basis for consistent collection and reporting across the states in the region to strengthen the health care services in the region.

Alongside, the registry of data under Ayushman Bharat Digital Mission (ABDM), Health Professionals Registry and National Health Resource Repository on the number of speciality hospitals, private hospitals, nursing homes, number of beds and specialities in each private hospital across the region require consolidation.

it as a Centre of Excellence. Besides, facilitation centres for semi processing of raw material viz. Regional Raw Drug Repository (RRDR) shall be set up in the region in collaboration with National Institute of Bio-Resources and Sustainable Development in Imphal, under Department of Bio-Technology. These initiatives will be under the Central Sector Scheme of National Medicinal Plants Board, Ministry of AYUSH. The AYUSH medical facilities under different State Governments in the region, teaching hospitals in AYUSH colleges will be brought under AYUSH Health Management Information System (AHMIS) to develop digital data base for various disease management with AYUSH interventions.

[60] Zydus Nutrition Care, Glenmark Pharmaceutical, Swiss Garnier Genexia Ltd., Sangrila Industries Pvt Ltd., Anjali Herbals, SBL Pvt Ltd, Alembic Alkem Lab, Unichem, Sun Pharmaceuticals, Cipla Ltd, Torrent Pharma are few of the

[61] Health diplomacy helps in disease identification, prevention, and responding to health issues. It aids in and providing medical assistance and humanitarian aid during an emergency as seen in the recent Covid-19 pandemic. Health diplomacy in case of northeast India and its Southeast Asian neighbours has the advantage of binding the societies, and giving the region to create a forum with neighbouring countries for leveraging soft powers to promote multidimensional interests including strategic security issues. International responses to H5N1 (2007), H1911 (2009), Ebola (2014), and the COVID-19 pandemic are few examples of health diplomacy success stories. For details see: Mol, R., Singh, B., Chattu, V. K., Kaur, J., & Singh, B. (2022). India's Health Diplomacy as a Soft Power Tool towards Africa: Humanitarian and Geopolitical

A robust surveillance eco-system for both communicable and NCD can deliver optimal results in health outcomes. There is need for integrated surveliance apparatus with both vertical and horizontal integration for real-time data capture from existing health records using an UHID. A citizen centric electronic health record (EHR) process where the individual gets the advantage of all health records from birth to death getting updated both from the public and private sector will aid in real time surveillance and ensure full population coverage. This robust surveillance system shall guide the future pathways for health care provisioning in the region.

Preparedness for Epidemic Outbreaks for communicable disease with re-emergence of known illnesses in different forms (influenza, MDR-TB), or new disease outbreaks (NIPA virus, Corona virus, etc.) with a system of active animal surveillance and integration with agriculture and other sectors is critical. Identifying the sources of infection, block chains of rapid transmission to limit the resulting morbidity, disability or death through an integrated disease surveillence system with neighbouring countries is a strong forte under health Diplomacy. Upgradation of healthcare research and development (R&D) capacity is paramount to transition into a knowledge economy. Northeast India needs to project its priority areas of research and knowledge sharing on areas such as antimicrobial resistance, pathogens, vaccine technologies, biotherapeutics, and technologies for antibodies, diagnostics technologies, early warning systems, and health system preparedness as well as social and economic interventions.

Expansion of private investments in trauma and critical care with specialized expertise, advanced technology, and well-equipped facilities holds promise for the region. Remote areas in northeast India have no access to specialized trauma and critical care facilities. The states in the region have implemented one stop single window system for all G2B permissions required for any business activity. Each state in the region has developed industrial land banks for ease of land allocation and have in place robust feedback and grievance redressal mechanisms to improve ease of doing business. Channelisation of investment through National Single Window Portal shall facilitate faster investment on health care sector in the region.

Strengthened HWC and the AAM shall free up specialists' time such that they can attend to the tasks they have specialised and tide over the deficits in specialized manpower availability. The National Medical Commission Act (2019) recommended the creation of a cadre of workers called Community Health Providers who would be provided with a limited license to practice preventive and primary care at the mid-level[62]. This cadre is currently operational in the Ayushman Bharat Health and Wellness Centres (AB-HWCs), and needs to be integrated into the primary care team by establishing permanent position. Prioritizing successful clinical management of NCDs with the help of general physicians, nurses and community health workers shall help build up a resilient health service delivery.

Health insurance contributes 20 percent to the non-life insurance business, making it the 2nd largest portfolio but is not designed for the *missing middle* as discussed earlier. Contributory insurance products under public private initiative for the missing middle of the states with affordable premium, packaged rates for treatment- both inpatient and out patient cost coverage including medicine and laboratory and diagnostic tests for reducing out of pocket expenditure shall steer health care spending at individual level.

Mental health wellbeing in Northeast India assumes special significance due to complex socio-political situation of long drawn exposure to violence, insurgency and traumatic situations together with inaccessible hilly terrains. Exposure to insurgency, ethnic clashes, human rights violations, and substance abuse throw up challenges in mental health wellbeing. As many as seven states in the region except Sikkim have passed through adverse phases of insurgency and ethnic clashes. Lokopriya Gopinath Bordoloi Regional Institute of Mental Health, Tezpur is the only mental health facility in northeast India. Strategizing and augmenting the service facilities and delivery to address the growing incidence of mental health problems in the region which if left unaddressed would emerge as one of the major stressors in respect of NCD over the years. As per the recommendation of NMHS (2016) the states in northeast India may endeavour to execute a specialized Biennial Mental Health Action Plan, with special provisions outlined for the region to address issues of severe mental disorders, common mental disorders and substance use problems together with growing incidence of suicidal deaths and anxiety disorder especially among the youth[63]. Meghalaya is the only state in the region that has launched a policy on mental health and social care, with special focus on children, adolescence, and youth[64]. The other states in the region need to draw

[62] https://www.indiacode.nic.in/bitstream/123456789/11820/1/A2019_30.pdf

[63] National Mental Health Survey 2015-2016, available at: https://main.mohfw.gov.in/sites/default/files/National%20Mental%20Health%20Survey%2C%202015-16%20-%20Mental%20Health%20Systems_0.pdf

up action plans based on socio-cultural backdrop to address the growing incidence of mental health issues across various age groups in different communities of the region.

Comprehensive medical value tourism (MVT) with a "purpose-driven" and non-siloed approach to medical tourim that facilitate a public private partnership approach is a fast emerging prospect in health care sector. Northeast India is fast emerging as an attractive destination for medical value travellers from Bangladesh and has strong prospect to meet the demand for health care services for countries of East Asia like Cambodia Laos, Monglia and Vietnam (CLMB) besides Myanmar, Nepal and Bhutan. Wellness tourism is growing faster than global tourism, as an increasing number of consumers are incorporating wellness into their travel plans.

Lifestyle disorders due to a combination of rising incomes, fast pace of urbanisation and increased life expectancy has been a major contributor to obesity, cardiovascular diseases, diabetes mellitus and cancer. Together with this an ageing population with a growing middle class and greater longevity is emerging as the major requirement for health care provisioning in the region. This in turn shall act as a catlyst to boost the demand for health services in northeast India as well as increasingly favour growth of wellness and preventative services.

To mitigate the challenges of lifestyle diseases and zoonotic diseases, ***curriculum on health care and healthy living*** needs to be curated from school level with a clear focus on physical and mental well being through yoga, dietary habits and mental health education.

The new approach to social welfare in India is multi-faceted. Encompassing diverse stake holders in the region, and envisioning health care requires shared cooperation among the states of the region, the Ministry of DONER, NEC, private entrepreneurs and corporate houses and people of the region. The region which stands as the gateway to Southeast Asia can leverage its locational advantage for delivering robust healthcare services and coverage not only to the people of the different states in the region but the neighbouring countries in Southeast Asia. India's Health Diplomacy in the Southeast Asian region through Northeast India would create the growth impetus through curated health care services for human resource development.

Annexure

A. Vital Statistics

Table 1: Infant Mortality Rate (IMR)

STATES	2013	2014	2015	2016	2017	2018	2019	2020
ASSAM	54	52	47	44	44	41	40	36
ARUNACHAL PRADESH	32	30	30	36	42	37	29	21
MANIPUR	10	11	9	11	12	11	10	6
MEGHALAYA	47	46	42	39	39	33	33	29
MIZORAM	35	32	32	27	15	5	3	3
NAGALAND	18	14	12	12	7	4	3	4
SIKKIM	22	19	18	16	12	7	5	5
TRIPURA	26	21	20	24	29	27	21	18

Source: National Health Profile/ SRS/ PIB

Table 2: Under 5 Mortality Rate (U5MR)

YEAR	2015	2016	2017	2018	2019	2020
ASSAM	62	52	48	47	43	40

Source: Sample Registration System, Office of the Registrar General of India.

