**Challenges of Rural Healthcare Infrastructure: A Study among North-Eastern States of India**

**Manuranjan Gogoi1**

Guest Faculty, Department of Economics, Madhabdev University, Narayanpur, Assam

**Dr. Sarat Hazarika2**

Registrar i/c, Madhabdev University, Narayanpur, Assam

**Dr. Khirod Kr. Phukan3**

Assistant Professor, Department of Economics, Madhabdev University, Narayanpur, Assam

**Purabi Gogoi4**

Assistant Professor, Department of Economics, T.H.B. College, Jamugurihat, Sonitpur, Assam

Corresponding Email: [manuranjan7@gmail.com](mailto:manuranjan7@gmail.com)

Phone: +919859471709

**Abstract**

Health service is very important for the socio-economic upliftment of a country. Every citizen of a nation wants a better healthcare service to maintain their hygienic life. In India there is always facing a shortfall of healthcare services mainly in rural areas of the country. Therefore, the present study is trying to examine the current status of rural healthcare infrastructure of the nation especially in the North-Eastern Region (NER) of India i.e. the states Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim. It also aims to make a comparative analysis of healthcare infrastructure among NER states. The study is solely based on secondary data and collected from different sources of Government of India.

**Keywords:** *rural**healthcare infrastructure, Challenges of Healthcare, North-East India*

**Introduction**

Health is one of the most important indicators of human development index after Education and standard of living (UNDP). A good health not only provides a hygienic life but also provides better work efficiency in the labour market. The growth of the health care infrastructure is important for its enhancement of economic development of a nation. According to (WHO, 2000) for a very long time, the main objective of most of the developing countries is to develop the health status of their citizens. In a broad sense, it is a contributor of enhance the expectancy of life and economic participation that leads to alleviation of poverty of a region.

For any economic activities infrastructure is necessary. So, it is defined, Infrastructure is the social capital or basic services of a country which make possible economic and social activities (Rutherford, 2002). There is a vast change seen in the twenty first century in India, but still the nation is deprived for its infrastructure development as compared to other nations of world. Mainly the country still poor for its health sector compared with other developing countries of Asia i.e. China, Sri-Lanka and Bangladesh. In the sense of health indicators like infant mortality, life expectancy of birth, mortality under age five, India is still poor compared with the countries that mentioned above (GOI, 2005). For the development of health status of the citizens of the country there is a need of adequate health care infrastructure. According to Rural Health Statistics (RHS) 2018-19, Govt. of India, the total number of Sub Centres (SCs) is 160713 (157411 rural + 3302 urban) and they are functioning. Similarly, 30045 Primary Health Centres (PHCs) is functioning in India (24855 rural + 5190 urban) and there are 5685 Community Health Centres (CHCs) (5335 rural + 350 urban) functional in the country. But the current numbers of SCs, PHCs & CHCs are not as per IPHS norm.

**Data Source**

The paper based on secondary data only. Data has been collected from different source such as Rural Health Statistics (RHS)- 2018-19 published by Government of India Ministry of Health and Family Welfare Statistics Division, SRS Bulletin published by Office of The Registrar General, India, India HIV Estimates 2019 Report, published by National aids control organization, ICMR – National Institute of Medical Statistics, Ministry of health & family welfare government of India and Database of Government of India (https://data.gov.in).

**Present Health Status of North-East India**

The rural health care infrastructure of NER of India is still weaker than the states of the country. But after implementation of NRHM, in 2005 there is a significant improvement seen in the region for its healthcare infrastructure (Saikia, 2014). To analyze the current health status of NER, India the study focused on four indicators like- Birth Rate (BR), Death rate (DR), Natural Growth Rate (NGR) and Infant Mortality Rate (IMR) of the region. The following table 1 shows the four indicators that presented separately and categorized each of the indicators like- Total (T), Rural (R) and Urban (U). Total Birth rate of Assam and Meghalaya is more than of national level (India). The same result is happen in case of rural birth rate also, but only urban birth rate of all the states of north-east is lower than all India level (16.8). In case of death rate, total death rate of Assam (6.5) is higher than all India level (6.3). On the other hand rural death rate of all the states of NER is better position in all India level (6.9) but in case of urban death rate the states Assam and Manipur are in the same position with all India level (5.3) and the remaining six states are quite better positions than all India level. Natural growth rate of Assam and Meghalaya is greater than national average also the same condition in the rural sector. But in urban NGR of Sikkim (14.9) is greater than all India average (11.6). In case of IMR the states Assam, Arunachal Pradesh and Meghalaya is shown the higher IMR than all India level(33) but the IMR of the remaining states is quite good than all India average. The state Nagaland is the most favored sates with lowest IMR (7) among all the states of NER, India. The rural IMR of Assam, Arunachal Pradesh and Meghalaya is also higher than all India average, but in case of urban IMR the states Arunachal Pradesh, Meghalaya and Tripura is in bad position than all India average. It is also mentionable that, the rural IMR (37) of India is higher than urban IMR (23), resulted an inadequate health infrastructure of rural India.

