Assessment of public health systems focusing on infrastructure & human resources for health, at rural facility level in Arunachal Pradesh, India

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Abstract
Introduction: This paper is an attempt to get an in depth knowledge of the public health status of the state and the challenges being faced by the state. Adequate public health Infrastructure and Human Resources are the two main components that helps in ensuring proper delivery of health services to the society. This paper will focus mainly on these two components at the community level i.e at Sub centre (SC), Primary Health Centres (PHCs) and Community Health Centres (CHCs). This is an effort to enable and help medical practitioners, healthcare providers and other stakeholders to identify the need and to ensure optimum utilization of available resources to improve health status of the community and the state.

Materials and Methods: Desk Review of the available literature and analysis of the secondary data available in public domain was carried out. In terms of presence of SC, PHC & CHC there are enough number of facilities present in the state but the condition has been appalling in terms of quality of health care services & availability of specialist and well trained manpower. To get an idea of the current health status of the state data related to health indicators was collected from the RHS, NFHS 4, Health & family welfare department of Arunachal Pradesh, MIS etc. HR and infrastructure data was taken from RHS.

Results: In spite of showing progress in various health indicators like IMR, Institutional deliveries, ANC etc. there is lot yet to be achieved. Due to identified bottlenecks in the paper the healthcare delivery system of state is not of high quality which takes a toll on performance of the state. A roadmap needs to be developed and adhered to in order to achieve the desirable and sustainable health system with adequate HRH and quality infrastructure in the state.

Keywords: Health systems, Health Infrastructure, Human resources for health, North east public health, Rural healthcare, Community health accessibility.

Key Message: A roadmap for Arunachal’s health System needs to be developed and adhered to in order to achieve the desirable and sustainable health system with adequate HRH and quality infrastructure in the state.

Introduction
Arunachal Pradesh, “The land of rising sun” is situated as a sentinel in the North-Eastern part of India, bounded by international boundaries with China in the north, Myanmar in the southeast and Bhutan in the west. The state is situated at latitude of 90.36°E to 97.3°E and longitude of 26.42°N to 29.30°N covering a total land area of 83,743 sq. km. The population of the state is 13,82,611.¹ Density of population is 17 persons per sq. km. Sex ratio of the state is 958 females per 1000 males as per NFHS 4.² Due to its peculiar topography and difficult terrain, there is widely dispersed settlement pattern of the population, rural contributing 77.33% and urban contributing 22.67%. The percentage decadal growth is 26.92%. The total literacy rate of the state is 66.95%.¹

The difficult and hilly geographical terrain of Arunachal is similar to the other North Eastern states with adverse road conditions, scattered population with low density and poor connectivity with mainland India. North East states are facing rising demand for healthcare, limited resources and increasing inequalities in health care delivery and Arunachal is no exception to this. This paper is an attempt to get an in depth knowledge of the public health status of the state and the challenges being faced by the state. Adequate public health Infrastructure and Human Resources are the two main components that helps in ensuring proper delivery of health services to the society. This paper attempts to focus mainly on these two components at the community level (Rural) i.e at Sub centre (SC), Primary Health Centres (PHCs) and Community Health Centres (CHCs). The findings will enable and assist medical practitioners, healthcare providers and other stakeholders to identify the need and to ensure optimum utilization of available resources to improve health status of the community and the state.

Materials and Methods
Analysis of the secondary data available in public domain was carried out. To get an idea of the current health status of the state data related to health indicators was collected from the RHS, NFHS 4, NFHS 3, Health & family welfare department of Arunachal Pradesh, MIS etc. HR and infrastructure data was taken from RHS.

Results
Maternal and Child Health
The Infant Mortality Ratio of Arunachal Pradesh is 23 deaths per thousand live births, according to NFHS-4 (2015-16) with under 5 mortality of 33 per 1000 live births. Full immunization coverage is only 38.2% which is much lesser as compared to the national average of 62%. There are only 26.8% of women getting full ante natal care with 52.3% of institutional deliveries.

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Fig. 1: The graph showing the state of MCH indicators in the past 10 years for Arunachal Pradesh & India. Source: (NFHS III, 2005-06)\(^1\) (NFHS IV, 2015-16)\(^2\)

Nutritional Status
There are 29.4% of stunted children in Arunachal Pradesh, 17.3% are wasted while 19.5% are underweight. There are 8.5% of women and 8.3% of men (age 15-49 years) whose BMI is below normal while 18.8% women and 20.6% of men are overweight. 40.3% of women (age 15-49 years) are anaemic while for children (age 6-59 months) the figure is 50.7%.\(^2\)

Fig 2: Trends in Nutritional Status of children – India & Arunachal Pradesh. Source: (NFHS III, 2005-06)\(^3\) (NFHS IV, 2015-16)\(^2\)

Although there is a decrease in percentage of people whose BMI is below normal, the situation is getting worse for obesity, the percentage has increased in both men and women, as shown in the graph below.