Table 2.1 State wise U5MR

STATES	NFHS (2005-06)	NFHS (2015-16)	NFHS (2019-21)
ASSAM	85.0	56.5	39.1
MEGHALAYA	70.5	39.6	40.0
MIZORAM	52.9	46.0	24.0
MANIPUR	41.9	25.9	30.0
NAGALAND	64.7	37.5	33.0
ARUNACHAL PRADESH	87.7	32.9	18.8
SIKKIM	40.1	32.2	11.2
TRIPURA	59.2	32.7	43.3

Source: NFHS Reports

Table 3: Life Expectancy at Birth

STATES	2019	2015-19	2014-17	2010-14
ARUNACHAL PRADESH	72.4	-	-	-
ASSAM	68.8	67.5	66.2	63.9
MANIPUR	73.5	-	-	-
MEGHALAYA	71.5	-	-	-
MIZORAM	69.6	-	-	-
NAGALAND	72.4	-	-	-
SIKKIM	73.6	-	-	-
TRIPURA	72.8	-	-	-

Source: NFHS/ SRS

Table 4: Maternal Mortality Ratio (MMR)

State/ Year	2004-2006	2007-2009	2010-2012	2011-2013	2014-2016	2015-2017	2016-2018	2017-2019	2018-2020
Assam	480	390	328	237	237	229	215	205	195

Source: Sample Registration System, Office of the Registrar General of India (Retrieved from MoSPI)

B. Nutritional Status

Table 5.1: Nutritional Status of Arunachal Pradesh

Nutritional Status	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
1. Children under 5 years who are stunted (height-for-age)	28.4	27.9	28	24	30.7	29.4
2. Children under 5 years who are wasted (weight-for-height)	10.1	13.6	13.1	11.4	18.8	17.3
3. Children under 5 years who are severely wasted (weight-for-height)	4.7	6.8	6.5	4.2	8.9	8
4. Children under 5 years who are underweight (weight-for-age)	13.1	15.8	15.4	13.8	20.9	19.4
5. Children under 5 years who are overweight (weight-for-height)	9.6	9.7	9.7	*	*	4.9
6. Women whose Body Mass Index (BMI) is below normal (BMI <18.5 kg/m2) (%)	5.6	5.7	5.7	8.7	8.5	8.5
7. Men whose Body Mass Index (BMI) is below normal (BMI <18.5 kg/m2) (%)	6.4	4.6	4.9	8.8	8.1	8.3
8. Women who are overweight or obese (BMI ≥25.0 kg/m2) (%)	28.9	22.9	23.9	25.8	16.3	18.8
9. Men who are overweight or obese (BMI ≥25.0 kg/m2) (%)	32.4	26.6	27.6	26	18.4	20.6

Table 5.2: Nutritional Status of Assam

Nutritional Status	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
1. Children under 5 years who are stunted (height-for-age)	29.8	36	35.3	22.3	38	36.4
2. Children under 5 years who are wasted (weight-for-height)	19.1	22.1	21.7	13.2	17.5	17
3. Children under 5 years who are severely wasted (weight-for-height)	8	9.2	9.1	4.5	6.4	6.2
4. Children under 5 years who are underweight (weight-for-age)	25.9	33.6	32.8	21.4	30.8	29.8
5. Children under 5 years who are overweight (weight-for-height)	8	4.5	4.9	*	*	2.3
6. Women whose Body Mass Index (BMI) is below normal (BMI <18.5 kg/m2) (%)	13.9	18.3	17.6	17.9	27	25.7
7. Men whose Body Mass Index (BMI) is below normal (BMI <18.5 kg/m2) (%)	11.3	13.8	13.4	15.4	21.7	20.7
8. Women who are overweight or obese (BMI ≥25.0 kg/m2) (%)	23.8	13.6	15.2	26.1	10.9	13.2
9. Men who are overweight or obese (BMI ≥25.0 kg/m2) (%)	25.4	14.5	16.2	24.8	10.5	12.9

Table 5.3: Nutritional Status of Manipur

Nutritional Status	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
1. Children under 5 years who are stunted (height-for-age)	20.1	25.1	23.4	24.1	31.4	28.9
2. Children under 5 years who are wasted (weight-for-height)	9.8	10	9.9	6.4	7.1	6.8
3. Children under 5 years who are severely wasted (weight-for-height)	2.6	3.8	3.4	1.8	2.4	2.2
4. Children under 5 years who are underweight (weight-for-age)	12.9	13.5	13.3	13.1	14.2	13.8
5. Children under 5 years who are overweight (weight-for-height)	2.9	3.6	3.4	*	*	3.1
6. Women whose Body Mass Index (BMI) is below normal (BMI <18.5 kg/m2) (%)	6.1	7.9	7.2	8.5	9	8.8
7. Men whose Body Mass Index (BMI) is below normal (BMI <18.5 kg/m2) (%)	7.6	8.3	8	11.5	10.9	11.1
8. Women who are overweight or obese (BMI ≥25.0 kg/m2) (%)	39	31	34.1	31.2	22.4	26
9. Men who are overweight or obese (BMI ≥25.0 kg/m2) (%)	33.4	27.9	30.3	21.8	18.5	19.8

Table 5.4: Nutritional Status of Meghalaya

Nutritional Status	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
1. Children under 5 years who are stunted (height-for-age)	35.1	48.2	46.5	36.5	45	43.8
2. Children under 5 years who are wasted (weight-for-height)	13	12	12.1	13.7	15.6	15.3
3. Children under 5 years who are severely wasted (weight-for-height)	4.6	4.7	4.7	6.5	6.5	6.5
4. Children under 5 years who are underweight (weight-for-age)	22.2	27.3	26.6	22.9	29.9	28.9
5. Children under 5 years who are overweight (weight-for-height)	4.2	4	4	*	*	3.9
6. Women whose Body Mass Index (BMI) is below normal (BMI <18.5 kg/m2) (%)	10.2	11	10.8	11.4	12.3	12.1
7. Men whose Body Mass Index (BMI) is below normal (BMI <18.5 kg/m2) (%)	8.6	9.1	9	13.6	11.1	11.6
8. Women who are overweight or obese (BMI ≥25.0 kg/m2) (%)	17.9	9.7	11.5	18.4	10.2	12.2
9. Men who are overweight or obese (BMI ≥25.0 kg/m2) (%)	30.2	10.6	13.9	17.1	8.1	10.1

Table 5.5: Nutritional Status of Mizoram

Nutritional Status	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
1. Children under 5 years who are stunted (height-for-age)	25.5	31.9	28.9	22.7	33.7	28.1
2. Children under 5 years who are wasted (weight-for-height)	8.3	11.2	9.8	4.5	7.8	6.1
3. Children under 5 years who are severely wasted (weight-for-height)	3.6	6.1	4.9	1.2	3.4	2.3
4. Children under 5 years who are underweight (weight-for-age)	9.3	15.8	12.7	8.5	15.7	12
5. Children under 5 years who are overweight (weight-for-height)	12.1	8.1	10	*	*	4.2
6. Women whose Body Mass Index (BMI) is below normal (BMI <18.5 kg/m2) (%)	4.2	6.8	5.3	7.5	9.6	8.4
7. Men whose Body Mass Index (BMI) is below normal (BMI <18.5 kg/m2) (%)	2.6	8	5.1	6	9.2	7.3
8. Women who are overweight or obese (BMI ≥25.0 kg/m2) (%)	29.7	16.9	24.2	26.8	12.5	21
9. Men who are overweight or obese (BMI ≥25.0 kg/m2) (%)	38.3	24.2	31.9	28.1	10	20.9

Table 5.6: Nutritional Status of Nagaland

Nutritional Status	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
1. Children under 5 years who are stunted (height-for-age)	27.1	34.7	32.7	22.5	30.9	28.6
2. Children under 5 years who are wasted (weight-for-height)	21.7	18.2	19.1	10.1	11.7	11.3
3. Children under 5 years who are severely wasted (weight-for-height)	11	6.8	7.9	3.9	4.3	4.2
4. Children under 5 years who are underweight (weight-for-age)	24.5	27.7	26.9	13.6	17.9	16.7
5. Children under 5 years who are overweight (weight-for-height)	4.8	4.9	4.9	*	*	3.8
6. Women whose Body Mass Index (BMI) is below normal (BMI <18.5 kg/m2) (%)	11.6	10.8	11.1	12.9	11.8	12.3
7. Men whose Body Mass Index (BMI) is below normal (BMI <18.5 kg/m2) (%)	7.4	7.5	7.5	12.8	10.6	11.5
8. Women who are overweight or obese (BMI ≥25.0 kg/m2) (%)	17.1	13	14.4	20.7	13.3	16.2
9. Men who are overweight or obese (BMI ≥25.0 kg/m2) (%)	31	19.8	23.9	16.6	12.1	13.9