**Table 1: Estimated Birth rate, Death rate, Natural growth rate and Infant mortality rate, 2017**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **States** | **BR** | | | **DR** | | | **NGR** | | | **IMR** | | |
| **T** | **R** | **U** | **T** | **R** | **U** | **T** | **R** | **U** | **T** | **R** | **U** |
| Arunachal Pradesh | 18.3 | 18.8 | 15.5 | 6.1 | 6.4 | 4.9 | 12.1 | 12.4 | 10.6 | 42 | 44 | 34 |
| Assam | 21.2 | 22.4 | 14.7 | 6.5 | 6.7 | 5.3 | 14.7 | 15.7 | 9.4 | 44 | 46 | 21 |
| Manipur | 14.6 | 14.8 | 14.1 | 5.3 | 5.3 | 5.3 | 9.3 | 9.5 | 8.8 | 12 | 13 | 9 |
| Meghalaya | 22.8 | 24.8 | 13.7 | 6.1 | 6.3 | 4.8 | 16.7 | 18.5 | 8.8 | 39 | 41 | 25 |
| Mizoram | 15.0 | 17.7 | 12.2 | 4.0 | 4.0 | 4.1 | 11.0 | 13.8 | 8.0 | 15 | 20 | 7 |
| Nagaland | 13.5 | 14.0 | 12.7 | 3.6 | 4.2 | 2.7 | 9.9 | 9.8 | 9.9 | 7 | 7 | 7 |
| Sikkim | 16.4 | 15.2 | 18.3 | 4.5 | 5.3 | 3.4 | 11.9 | 9.9 | 14.9 | 12 | 13 | 9 |
| Tripura | 13.0 | 14.1 | 10.3 | 5.2 | 5.2 | 5.2 | 7.8 | 9.0 | 5.1 | 29 | 28 | 32 |
| **India** | **20.2** | **21.8** | **16.8** | **6.3** | **6.9** | **5.3** | **13.9** | **15.0** | **11.6** | **33** | **37** | **23** |

Note: Infant mortality rates are based on three-year period 2015-17.

Source: SRS Bulletin, Office of The Registrar General, India

The health status of North-East India cannot be equally treated as shown in the table 1. This is because of the inadequate development of the health infrastructure or its unavailability of adequate manpower in the health sector. Poor conditions of health infrastructure of the country means, there is a problem of non-availability of free medicines for rural poor, non-availability of good doctors and lack of sufficient number of government hospitals in rural areas of the country (Das, 2012).

Another serious health problem not only for North East India, but also the problem of whole world is Acquired Immune Deficiency Syndrome (AIDS) disease. Still there are no proper medicines invented of this disease to curing it. Just only few preventive measures and active awareness among citizens can reduce it to spreading the disease. The present scenario of AIDS mortality of North-Eastern states and other Indian states/UTs represents the figure 1 below-

**Figure 1: AIDS Mortality by State/UT, 2019 (per 100,000 population)**

Source: India HIV Estimates-2019, Govt. of India

Figure 1 shows, AIDS related mortality of India at 4.43 per 100,000 population in India.

State wise AIDS related mortality of per 100,000 population, the three north-eastern states estimated to be in highest position all over India i.e. – Manipur (36.86), Mizoram (28.34) and Nagaland (26.2). This means inadequate health awareness of AIDS disease among the citizens of the states. Similarly, Meghalaya (11.08) is also in fifth position after Andhra Pradesh (21.76) and Pondicherry (15.33). On the other hand, it is reflected in the figure; the states Assam (1.67), Arunachal Pradesh (1.14), Sikkim (0.64) and Tripura (0.46) are somewhere is in better position and below the level of all India average (4.43). India HIV Estimates report 2019 also mentioned that, the HIV-AIDS detected persons are gradually increasing all over the country. So it is a major concern for all human being. In this regards there is a need of sufficient health infrastructure in the region as well.