Table 5.7: Nutritional Status of Sikkim

Nutritional Status	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
1. Children under 5 years who are stunted (height-for-age)	15.1	25.6	22.3	22.9	32.9	29.6
2. Children under 5 years who are wasted (weight-for-height)	13.2	13.9	13.7	13.2	14.7	14.2
3. Children under 5 years who are severely wasted (weight-for-height)	6.4	6.7	6.6	5.7	6	5.9
4. Children under 5 years who are underweight (weight-for-age)	9	14.9	13.1	12	15.4	14.2
5. Children under 5 years who are overweight (weight-for-height)	3.5	12.2	9.6	*	*	8.6
6. Women whose Body Mass Index (BMI) is below normal (BMI <18.5 kg/m2) (%)	6.1	5.6	5.8	7.5	5.8	6.4
7. Men whose Body Mass Index (BMI) is below normal (BMI <18.5 kg/m2) (%)	5.8	4.4	4.9	1.2	3.3	2.4
8. Women who are overweight or obese (BMI ≥25.0 kg/m2) (%)	41	30.8	34.7	34.1	23.1	26.7
9. Men who are overweight or obese (BMI ≥25.0 kg/m2) (%)	40.1	33.9	36.3	41.5	29.7	34.8

Table 5.8: Nutritional Status of Tripura

Nutritional Status	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
1. Children under 5 years who are stunted (height-for-age)	27.1	33.9	32.3	17.2	26.8	24.3
2. Children under 5 years who are wasted (weight-for-height)	17.1	18.6	18.2	13.4	18	16.8
3. Children under 5 years who are severely wasted (weight-for-height)	5.2	8	7.3	5.3	6.7	6.3
4. Children under 5 years who are underweight (weight-for-age)	16.4	28.3	25.6	21.7	25	24.1
5. Children under 5 years who are overweight (weight-for-height)	9.3	7.8	8.2	*	*	3
6. Women whose Body Mass Index (BMI) is below normal (BMI <18.5 kg/m2) (%)	14.6	16.9	16.2	16.2	20.1	18.9
7. Men whose Body Mass Index (BMI) is below normal (BMI <18.5 kg/m2) (%)	13.2	12.1	12.4	13	17	15.7
8. Women who are overweight or obese (BMI ≥25.0 kg/m2) (%)	29.2	18.4	21.5	23.5	12.8	16
9. Men who are overweight or obese (BMI ≥25.0 kg/m2) (%)	28.3	21.4	23.4	18.2	14.9	15.9

Table 5.9: Nutritional Status of India

Nutritional Status	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
1. Children under 5 years who are stunted (height-for-age)	30.1	37.3	35.5	31	41.2	38.4
2. Children under 5 years who are wasted (weight-for-height)	18.5	19.5	19.3	20	21.5	21
3. Children under 5 years who are severely wasted (weight-for-height)	7.6	7.7	7.7	7.5	7.4	7.5
4. Children under 5 years who are underweight (weight-for-age)	27.3	33.8	32.1	29.1	38.3	35.8
5. Children under 5 years who are overweight (weight-for-height)	4.2	3.2	3.4	*	*	2.1
6. Women whose Body Mass Index (BMI) is below normal (BMI <18.5 kg/m2) (%)	13.2	21.2	18.7	15.5	26.7	22.9
7. Men whose Body Mass Index (BMI) is below normal (BMI <18.5 kg/m2) (%)	13	17.8	16.2	15.4	23	20.2
8. Women who are overweight or obese (BMI ≥25.0 kg/m2) (%)	33.2	19.7	24	31.3	15	20.6
9. Men who are overweight or obese (BMI ≥25.0 kg/m2) (%)	29.8	19.3	22.9	26.6	14.3	18.9

C. Anaemia

Table 6.1: Status of Anaemia in Arunachal Pradesh

Anaemia among Children and Adults	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
1. Children age 6-59 months who are anaemic (<11.0 g/dl) (%)	52.8	57.1	56.6	51	55	54.2
2. Non-Pregnant women age 15-49 years who are anaemic (<12.0 g/dl) (%)	37	41.6	40.8	41.4	44.3	43.5
3. Pregnant women age 15-49 years who are anaemic (<11.0 g/dl) (%)	23.4	28.6	27.9	36.8	38	37.8
4. All women age 15-49 years who are anaemic (%)	36.5	41	40.3	41.2	44	43.2
5. All women age 15-19 years who are anaemic (%)	43.5	49.6	48.5	*	*	48.2
6. Men age 15-49 years who are anaemic (<13.0 g/dl) (%)	21.4	21.5	21.4	15.9	19.7	18.7
7. Men age 15-19 years who are anaemic (<13.0 g/dl) (%)	21.9	25.6	24.9	*	*	22.9

Table 6.2: Status of Anaemia in Assam

Anaemia among Children and Adults	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
1. Children age 6-59 months who are anaemic (<11.0 g/dl) (%)	66.4	68.6	68.4	27.6	36.5	35.7
2. Non-Pregnant women age 15-49 years who are anaemic (<12.0 g/dl) (%)	66	66.4	66.4	44.4	46.3	46.1
3. Pregnant women age 15-49 years who are anaemic (<11.0 g/dl) (%)	41.4	55.9	54.2	37.9	45.7	44.8
4. All women age 15-49 years who are anaemic (%)	65.2	66	65.9	44.2	46.3	46
5. All women age 15-19 years who are anaemic (%)	67.4	67	67	*	*	42.7
6. Men age 15-49 years who are anaemic (<13.0 g/dl) (%)	27.6	37.5	36	17.9	26.8	25.4
7. Men age 15-19 years who are anaemic (<13.0 g/dl) (%)	34.6	40.4	39.6	*	*	23.5

Table 6.3: Status of Anaemia in Manipur

Anaemia among Children and Adults	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
1. Children age 6-59 months who are anaemic (<11.0 g/dl) (%)	44	42.2	42.8	24.9	23.4	23.9
2. Non-Pregnant women age 15-49 years who are anaemic (<12.0 g/dl) (%)	30.5	28.6	29.3	26.4	26.5	26.4
3. Pregnant women age 15-49 years who are anaemic (<11.0 g/dl) (%)	31.7	32.7	32.4	28.5	24.8	26
4. All women age 15-49 years who are anaemic (%)	30.5	28.8	29.4	26.5	26.4	26.4
5. All women age 15-19 years who are anaemic (%)	30.4	26.7	27.9	*	*	21.1
6. Men age 15-49 years who are anaemic (<13.0 g/dl) (%)	5.3	6.5	6	9	9.9	9.5
7. Men age 15-19 years who are anaemic (<13.0 g/dl) (%)	8.5	7.4	7.8	*	*	9.2

Table 6.4: Status of Anaemia in Meghalaya

Anaemia among Children and Adults	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
1. Children age 6-59 months who are anaemic (<11.0 g/dl) (%)	38.8	46	45.1	42.6	48.8	48
2. Non-Pregnant women age 15-49 years who are anaemic (<12.0 g/dl) (%)	52.4	54.9	54.4	45.2	60	56.4
3. Pregnant women age 15-49 years who are anaemic (<11.0 g/dl) (%)	40.2	45.9	45	43.9	54.8	53.3
4. All women age 15-49 years who are anaemic (%)	51.8	54.3	53.8	45.2	59.6	56.2
5. All women age 15-19 years who are anaemic (%)	44.6	54.6	52.5	*	*	52.1
6. Men age 15-49 years who are anaemic (<13.0 g/dl) (%)	16.1	27.4	25.5	19	36	32.4
7. Men age 15-19 years who are anaemic (<13.0 g/dl) (%)	7.4	35	30.1	*	*	25.2