**Healthcare Infrastructure of North-East India**

The healthcare infrastructure in rural areas of India has been developed as a three tier system i.e. - Sub Centres (SC), Primary Health Centres (PHCs) and Community Health Centres (CHCs). These three are the common health infrastructure of rural society. Mainly SCs and PHCs are the first and foremost choice of health care among the rural civilian. Because these centres are situated in village level and they are nearest from the households. For critical cases people preferred to go CHCs those are located mainly in semi-urban areas. The following table 2 shows the rural population and average rural population covered by the health sector in NER.

**Table 2: Average rural population covered by SCs, PHCs and CHCs**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sl. No | State | Rural Population 2011 Census | Estimated mid-year Population 2019 (as on 1st July 2019) in Rural Areas | Average Rural Population [mid-year population as on 1st July 2019] covered by a | | |
| SC | PHC | CHC |
| 1 | Arunachal Pradesh | 1066358 (77.06)\* | 1133000  (75.18)\* | 2,943 | 7,923 | 17,984 |
| 2 | Assam | 26807034 (75.90)\* | 29208000 (84.88)\* | 6,291 | 30,875 | 1,65,017 |
| 3 | Manipur | 2021640 (70.79)\* | 2132000  (68.53)\* | 4,351 | 23,689 | 92,696 |
| 4 | Meghalaya | 2371439 (79.93)\* | 2569000  (79.48)\* | 5,386 | 21,771 | 91,750 |
| 5 | Mizoram | 525435  (47.88)\* | 547000  (45.77)\* | 1,478 | 9,271 | 60,778 |
| 6 | Nagaland | 1407536 (71.17)\* | 1281000  (59.44)\* | 2,958 | 10,167 | 61,000 |
| 7 | Sikkim | 456999  (74.84)\* | 389000  (58.49)\* | 2,210 | 13,414 | 1,94,500 |
| 8 | Tripura | 2712464 (73.83)\* | 2595000  (64.84)\* | 2,670 | 24,028 | 1,44,167 |
| 9 | India | 833748852  (68.85)\* | 884021000  (66.09)\* | 5,616 | 35,567 | 1,65,702 |

Note; \*: Percentage share of population to the total population.

Source: Rural Health Statistics 2018-19, Govt. of India

Table 2 shows the rural population of all the NE states in the year of 2011 and 2019. It also shows the average number of population covered by the health services of those states. In case of SCs only Assam is in better position than the national average. Similarly, the conditions of PHCs of all the NE states are very poor and it was lower than national average. On the other hand, in case of CHCs only Sikkim is in better position than national average.

**Challenges Faced by the Rural Healthcare Infrastructure of North-East India**

**Position of SCs, PHCs and CHCs**

Rural healthcare services of North-eastern states of India facing many problems since many decades but in some aspects the states of the region are in a good position than the other states of India. Some of the states of the region do not have adequate number of SCs, PHCs and CHCs in the rural areas. The following table 3 is trying to show the present status of rural healthcare centres in the North-eastern states of India.

**Table 3: Shortfall of SCs, PHCs and CHCs as per estimation of mid-year population (as on 1st July 2019) in rural areas of North-East India**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| States | Estimated midyear population for Rural areas | SCs | | | PHCs | | | CHCs | | |
| R | P | S | R | P | S | R | P | S |
| Arunachal Pradesh | 1133000 | 338 | 385 | + | 51 | 143 | + | 12 | 63 | + |
| Assam | 29208000 | 6374 | 4643 | 1731 | 1040 | 946 | 94 | 260 | 177 | 83 |
| Manipur | 2132000 | 537 | 490 | 47 | 84 | 90 | + | 21 | 23 | + |
| Meghalaya | 2569000 | 822 | 477 | 345 | 124 | 118 | 6 | 31 | 28 | 3 |
| Mizoram | 547000 | 179 | 370 | + | 27 | 59 | + | 6 | 9 | + |
| Nagaland | 1281000 | 414 | 433 | + | 62 | 126 | + | 15 | 21 | + |
| Sikkim | 389000 | 96 | 176 | + | 15 | 29 | + | 3 | 2 | 1 |
| Tripura | 2595000 | 661 | 972 | + | 104 | 108 | + | 26 | 18 | 8 |
| All India/ Total | 874021000 | 189765 | 157411 | 43736 | 31074 | 24855 | 8764 | 7756 | 5335 | 2865 |

Notes: The requirement is calculated using the prescribed norms on the basis of rural population estimation for mid-year for the year 2019.