Table 6.5: Status of Anaemia in Mizoram

Anaemia among Children and Adults	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
1. Children age 6-59 months who are anaemic (<11.0 g/dl) (%)	42.8	49.6	46.4	14.1	24.5	19.3
2. Non-Pregnant women age 15-49 years who are anaemic (<12.0 g/dl) (%)	30.8	40.1	34.8	21.2	29.9	24.7
3. Pregnant women age 15-49 years who are anaemic (<11.0 g/dl) (%)	31.9	35.9	34	24.1	30.5	27
4. All women age 15-49 years who are anaemic (%)	30.8	39.9	34.8	21.3	29.9	24.8
5. All women age 15-19 years who are anaemic (%)	30.3	40.8	34.9	*	*	21.3
6. Men age 15-49 years who are anaemic (<13.0 g/dl) (%)	13.3	18.3	15.6	9.8	15.6	12.1
7. Men age 15-19 years who are anaemic (<13.0 g/dl) (%)	23.8	18.9	21.5	*	*	14.4

Table 6.6: Status of Anaemia in Nagaland

Anaemia among Children and Adults	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
1. Children age 6-59 months who are anaemic (<11.0 g/dl) (%)	46.4	41.4	42.7	22	28	26.4
2. Non-pregnant women age 15-49 years who are anaemic (<12.0 g/dl) (%)	27.5	30.3	29.3	25.1	29.3	27.7
3. Pregnant women age 15-49 years who are anaemic (<11.0 g/dl) (%)	22.3	22.1	22.2	31.8	33.1	32.7
4. All women age 15-49 years who are anaemic (%)	27.3	29.8	28.9	25.3	29.5	27.9
5. All women age 15-19 years who are anaemic (%)	34	33.9	33.9	*	*	26.3
6. Men age 15-49 years who are anaemic (<13.0 g/dl) (%)	10.8	9.5	10	11	12.1	11.7
7. Men age 15-19 years who are anaemic (<13.0 g/dl) (%)	15.5	21.6	19.6	*	*	12.2

Table 6.7: Status of Anaemia in Sikkim

Anaemia among Children and Adults	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
1. Children age 6-59 months who are anaemic (<11.0 g/dl) (%)	54.8	57.1	56.4	59.7	52.7	55.1
2. Non-pregnant women age 15-49 years who are anaemic (<12.0 g/dl) (%)	42.2	42	42.1	34.3	35.6	35.2
3. Pregnant women age 15-49 years who are anaemic (<11.0 g/dl) (%)	*	34	40.7	33.6	19.6	23.6
4. All women age 15-49 years who are anaemic (%)	42.4	41.9	42.1	34.3	35.1	34.9
5. All women age 15-19 years who are anaemic (%)	53	43.7	46.7	*	*	48.7
6. Men age 15-49 years who are anaemic (<13.0 g/dl) (%)	15	21	18.7	12.4	18.2	15.9

Table 6.8: Status of Anaemia in Tripura

Anaemia among Children and Adults	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
1. Children age 6-59 months who are anaemic (<11.0 g/dl) (%)	57.3	66.5	64.3	45.7	49.2	48.3
2. Non-pregnant women age 15-49 years who are anaemic (<12.0 g/dl) (%)	66.2	67.8	67.4	55.7	54	54.5
3. Pregnant women age 15-49 years who are anaemic (<11.0 g/dl) (%)	62.1	61.3	61.5	49.8	55.8	54.4
4. All women age 15-49 years who are anaemic (%)	66.1	67.6	67.2	55.6	54.1	54.5
5. All women age 15-19 years who are anaemic (%)	61.7	69.8	67.9	*	*	52.2
6. Men age 15-49 years who are anaemic (<13.0 g/dl) (%)	41.7	34.9	36.9	18.3	27.5	24.7
7. Men age 15-19 years who are anaemic (<13.0 g/dl) (%)	*	24.7	27.2	*	*	22

Table 6.9: Status of Anaemia in India

Anaemia among Children and Adults	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
1. Children age 6-59 months who are anaemic (<11.0 g/dl) (%)	64.2	68.3	67.1	56	59.5	58.6
2. Non-pregnant women age 15-49 years who are anaemic (<12.0 g/dl) (%)	54.1	58.7	57.2	51	54.4	53.2
3. Pregnant women age 15-49 years who are anaemic (<11.0 g/dl) (%)	45.7	54.3	52.2	45.8	52.2	50.4
4. All women age 15-49 years who are anaemic (%)	53.8	58.5	57	50.8	54.3	53.1
5. All women age 15-19 years who are anaemic (%)	56.5	60.2	59.1	*	*	54.1
6. Men age 15-49 years who are anaemic (<13.0 g/dl) (%)	20.4	27.4	25	18.5	25.3	22.7
7. Men age 15-19 years who are anaemic (<13.0 g/dl) (%)	25	33.9	31.1	*	*	29.2

D. Immunization

Table 7.1: Percentage of fully immunised children in the 0-5 years age-group

States	Rural			Urban			Rural + Urban		
	Boys	Girls	All	Boys	Girls	All	Boys	Girls	All
Arunachal Pradesh	34.6	42.5	38.2	57.6	59.4	58.3	38.4	44.8	41.3
Assam	49	42.4	45.9	59.5	31.1	48.5	49.9	41.7	46.1
Manipur	76	69.3	72.7	81.9	79.5	80.7	77.7	72.5	75.1
Meghalaya	46.7	52.7	49.8	66.1	61.9	64	49.8	54	52
Mizoram	75.1	77.2	76.1	63.2	71.3	67.8	71.4	75.1	73.4
Nagaland	13.8	4.2	9.3	27.1	25.4	26.2	16.4	8.7	12.8
Sikkim	66	69.6	67.6	65.5	39.7	53.5	66	64.1	65.1
Tripura	35.2	40	37.4	59.7	41	51.9	39.2	40.1	39.6
All-India	57.1	59.7	58.4	62.4	60.9	61.7	58.5	60	59.2

E. Delivery Care

Table 8.1: Delivery Care of Arunachal Pradesh

Delivery Care	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
Institutional births (%)	90.6	77.3	79.2	81.5	44.1	52.2
Institutional births in public facility (%)	82.1	73.6	74.8	59.5	38	42.7
Home births that were conducted by skilled health personnel (%)	3.2	4.1	4	1.8	2.2	2.1
Births attended by skilled health personnel (%)	93	80.3	82.1	82.8	45.6	53.7
Births delivered by caesarean section (%)	17.1	14.4	14.8	20.1	5.8	8.9
Births in a private health facility that were delivered by caesarean section (%)	56.3	43.8	47.3	42.2	32.8	37.5
Births in a public health facility that were delivered by caesarean section (%)	15	17.4	17	18.1	10	12.5

Table 8.2: Delivery Care of Assam

Delivery Care	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
Institutional births (%)	93.5	82.9	84.1	92.7	68.2	70.6
Institutional births in public facility (%)	66.3	75.4	74.4	61.6	59.8	60
Home births that were conducted by skilled health personnel (%)	2.2	2.6	2.6	1.8	4.1	3.9
Births attended by skilled health personnel (%)	94.9	85.1	86.1	93.9	72.1	74.3
Births delivered by caesarean section (%)	39.2	15.6	18.1	36.8	10.8	13.4
Births in a private health facility that were delivered by caesarean section (%)	78.8	66.9	70.6	65.6	48.3	53.3
Births in a public health facility that were delivered by caesarean section (%)	26.7	13.9	15.2	26.6	11.4	12.9

Table 8.3: Delivery Care of Manipur

Delivery Care	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
Institutional births (%)	92.5	73.9	79.9	86.3	60.5	69.1
Institutional births in public facility (%)	64.5	56.9	59.4	55.3	40.9	45.7
Home births that were conducted by skilled health personnel (%)	3.1	7.1	5.8	5.9	9.1	8
Births attended by skilled health personnel (%)	95.6	80.8	85.6	92.4	69.5	77.2
Births delivered by caesarean section (%)	38	19.7	25.6	33	15.2	21.1
Births in a private health facility that were delivered by caesarean section (%)	57.8	49.6	53.2	52.8	40.9	46.2
Births in a public health facility that were delivered by caesarean section (%)	33.9	19.7	24.7	30	17.6	22.6

Table 8.4: Delivery Care of Meghalaya

Delivery Care	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
Institutional births (%)	82.7	54.3	58.1	88.1	45.7	51.4
Institutional births in public facility (%)	57.4	47.9	49.1	53.1	37.4	39.5
Home births that were conducted by skilled health personnel (%)	2.2	7.3	6.6	2.2	2.6	2.6
Births attended by skilled health personnel (%)	82.4	61.2	64	90.8	48.1	53.8
Births delivered by caesarean section (%)	21.6	6.1	8.2	20.5	5.6	7.6
Births in a private health facility that were delivered by caesarean section (%)	51	34.6	40.8	34.5	29.3	31.4
Births in a public health facility that were delivered by caesarean section (%)	15.2	8.1	9.2	16	8.4	9.8

Table 8.5: Delivery Care of Mizoram

Delivery Care	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
Institutional births (%)	98.8	72.5	85.8	97.2	61.4	79.7
Institutional births in public facility (%)	79.8	67.7	73.8	70.2	56.9	63.7
Home births that were conducted by skilled health personnel (%)	0.3	6.7	3.5	0.8	7.2	3.9
Births attended by skilled health personnel (%)	99.1	76	87.7	97.9	68.5	83.6
Births delivered by caesarean section (%)	16.8	4.8	10.8	19	6	12.7
Births in a private health facility that were delivered by caesarean section (%)	30.7	29.4	30.4	31.4	21.7	30.1
Births in a public health facility that were delivered by caesarean	13.7	5	9.8	15.1	8.8	12.3

Table 8.6: Delivery Care of Nagaland

Delivery Care	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
Institutional births (%)	65	38.8	45.7	56.3	24.3	32.8
Institutional births in public facility (%)	41.5	33.7	35.8	40.1	19.7	25.1
Home births that were conducted by skilled health personnel (%)	11.6	9.9	10.4	10	8.4	8.8
Births attended by skilled health personnel (%)	75.4	48.2	55.3	65.5	32.5	41.3
Births delivered by caesarean section (%)	9.8	3.6	5.2	12.4	3.4	5.8
Births in a private health facility that were delivered by caesarean section (%)	19.7	30.1	23.6	35.7	26	31.5
Births in a public health facility that were delivered by caesarean section (%)	12.5	6.1	8	16.5	11.2	13.4

Table 8.7: Delivery Care of Sikkim

Delivery Care	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
Institutional births (%)	92	96.3	94.7	95.3	94.4	94.7
Institutional births in public facility (%)	66.6	85.6	78.6	77.5	85.2	82.7
Home births that were conducted by skilled health personnel (%)	4	1.9	2.6	2.5	2.4	2.4
Births attended by skilled health personnel (%)	93.5	98.2	96.5	97.7	96.8	97.1
Births delivered by caesarean section (%)	43.1	26.9	32.8	28.8	17.1	20.9
Births in a private health facility that were delivered by caesarean section (%)	*	44	55.4	48.3	50.1	49.3
Births in a public health facility that were delivered by caesarean section (%)	40.4	25.9	30.4	26	14.7	18.1

Table 8.8: Delivery Care of Tripura

Delivery Care	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
Institutional births (%)	94.8	87.5	89.2	92.6	75.7	79.9
Institutional births in public facility (%)	78.2	78.9	78.7	68.7	69.2	69.1
Home births that were conducted by skilled health personnel (%)	1.6	1.1	1.2	1	1.3	1.2
Births attended by skilled health personnel (%)	96.8	87	89.2	93.6	76.8	80.9
Births delivered by caesarean section (%)	47.5	18.6	25.1	45.8	12.2	20.5
Births in a private health facility that were delivered by caesarean section (%)	95.7	54.7	69.3	87.1	57.6	73.7
Births in a public health facility that were delivered by caesarean section (%)	40.4	17.6	22.7	36.4	12.1	18.1

Table 8.9: Delivery Care of India

Delivery Care	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
Institutional births (%)	93.8	86.7	88.6	88.7	75.1	78.9
Institutional births in public facility (%)	52.6	65.3	61.9	46.2	54.4	52.1
Home births that were conducted by skilled health personnel (%)	2.1	3.7	3.2	3	4.9	4.3
Births attended by skilled health personnel (%)	94	87.8	89.4	90	78	81.4
Births delivered by caesarean section (%)	32.3	17.6	21.5	28.2	12.8	17.2
Births in a private health facility that were delivered by caesarean section (%)	49.3	46	47.4	44.8	37.7	40.9
Births in a public health facility that were delivered by caesarean section (%)	22.7	11.9	14.3	19.9	9.3	11.9

F. Screening of Cancer among Adults

Table 9.1 Screening for Cancer among Adults of Arunachal Pradesh

Screening for Cancer among Adults (age 30-49 years)	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
Women						
1. Ever undergone a screening test for cervical cancer (%)	1.4	0.7	0.8	*	*	*
2. Ever undergone a breast examination for breast cancer (%)	0.7	0.3	0.3	*	*	*
3. Ever undergone an oral cavity examination for oral cancer (%)	1	0.5	0.6	*	*	*
Men						
1. Ever undergone an oral cavity examination for oral cancer (%)	1.2	0.7	0.8	*	*	*

Table 9.2 Screening for Cancer among Adults of Assam

Screening for Cancer among Adults (age 30-49 years)	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
Women						
1. Ever undergone a screening test for cervical cancer (%)	0.6	0.1	0.2	*	*	*
2. Ever undergone a breast examination for breast cancer (%)	0.4	0.2	0.2	*	*	*
3. Ever undergone an oral cavity examination for oral cancer (%)	0.4	0.2	0.2	*	*	*
Men						
1. Ever undergone an oral cavity examination for oral cancer (%)	0	1.6	1.4	*	*	*

Table 9.3 Screening for Cancer among Adults of Manipur

Screening for Cancer among Adults (age 30-49 years)	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
Women						
1. Ever undergone a screening test for cervical cancer (%)	2.5	1.9	2.1	*	*	*
2. Ever undergone a breast examination for breast cancer (%)	2.2	1.1	1.6	*	*	*
3. Ever undergone an oral cavity examination for oral cancer (%)	2	0.3	1	*	*	*
Men						
1. Ever undergone an oral cavity examination for oral cancer (%)	1.1	0.6	0.8	*	*	*

Table 9.4 Screening for Cancer among Adults of Meghalaya

Screening for Cancer among Adults (age 30-49 years)	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
Women						
1. Ever undergone a screening test for cervical cancer (%)	0.6	0.6	0.6	*	*	*
2. Ever undergone a breast examination for breast cancer (%)	1.3	0.2	0.5	*	*	*
3. Ever undergone an oral cavity examination for oral cancer (%)	0.4	0.4	0.4	*	*	*
Men						
1. Ever undergone an oral cavity examination for oral cancer (%)	2.3	0.9	1.2	*	*	*

Table 9.5 Screening for Cancer among Adults of Mizoram

Screening for Cancer among Adults (age 30-49 years)	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
Women						
1. Ever undergone a screening test for cervical cancer (%)	9.4	3.3	6.9	*	*	*
2. Ever undergone a breast examination for breast cancer (%)	3.6	1.3	2.7	*	*	*
3. Ever undergone an oral cavity examination for oral cancer (%)	1.4	0.3	0.9	*	*	*
Men						
1. Ever undergone an oral cavity examination for oral cancer (%)	0.2	2.4	1.2	*	*	*

Table 9.6 Screening for Cancer among Adults of Nagaland

Screening for Cancer among Adults (age 30-49 years)	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
Women						
1. Ever undergone a screening test for cervical cancer (%)	0.3	0.3	0.3	*	*	*
2. Ever undergone a breast examination for breast cancer (%)	0.4	0.2	0.3	*	*	*
3. Ever undergone an oral cavity examination for oral cancer (%)	0.6	0.3	0.4	*	*	*
Men						
1. Ever undergone an oral cavity examination for oral cancer (%)	0.1	0.3	0.2	*	*	*

Table 9.7 Screening for Cancer among Adults of Sikkim

Screening for Cancer among Adults (age 30-49 years)	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
Women						
1. Ever undergone a screening test for cervical cancer (%)	0.7	0.5	0.6	*	*	*
2. Ever undergone a breast examination for breast cancer (%)	0	0.2	0.1	*	*	*
3. Ever undergone an oral cavity examination for oral cancer (%)	1.4	0.4	0.8	*	*	*
Men						
1. Ever undergone an oral cavity examination for oral cancer (%)	7.1	2.3	4	*	*	*

Table 9.8 Screening for Cancer among Adults of Tripura

Screening for Cancer among Adults (age 30-49 years)	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
Women						
1. Ever undergone a screening test for cervical cancer (%)	1.2	0.4	0.7	*	*	*
2. Ever undergone a breast examination for breast cancer (%)	0.8	0.2	0.4	*	*	*
3. Ever undergone an oral cavity examination for oral cancer (%)	0.8	0.5	0.6	*	*	*
Men						
1. Ever undergone an oral cavity examination for oral cancer (%)	0	0.3	0.2	*	*	*