**R**: Required; **P**: In Position; **S**: Shortfall; **+:** Surplus

Source: Rural Health Statistics 2018-19, Govt. of India

Table 3 shows the SCs in rural areas of Assam, Manipur and Meghalaya still inadequate with the size of its population and shown a shortfall of rural SCs 1731, 47, 345 respectively. But the state Arunachal Pradesh, Mizoram, Nagaland, Sikkim and Tripura have surplus SCs. Similarly, Assam and Meghalaya has a shortfall of rural PHCs 94 and 6 respectively but the other states of NER have in better position with surplus values. In case of CHCs, the states Assam, Meghalaya Sikkim and Tripura is facing a problem of unavailability of sufficient community health centres. From this analysis it is noticeable that, the state Assam and Meghalaya have a shortfall of all three types healthcare infrastructure in the rural areas of those states. In case of Assam, an analysis has been given by (Buragohain, 2015) that, health status of the rural areas is poorer than the urban areas. In case of all India level, there is also a huge shortfall seen in the all three categories. It is implies that, the health infrastructure of the country still inappropriate.

**Status of manpower in rural healthcare services**

Healthcare infrastructure will not be sufficient if the adequate manpower is not available to provide the services. The states of North-East are in a good position for its female health workers/ ANMs in rural SCs accept Sikkim and Tripura. There is a shortfall of 24 and 388 of these two states. But the other states of the region are having surplus female workers in SCs of rural areas as per IPHS norms (RHS, 2018-19). In case of male health worker in rural SCs there is a huge deficiency (98063) shown all over the country including NER. Similarly, availability of doctors, health workers in PHCs is also very important. Because, the people of rural areas preferred the PHCs as their first choice if they facing general health related problems. The following Table 4 shows the present status of rural PHCs of NER in terms of their availability of doctors and other health workers as per IPHS norms.

**Table 4: Availability of Doctors and other health workers in rural PHCs of NER (As on 31st March, 2019)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| States | Shortfall of Doctors | Shortfall of health worker [female] / ANM | Shortfall of Health assistants [female] / LHV | Shortfall of Health assistant  [male] | Shortfall  of  Pharmacists | Shortfall  of  Laboratory Technicians | Shortfall of  Nursing Staff |
| Arunachal Pradesh | 27 | + | 126 | 62 | 88 | 93 | + |
| Assam | + | + | 694 | 946 | + | + | + |
| Manipur | + | + | 26 | 90 | + | 39 | + |
| Meghalaya | + | + | 11 | 21 | + | + | + |
| Mizoram | + | 33 | 40 | 37 | 11 | + | + |
| Nagaland | + | + | 126 | 126 | 32 | 52 | + |
| Sikkim | + | + | 12 | 16 | 16 | 0 | + |
| Tripura | + | 28 | 108 | 102 | + | 11 | + |

Note: calculated as per IPHS norms, **+**: Surplus

Source: Rural Health Statistics 2018-19, Govt. of India

As per IPHS norms there is a one doctor, one female health worker/ANM, one Health Assistant [Female] / LHV, one Health Assistant [Male], one pharmacist, one laboratory technician, one nursing stuff is necessary for each PHC. Table 4 shows, surplus doctors are available in rural PHCs of all the states of NER accept Arunachal Pradesh. Similarly, two states Mizoram and Tripura have insufficient female health worker/ANM in their rural PHCs but the other states of NER have surplus female health worker/ANM. In case of health assistant (Male and Female), there is a huge shortfall in every states of the region which means violation of IPHS norms. On the other hand the states Arunachal Pradesh, Mizoram, Nagaland and Sikkim facing a shortage of pharmacists in rural PHCs as per IPHS norms. Similarly, Arunachal Pradesh, Manipur, Nagaland and Tripura are facing the problem of insufficient laboratory technicians in rural PHCs. It is also mentionable that there are surplus nursing stuffs are available in all the states of NER, shown by (RHS 2018-19). It is a positive sign for rural healthcare service in the region.