Table 9.9 Screening for Cancer among Adults of India

Screening for Cancer among Adults (age 30-49 years)	NFHS 5			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total
Women						
1. Ever undergone a screening test for cervical cancer (%)	2.2	1.7	1.9	*	*	*
2. Ever undergone a breast examination for breast cancer (%)	1.2	0.7	0.9	*	*	*
3. Ever undergone an oral cavity examination for oral cancer (%)	1.2	0.8	0.9	*	*	*
Men						
1. Ever undergone an oral cavity examination for oral cancer (%)	1	1.3	1.2	*	*	*

Public Health Expenditure

Table 10.1 Public expenditure on health by across states (Projected and Actuals) (Amount in Rupees)

State/Union Territory	Arunachal Pradesh	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Sikkim	Tripura	All India
2012-13 (Actual)	28300	153900	33200	39900	22500	37600	24500	31800	7291700
2013-14 (Actual)	35700	171100	41200	45200	34800	30200	25600	40900	7986100
2014-15 (Actual)	59100	192700	57800	57400	41800	41800	26100	59600	10068300
2015-16 (Actual)	53600	286400	48600	64400	45100	46500	26200	61000	11684600
2016-17 (Actual)	70840	319680	47960	81480	49100	49560	28330	69020	13178450
2017-18 (Actual)	93610	451490	58020	144640	66430	61330	46320	78550	14948600
2018-19 (Actual)	111830	466300	49390	110850	65380	63020	40850	93490	16713900
2019-20 (Actual)	101300	544630	66780	91070	65120	66890	42710	90740	18005850
2020-21 (Actual)	243908	592244	65156	131077	77125	72690	46854	105302	19704659
2021-22(Projected)	1756177	20630594	1829724	1939235	1391175	1595627	1877870	3127522	992704800
2022-23(Projected)	1798899	21193386	1836710	1963087	1496770	1718665	1979626	3300333	1179869926
2023-24(Projected)	1919605	22575599	1954076	2056725	1602975	1819550	2124360	3522256	1180633311
2024-25(Projected)	2040312	23957812	2071442	2150362	1709179	1920434	2269095	3744179	1248813232
2025-26(Projected)	2161018	25340025	2188807	2244000	1815384	2021318	2413829	3966102	1316993153
2026-27(Projected)	2281724	26722238	2306173	2337638	1921589	2122202	2558563	4188025	1385173074
2027-28(Projected)	2402430	28104451	2423539	2431275	2027793	2223086	2703297	4409948	1453352995
2028-29(Projected)	2523136	29486664	2540905	2524913	2133998	2323970	2848031	4631871	1521532916
2029-30(Projected)	2643843	30868877	2658270	2618550	2240202	2424855	2992765	4853794	1589712837

**Source: Ministry of Statistics and Programme Implementation (MoSPI)*

**Source: National Health Profile, Central Bureau of Health Intelligence, Directorate General of Health Services, Ministry of Health & Family Welfare, Govt. of India*

Table 10.2 Public expenditure on health by components across states, 2019-20 (Actuals in Rs.'000)

State	Medical and Public Health						Family Welfare						
	UHS	RHS	MERT	PH	Misc.	Total	UFWS	RFWS	MCH	Misc.	Total	Others	Grand Total
Arunachal Pradesh	3430065	4628654	77328	1202599	513690	9852336	9240	80289	0	92186	181715	96212	10130263
Assam	4423527	35330211	8285289	1893122	139215	50071364	44856	2559654	190118	476608	3271236	1120657	54463257
Manipur	905950	3919869	1138346	418699	24173	6407037	1359	123462	0	87728	212549	58800	6678386
Megha-laya	3117258	2229958	71004	491883	2143326	8053429	5070	430386	53403	115885	604744	448386	9106559
Mizoram	1925259	1351989	515680	1595699	5590	5394217	8046	375777	5489	48541	437853	679531	6511601
Nagaland	3858016	1519497	42564	899310	0	6319387	0	346912	0	13181	360093	10000	6689480
Sikkim	2624081	865312	10018	496005	0	3995416	16567	154588	0	85363	256518	19163	4271097
Tripura	4211150	1442338	118258	828821	78106	6678673	28498	0	69589	2220698	2318785	76210	9073668
India	620184386	406822645	208804643	186776371	54188284	1476776329	4707277	58628315	49916732	155778948	269031272	54779450	1800587051

Source: Various State Government Budget Documents

Table 11.3 State Wise No. of Doctors and Paramedical Staffs in different Health Centres, 2022

State	No of Ayush Doctors at PHCs	No of Ayush Doctors at CHCs	Doctors at District Hospital	Doctors at Sub District/Sub Divisional Hospital	Para Medical staff at District Hospital	Para Medical staff at Sub District/Sub Divisional Hospital
achal Pradesh	29	5	315	NA	972	NA
Assam	270	8	789	151	2706	421
Manipur	72	4	232	18	745	28
Meghalaya	64	0	316	17	1507	69
Mizoram	11	1	221	24	955	118
Nagaland	15	0	251	NA	1000	NA
Sikkim	5	0	143	0	422	0
Tripura	83	0	189	127	541	288

Source: Health Statistics India, Various Volumes

Table 11.4 Population Coverage by Health Centres in Northeast India

State	Sub-Centres	PHCs	CHCs
Arunachal Pradesh	3256	9175	20281
Assam	6427	32604	174395
Manipur	5517	29297	271000
Meghalaya	5752	21639	94286
Mizoram	1850	9737	61667
Nagaland	2816	9473	53130
Sikkim	2429	14875	178500
Tripura	2650	23454	120619
NER	5269	26043	126959
All India	5691	36049	164027

Source: Health Statistics India, Various Volumes

Table 11.5 Status of Urban Health Centres in Northeast India as on March, 2022

tes	Required Sub- Centres	Sub-Centres	Shortfall	%	Required PHCs	PHCs	shortfall	%	Required CHCs	CHCs	Shortfall	%
l Pradesh	79	12	67	84.81	8	5	3	36.71	3	0	3	100.00
am	1099	34	1065	96.91	110	90	20	18.09	46	29	17	36.66
ipur	207	23	184	88.87	21	21	0		9	9	0	
alaya	137	0	137	100.00	14	25	+		6	0	6	100.00
oram	135	73	62	45.93	14	9	5	33.33	6	0	6	100.00
land	199	18	181	90.96	20	7	13	64.86	8	0	8	100.00
kim	65	6	59	90.83	7	2	5	69.42	3	0	3	100.00
ura	317	44	273	86.12	32	9	23	71.61	13	2	11	84.86
ER	2238	210	2028	90.62	224	168	56	24.94	93	40	53	57.11
ndia	96176	3894	92282	95.95	9618	6118	3500	36.39	4007	584	3423	85.43

Source: Health Statistics India, Various Volumes

Table 11.6 Status of the Number of Government Hospitals and Beds (Including CHCs) in NER (as on 31/12/21)

States	Total Hospitals (Govt.)		Average Population Served Per Govt. Hospital Beds
	No.	Beds	
Arunachal Pradesh	218	2404	639
Assam	1239	28039	1254
Manipur	13	2707	1172
Meghalaya	157	4557	723
Mizoram	143	1915	637
Nagaland	177	2461	893
Sikkim	33	2260	300
Tripura	157	4948	825
NER	2137	49291	1041
India	60621	849206	1610

Source: Health Statistics India, Various Volumes

Table 11.7 District Hospital, Sub-Divisional Hospital and Medical Colleges in NER (as on 31.3.22)

States	Sub Divisional Hospital (SDH)	District Hospital (DH)	Medical Colleges
Arunachal Pradesh	0	19	1
Assam	14	25	8
Manipur	1	7	2
Meghalaya	2	11	1
Mizoram	2	12	1
Nagaland	0	12	0
Sikkim	1	4	0
Tripura	12	7	1
NER	32	97	14
India	1275	767	315

Source: Health Statistics India, Various Volumes

Table 11.8 Status of Number of AYUSH Hospitals in the Northeast India (as on 01.04.2021)

States	Ayurveda	Unani	Siddha	Yoga	Naturop-athy	Ho-moeop-athy	So-wa-Rigpa (Amchi)	Total
Arunachal Pradesh	10	0	0	0	0	2	0	12
Assam	1	0	0	0	0	3	0	4
Manipur	6	5	0	5	0	9	0	25
Meghalaya	4	0	0	0	0	8	0	12
Mizoram	1	0	0	0	0	1	0	2
Nagaland	2	0	0	2	0	2	0	6
Sikkim	2	0	0	1	0	2	1	6
Tripura	3	0	0	1	0	3	0	7
NER	29	5	0	9	0	30	1	74
All India	2963	254	290	16	29	247	2	3801

Source: Health Statistics India, Various Volumes

Table 11.9 Status of Number of AYUSH Dispensaries in the Northeast India (as on 01.04.202)

States	Ayurveda	Unani	Siddha	Yoga	Naturop-athy	Homoe-opathy	Sowa-Rig-pa (Amchi)	Total
Arunachal Pradesh	33	1	0	0	0	100	2	136
Assam	524	0	0	0	0	87	0	611
Manipur	0	0	0	0	0	1	0	1
Meghalaya	40	0	0	2	0	55	0	97
Mizoram	2	0	0	0	0	28	0	30
Nagaland	10	0	0	2	0	34	0	46
Sikkim	1	0	0	0	0	12	0	13
Tripura	37	0	0	0	0	73	0	110
NER	647	1	0	4	0	390	2	1044
All India	24912	1707	851	190	77	8297	34	36068

Source: Health Statistics India, Various Volumes

I. Key findings on Health from NSSO 75th Round

Table 12.1 % of Persons that Responded as Ailing (PPRA) in Northeast India

States	Percentage of ailing persons in a 15-day period								
	Rural			Urban			Rural + Urban		
	M	F	all	M	F	all	M	F	all
Arunachal Pradesh	3.2	2.4	2.8	4.2	3	3.6	3.4	2.5	2.9
Assam	2.1	2.4	2.2	2.7	6	4.3	2.2	2.8	2.5
Manipur	1.4	2.2	1.8	2.2	1.7	2	1.7	2.1	1.9
Meghalaya	0.4	0.4	0.4	0.2	0.1	0.1	0.4	0.3	0.4
Mizoram	4.7	2	3.4	3.1	3.9	3.5	4	2.9	3.4
Nagaland	0.2	0.9	0.5	2.4	0.6	1.6	0.8	0.8	0.8
Sikkim	1.9	3.4	2.6	6.2	6.5	6.3	2.9	4	3.4
Tripura	3.4	2.3	2.9	3.3	4.2	3.7	3.4	2.7	3.1
All-India	6.1	7.6	6.8	8.2	10	9.1	6.7	8.3	7.5

Table 12.2 Average medical expenditure incurred for treatment during stay at hospital per case of hospitalization (in Rupees)

States	Government/public hospital			Private hospitals			All (incl. NGO, trust-run)		
	Rural	Urban	R + U	Rural	Urban	R + U	Rural	Urban	R + U
Arunachal Pradesh	3793	4810	3952	13966	23497	15469	4504	6092	4754
Assam	4545	7842	4991	28785	71657	44204	9826	38935	15661
Manipur	5932	9051	6944	60361	39541	49784	14170	17505	15366
Meghalaya	1894	7668	2385	14870	35687	27375	2790	22711	6041
Mizoram	5622	7528	6415	19558	47740	39578	7260	17371	12109
Nagaland	4648	5089	4748	13098	19699	16953	6020	12109	7978
Sikkim	3339	2915	3266	24805	19168	23201	7180	7703	7282
Tripura	3314	6077	3752	64017	67139	65326	5161	13400	6574
All-India	4290	4837	4452	27347	38822	31845	16676	26475	20135

Table 12.3 Average medical expenditure per spell of ailment for non-hospitalised treatment during a 15-day period

States	Rural			Urban			Rural + Urban		
	M	F	all	M	F	all	M	F	all
Arunachal Pradesh	1201	1233	1214	2017	2236	2097	1370	1417	1388
Assam	1064	853	963	1193	743	895	1089	816	944
Manipur	1071	1064	1067	1580	1121	1345	1270	1084	1171
Meghalaya	1240	187	661	1601	0	1162	1265	182	683
Mizoram	603	584	600	1088	1045	1065	787	942	843
Nagaland	813	164	444	1304	690	1148	1168	376	868
Sikkim	707	474	545	937	630	763	805	520	620
Tripura	993	1092	1037	1648	1139	1339	1134	1108	1121
All-India	621	567	592	711	710	710	655	621	636

J. Pradhan Mantri Jan Arogya Yojana (PMJAY) & Jana Aushadhi Kendra (JAK)

Table 14: Total Jana Aushadhi Kendra in NER

SL No.	State	Number of PMBJK Functional
1	Arunachal Pradesh	29
2	Assam	121
3	Manipur	38
4	Meghalaya	18
5	Mizoram	12
6	Nagaland	20
7	Sikkim	5
8	Tripura	25
9	Total	268

Source: Health Statistics India, Various Volumes

K. State Health Insurance Schemes

Name of the Scheme	State Covered	Features
Chief Minister Arogya Arunachal Yojana	Arunachal Pradesh	Benefits: Coverage of upto 5 lakhs per family per year. Cashless treatments in case of hospitalization. Pre-Existing diseases coverage. Pre-hospitalization expenses and post-hospitalization expenses coverage. Beneficiaries: ASPT members. Non- APST residents of Changlang, Lohit &Namsai. State Govt. Employees and their dependents.
Assam Arogya Nidhi (AAN)	Assam	Provides financial assistance up to Rs. 1,50,000/- to BPL families and families having a monthly income of less than Rs. 10,000/- (Rupees Ten Thousand) for general and specialized treatment of (i) life threatening diseases, (ii) of injuries caused by natural and manmade disasters, such as industrial/farm/road/rail accidents, bomb blasts etc. Life threatening diseases includes heart diseases and heart surgery, Cancer, Kidney and Urinary diseases, Orthopaedic, Thalassemia, Bone marrow Transplant, AIDS, and chronic Mental Illness with Surgical Treatment. Under the AAN, Government of India contributes 50% of the funds sanctioned by the State Government. As on date, 822 patients have availed the benefits of the Assam Arogya Nidhi.
Free operations for children having congenital heart disease	Assam	The Government will bear the expenses of surgery for children born to permanent residents of Assam who have been recommended surgery for congenital heart disease w.e.f. 01-07-2010. The Government bear the air fare from Guwahati, of the child and one guardian to and from the designated referral Hospital, besides providing adequate accommodation facility in or close to the hospital for the guardian during the hospitalisation period of the child.

Operation Smile	Assam	Free Surgery for children having cleft palate and lip. Department of Health & Family Welfare, Government of Assam, NHM and Operation Smile jointly initiated a special drive for Cleft lip and Cleft Palate patients in the year 2009. Total 11,860 nos. of children having cleft lip has been operated under "Operation Smile" since inception till 14th July 2014.
Ayushman Asom-Mukhya Mantri Jan Arogya Yojana	Assam	AA-MMJAY is a family floater health assurance scheme. The scheme provides cashless medical benefit upto Rs. 5 Lacs per family per year in empanelled hospitals. The scheme has 1949 medical procedure covering 27 specialities. Under the scheme, left out National Food Security families over and above 30 lacs AB-PMJAY families are included. Approximately 26 lacs families to be under "Ayushman Asom-Mukhya Mantri Jan Arogya Yojana" (AA-MMJAY). Total 323 hospitals are empanelled under the scheme of Ayushman Asom- Mukhya Mantri Jan Arogya Yojana.1949 procedures covering under 27 specialities are available under AA-MMJAY. e-KYC campaign of AA-MMJAY is ongoing across all districts of Assam. Government frontline workers like ASHA workers, MPWs, Bima Sakhis, DigipaySakhis are authorised to conduct house to house and camp mode e-KYC in the districts of Assam.
Sneha Sparsha	Assam	Sneha Sparsha is an unique Health Care Initiative for Children below 12 years of age launched by the Department of Health & Family Welfare, Government of Assam. The scheme, being implemented by NHM, Assam, was flagged off on 15 th April 2013, the first day of Assamese New Year, with an allotted fund of Rs 5 Crore for the Fiscal Year 2013-14. Sneha Sparsha is a striving public health initiative that aims at bearing expenditure of very high-end specialized treatment such as Thalassemia requiring Bone Marrow Transplant, Liver and Kidney transplant, and Cochlear Implant.
Susrusha - Financial Assistance for Kidney Transplantation	Assam	Under 'Susrusha' scheme, an amount of Rs. 1.00 Lakh is given as financial assistance to people who have undergone Kidney transplantation after 1st April 2010. Any person who is a resident of Assam and annual income of the person or his family does not exceed 3.00 lakh is eligible under the Scheme.