The role of CHCs is very significant for rural people of the country. During a serious disease or other serious health related problems, people of the rural areas prefer the CHCs. The present situation of CHCs on the basis of availability of manpower in NER is shown in the following table 5.

**Table 5: Availability of Doctors and other health workers in rural CHCs of NER (As on 31st March, 2019**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **States** | **Manpower in CHCs of**  **NE States (As on 31st March, 2019)** | | | | | | |
| Shortfall of  AYUSH Doctors at CHCs | Shortfall of  Total Specialists [Surgeons, OB&GY, Physicians & Paediatrician] | Shortfall of  General Duty Medical Officers (GDMOs) - Allopathic | Shortfall of  Radiographers at CHCs | Shortfall of  Pharmacists at CHCs | Shortfall of  Laboratory Technicians at CHCs | Shortfall of  Nursing Staff at CHCs |
| Arunachal  Pradesh | 7 | 248 | 11 | 46 | 17 | 0 | + |
| Assam | 91 | 572 | + | 87 | + | + | 47 |
| Manipur | + | 89 | + | + | + | + | + |
| Meghalaya | 5 | 108 | + | 10 | + | + | + |
| Mizoram | 3 | 36 | 3 | 4 | 1 | + | 12 |
| Nagaland | 0 | 76 | 9 | 18 | + | + | + |
| Sikkim | 0 | 8 | 0 | + | 0 | + | + |
| Tripura | 2 | 70 | + | 7 | + | + | + |

Note: calculated as per IPHS norms, **+**: Surplus

Source: Rural Health Statistics 2018-19, Govt. of India

Table 5 shows only Manipur has the surplus AYUSH doctors, Nagaland and Sikkim has also adequate numbers. But the other states of the region have not adequate number of AYUSH doctors in their CHCs located in the rural areas. Similarly, in all the states of the region has a shortfall of total specialist doctors (Surgeons, OB & GY, Physicians and Pediatrician) in rural CHCs. On the other hand, Arunachal Pradesh, Mizoram and Nagaland have inadequate number of General Duty Medical Officers- Allopathic. In case of radiographers in rural CHCs, only Manipur and Sikkim has the surplus numbers. There is a shortfall of pharmacists shown in case of Arunachal Pradesh and Mizoram. In case of Laboratory technicians all the states of NER have adequate number of manpower and it is a positive sign for health sector of the region. But at the same time, Assam (47) and Mizoram (12) has a shortfall of nursing staffs of rural CHCs.

**Status of building positions of health sector in NER**

Basic infrastructure facilities are necessary to provide good health services among citizens. In the north-Eastern states the basic infrastructure facilities of rural health sector are not very well but comparatively better in some states than other states of the country. One of the basic infrastructures is building facilities. The current status of building facilities in rural health sector discussed below.

**Building position of SCs:** According to RHS 18-19, Arunachal Pradesh, Mizoram and Sikkim has the adequate number of government buildings. On the other hand there is a deficiency of government buildings in other the states of NER accept these three states. Assam has the highest deficiency of buildings and required around 594 buildings. This is resulted in Assam; a government package is required to construct new buildings in rural areas mainly for SCs. The following table 6 shows the current building position of SCs in NER.

**Table 6: Building position of SCs in rural areas of North-East India**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| States | Total Number of Sub Centers | Sub-Centres | | | Buildings Under Construction | Buildings required to be constructed |
| Govt. Builidings | Rented Buildings | Rent Free Panchayat / Vol. Society Buildings |
| Arunachal Pradesh | 385 | 385 | 0 | 0 | 0 | 0 |
| Assam | 4643 | 4049 | 466 | 128 | 0 | 594 |
| Manipur | 490 | 459 | 31 | 0 | 18 | 13 |
| Meghalaya | 477 | 468 | 2 | 7 | 0 | 9 |
| Mizoram | 370 | 370 | 0 | 0 | 0 | 0 |
| Nagaland | 433 | 316 | 1 | 116 | 59 | 58 |
| Sikkim | 176 | 175 | 1 | 0 | 1 | 0 |
| Tripura | 972 | 810 | 28 | 134 | 17 | 145 |

Notes: Required number of building to be constructed = Total functioning - (Government Buildings + Under construction) (ignoring States having excess.)

Source: Rural Health Statistics 2018-19, Govt. of India

**Building position of PHCs:** As per rural health statistics 2018-19, accept Nagaland all the states of north east India has the sufficient number of building in rural PHCs. There is a shortfall of building only in Nagaland and it was 7 only. Overall the north eastern states are in a better position in case of buildings of their PHCs.

**Building position of CHCs:** In all the North-Eastern states there is a sufficient number of PHC buildings are available, even there is an additional building is available in Tripura (RHS 2018-19). It implies that, basic infrastructure facilities in case of buildings all the states of NER are in a better position.

**Findings & Conclusion**

The study attempted to examine the current status of rural healthcare infrastructure of North-Eastern Region of India in terms of birth rate, death rate, natural growth rate and infant mortality rate. Though it is found that rural death rate of all the states of NER is lower than all India level, but in case of other indicators, it is not good. . It also discussed a serious health disease called AIDS and its current status on NE States through mortality rate and found this is a serious health issue for this region. Similarly, in case of healthcare infrastructure of NER, almost all the states of north east India are lacking better condition of SCs, PHCs as compared to the national average. Some of the states of this region do not have adequate number of SCs, PHCs and CHCs particularly in rural areas. It has also shortfall in terms of availability of doctors, nursing staffs etc. which needs to be increased with proper training. The study found that the improvement of health care infrastructure in NER of India is unequal and therefore it is unsatisfactory. There is an urgent need to take some policies by the government to establish some new SCs, PHCs in rural parts of north eastern region of India and also the existing infrastructure needs to be improved through increasing the number of health workers with proper train.

**Abbreviations:**

* ANM : Auxiliary Nurse Midwife
* AYUSH :Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy
* CHCs : Community health Centre
* GOI : Government of India
* ICMR :Indian Council of Medical Research
* IPHS : Indian Public Health Standards
* LHV : Lady Health Visitor
* NE : North- East
* NER : North-Eastern Region
* NRHM :National Rural Health Mission
* PHC : Primary Health Centre
* RHS : Rural Health Statistics
* SC : Sub Centre
* UNDP : United Nations Development Progamme
* WHO : World Health Organization

**References**

1. Buragohain P.P. Status of rural health infrastructure of Assam. *International Journal of Management and Social Science Research Review*, 2015, 1(15), 210-218.
2. Das S. Rural Health Status and Health Care in North-eastern India: A Case Study. *Journal of Health Management*, 2012, 14(3), 283–296.
3. GOI. Report of the National Commission on Macroeconomics and Health, Ministry of Health and Family Welfare, Government of India, 2005.
4. India HIV Estimates 2019 Report, National Aids Control Organization | ICMR – National Institute of Medical Statistics Ministry of Health & Family Welfare, Government of India.
5. Lyngdoh L M. Inter-State Variations in Rural Healthcare Infrastructure in North-East India. *The NEHU Journal*, 2015, 13 (2), 31-48.
6. Mal S, Bhattacharya P, Ghosh B. Consequence of health infrastructure of north east India in comparison with India. *Radix International Journal of Research in Social Science*, 2013, 2(7), 1-14.
7. National Family Health Survey (NFHS-4) India, 2015-16, Ministry of Health and Family Welfare, Government of India.
8. Paul P K, Jana S K, Maiti A. An Analysis of Health Status of the State of Assam, India. *Research Review International Journal of Multidisciplinary*, 2019, 4(9), 1179-1188.
9. Rutherford D. Dictionary of Economics. Second Edition. *Routledge*. London and New York, 2002.
10. Rural Health Statistics 2018-19, Government of India Ministry of Health and Family Welfare Statistics Division.
11. Saikia D. Health Care Infrastructure in the Rural Areas of North-East India: Current Status and Future Challenges. *Journal of Economic & Social Development*, 2014, 10 (1), 83-99.
12. Saikia, D. and Das, K.K. Rural Health Infrastructures in the North-East. <http://mpra.ub.uni-muenchen.de/41859/>, 2012. 1-10.
13. SRS Bulletin, Sample Registration System, Office Of The Registrar General, India Vital Statistics Division, West Block 1, Wing 1, 2nd Floor, R. K. Puram, New Delhi-110 066, Volume 52 No.1, May, 2019.
14. The World Health Report .2000. Health Systems: Improving Performance, World Health Organization.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*