Chief Minister- Gi Hakshelgi Tengbang (CMHT) Scheme	Manipur	The CMHT scheme covers cashless health protection up to Rs 5. Lakh per family per year. By producing the CMHT-Manipur Health card at the empanelled hospitals, a beneficiary can get cashless treatment (Without making any payment to the empanelled hospitals) up to Rs. 5 Lakh for secondary and tertiary healthcare per year per enrolled family on a floater basis. The benefit will be applicable to hospitalization procedures only. The scheme also provides travel allowance benefits within and outside the state to the beneficiaries.
Megha Health Insurance Scheme (MHIS)	Meghalaya	Megha Health Insurance Scheme was launched in 2012. The Government of Meghalaya via the State Nodal Agency began the implementation of MHIS in convergence with the RashtriyaSwasthiya Bima Yojana (RSBY) in 2013. The insurance cover was increased to 1.6 lakhs for all citizens of the state (excluding state and central government employees). Subsequently, the insurance cover has increased over the years - to 2.0 Lakhs in MHIS 11, 2.8 Lakhs in MHIS Ill (plus 30,000 senior citizen cover for enrolled senior citizens), and 5 Lakhs in MHIS IV and now to 5.3 Lakhs in MHIS V. An increased insurance cover of per family per year, inclusive of t 30,000 OPD cover. No limits on the family size and the scheme continues to cover pre-existing diseases. Increased number of over 3000 procedures under 2,264 packages. Beneficiaries can utilize the benefits at any empanelled hospital across the country.
Mizoram State Health Care Scheme (MSHCS)	Mizoram	Mizoram Government Scheme, up to ₹2,00,000/- for most admitted diseases and some OPD treatment. MSHCS registrants are entitled to medical treatment cost per family for one year ₹2,00,000/- can be billed.

Tripura Health Assurance Scheme for Poor (THASP)	Tripura	The Tripura Health Assurance Scheme for Poor (THASP) is offered on a family floater basis. The maximum sum assured is Rs.1.15 lakh. If the treatment at the listed hospital crosses the ceiling limit, then the patient will have to bear the additional expenses. The scheme includes coverage of transportation expenses from Agartala to the listed hospital and back. The maximum coverage of the transportation expenses is Rs.10,000. The expenses for the treatment up to Rs.1.15 lakh will be paid directly to the listed hospital. With regard to financial assistance for transportation, the amount will be advanced from the scheme either via a bank draft or directly to the account of the beneficiary.
Chief Minister Health Insurance Scheme (CMHIS)	Nagaland	All beneficiaries of the scheme are entitled to free and cashless hospitalization care for various ailments. The treatment will include both surgical and medical procedures and limited day-care packages. However, OPD services and standalone diagnostics investigations will not be covered. CMHIS (GEN) beneficiaries will be entitled to more than 1950 medical and surgical packages across 27 major clinical specialties as well as entitlement to General Ward, similar to AB PM-JAY. For CMHIS (GEN) beneficiary families, the Sum Insured is Rs. 5,00,000/- (Rupees Five Lakhs Only) per family per annum on a family floater basis, similar to AB PM-JAY. For CMHIS (EP) beneficiary families, the Sum Insured is Rs. 20,00,000/- (Rupees Twenty Lakhs Only) per family per annum on a family floater basis.
Sikkim Su Swasthya Yojana	Sikkim	It provides cashless health care services to government employees of Sikkim and their dependents. It provides healthcare cover up to Rs. 10 lakhs and an additional Rs 10 lakh as critical care cover. It covers expensive treatments like IVF, trauma care, critical illnesses, and cancer from day one after enrolment. There is no age limit for physically or mentally challenged children, siblings, or unmarried unemployed dependent daughters. Pre-existing illnesses are also covered from Day one after successful enrolment under the scheme. The scheme also covers expenses incurred for organ transplantation.

Mukhya Mantri Jeevan Raksha Kosh Scheme	Sikkim	This scheme provides financial support to individuals apart from the BPL population who are recommended by the State Medical Board. Financial support is provided for individuals who are looking to seek treatment outside the state. The scheme provides financial assistance for the beneficiaries up to a maximum amount of Rs.2 lakh. The scheme provides cashless treatment for those who require it. In order to avail the services, the beneficiaries are required to provide a referral certificate issued by the State Medical Board along with attested copies of the Sikkim Subject Certificate or Certificate of identification.
Mukhya Mantri Shrawan Shakti Samridi Yojana	Sikkim	This scheme is aimed at specifically catering to individuals with hearing impairment by providing them with hearing aids. To avail the service, individuals are required to visit the STNM Hospital - Ear, Nose, and Throat Clinic in Gangtok.
Sikkim State Illness Assistance Fund	Sikkim	This scheme provides financial aid to individuals outside the state living below the poverty line. The scheme provides patients with cashless treatment facilities up to Rs.1.5 lakh. If the treatment sought by the beneficiaries goes beyond the Rs.1.5 lakh limit, funding will be provided by the Central Government. To avail the services, individuals are required to submit a BPL certificate. Cashless treatment can be sought only in government-run hospitals and healthcare facilities.

L. Medical Education

Table 16.1 State-wise doctor-population ratio for 2020

State	Doctor population Ratio per 1000	Need Availability Gap
Arunachal Pradesh	0.78	0.22
Assam	0.7	0.3
Mizoram	0.08	0.92
Nagaland	0.06	0.94
Sikkim	2.13	NA
Tripura	0.49	0.51

Source: CBHI (2021), CMIE States of India

Table 16.2 State-wise doctor-population ratio for 2020 (active workforce)

State	Doctor - Population Ratio		
	Allopathic Doctors	Allopathic Doctors + Dental surgeons	Allopathic doctors + Dental surgeons + AYUSH practitioners
Arunachal Pradesh	0.62	0.76	0.99
Assam	0.56	0.63	0.68
Nagaland	0.05	0.07	0.12
Mizoram	0.07	NA	NA
Sikkim	1.7	1.76	NA
Tripura	0.39	0.43	0.53

Source: CBHI (2021)

Table 16.3 State-wise PG-UG Ratio (2020–21)

State	PG- UG Ratio (Total)	PG- UG Ratio (Public)	PG- UG Ratio (Private)
Arunachal Pradesh	0	0	No Private sector and no PG
Assam	0.78	0.78	No Private sector and no PG
Manipur	0.93	0.93	No Private sector
Meghalaya	0.58	0.58	No Private sector
Mizoram	0	0	No Private sector and no PG
Nagaland	NA	NA	NA
Sikkim	0.22	No Public Sector	0.22
Tripura	0.37	0.63	0.05

Source: Indiastat

Table 16.4 Trends in expenditure on medical education, training and research

State	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Arunachal Pradesh	0.98	9.21	7.25	16.76	1.54	0.96
Assam	14.44	26.32	19.27	21.57	16.86	19.68
Manipur	16.01	13.83	16.41	17.23	17.41	29.21
Meghalaya	0.63	0.77	0.83	1.61	0.67	0.97
Mizoram	2.14	3.39	16.99	8.29	9.12	7.38
Nagaland	0.99	0.7	11.09	0.69	0.7	0.41
Sikkim	0.66	0.87	0.76	12.82	3.14	24.64
Tripura	5.66	5.14	4.28	3.28	2.69	1.64

Source: CAG Combined Finances

Table 16.5 Seats per College: State-wise analysis (2022-23)

State	Seats per college (Total)	Seats per College (Public)	Seats per College (Private)
Arunachal Pradesh	50	50	0
Assam	128	128	0
Manipur	125	113	150
Meghalaya	50	50	0
Mizoram	100	100	0
Nagaland	0	0	0
Sikkim	150	0	150
Tripura	113	125	100

Source: Lok Sabha Questions

Table 16.6. Comparison of the relative share of states in UG seat pool with their relative share in the population

State	Relative Seat share in Total (in %) (2017–18)	Relative Seat share in Total (in %) (2022–23)	Share in the population (2022-23)
Arunachal Pradesh	0	0.1	0.1
Assam	1.1	1.3	2.6
Manipur	0.3	0.4	0.2
Meghalaya	0.1	0.1	0.2
Mizoram	0	0.1	0.1
Nagaland	*	*	0.2
Sikkim	0.1	0.2	0.05
Tripura	0.3	0.2	0.3

Source: IndiaStat and Registrar General of India

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