Fig 3: Trends in Nutritional Status of Adults – India & Arunachal Pradesh. Source: NFHS 4 (2015-16) & NFHS 3 (2005-06)

Risk Indicators related to NCDs
Other than increasing number of overweight people in Arunachal Pradesh as discussed above the status of some other indicators related to NCDs is as follows in the population aged 15-49 years. The data for NCD indicators like Blood Sugar, Hypertension, tobacco consumption etc. was not available during the year 2005-06 i.e for NFHS 3 so, we are unable to look at the trends for this.

Fig 4: NCD Indicators of Men & Women in Arunachal Pradesh. Source: NFHS 4 (2015-16)

Infrastructure and Human Resources
Physical Infrastructure
There are 9 District Hospitals in the state working as FRUs out of 14 District/General Hospitals. The Mobile Medical Unit Scheme is under being implemented in the state.\(^4\)

The following table shows public health infrastructure in its 16 districts:

| Type of the Facilities | No. of Required Facilities* | No. of In Position Facilities** | Shortfall |
|------------------------|----------------------------|-------------------------------|-----------|
| SCs                    | 318                        | 312                           | 6         |
| PHCs                   | 48                         | 143                           | In surplus|
| CHCs                   | 12                         | 63                            | In Surplus|

Source: (*Taken from RHS 2016-17\(^5\) where the requirement was calculated using the prescribed norms on the basis of rural population from census 2011. ** As per RHS 2017-18\(^6\))

At Sub Centre level
There are 192 SC out of 312 with ANM quarter and 182 ANMs are living in those quarters. There are 42.9% of SC which don’t have regular water supply, 46.2% don’t have electricity and 37.8% are not approachable with all-weather motorable road. There are 223 SC that don’t have separate toilets for male and female patients while 133 don’t even have toilet facility for the staff.\(^6\)

At PHC Level
64 PHCs out of 143 are functioning on 24*7 basis, 72 has labour room, 22 has OT and 54 PHCs have at least four beds. 10.5% of PHCs don’t have electric supply, 16.8% are without regular water supply whereas 18.2% PHCs are not accessible through all-weather motorable approach road. Telephone and computer are present in only 4.9% and 9.1% PHCs respectively. Only 56 PHCs have referral transport. 50 PHCs don’t have any toilet facility for the staff while 93 PHCs are without separate toilets for male and female patients.\(^6\)
At CHC Level
There are only 2 CHCs out of 63 that have all four specialists, 50 CHCs have functional laboratory, 34 with functional OT, 59 have functional labour room while 48 have New Born Care Corner and only 13 are having at least 30 beds as per the norms. There are only 5 CHCs which have quarters for specialist doctors while only 3 of them are occupied. 56 CHCs have referral transport available. There are 9 CHCs that does not have toilet facility for the staff while 30 don’t have separate toilet for male and female patients.⁶

Health Care workforce in the state
Arunachal Pradesh is still maintaining its health workforce data in paper based system with some excel spread sheets.⁷ The state doesn’t have any clear cut HR Policies for the workforce and there are no set retention strategies⁸. The healthcare workforce availability in the state is as follows:

At Sub Centre level

As shown in Fig. 5 there is requirement of 312 ANMs and Male Health Workers at Sub Centre Level, 323 ANMs are available while there are only 92 male health workers in position which is indicating a shortfall of 220 Male health workers in the state. On the other hand, out of 312 SCs, 278 are functioning without any Female Health Worker (ANM), 166 are functioning without any male worker and 61 sub centres don’t have male as well as female health worker.⁹

At PHC Level

Fig. 6 above shows that there is a shortfall of 137 female health assistants, 62 male health assistants and 21 doctors at the PHC level while there are only 3 PHCs functioning with 4 doctors, 18 PHCs in the state has only 1 doctor whereas there are 40 PHCs which don’t have any doctor. There are only 36 PHCs in the state which has a lady doctor and 55 PHCs have lab technicians and 55 have pharmacologist. There are only 30 PHCs which have AYUSH facility available in Arunachal Pradesh.⁶

At CHC Level

Fig. 7: HR Status at CHC level (as on March 2018); Source – RHS 2018

The condition of HR availability is worst at the CHC level. As shown in figure no. 7 above, there is a huge gap in the required and in position doctors at the CHC level. At PHC and CHC level, 206 Pharmacists are required while only 89 are available, 123 Lab Technicians are available against the required 206 positions and Nursing staff also is inadequate with 498 in position against 584 required.⁶

Discussion
Although Arunachal Pradesh is showing a steady improvement in its health indicators from NFHS 2005-06 to NFHS 2015-16, it can be seen that the state is lacking behind in areas like Institutional deliveries, Ante Natal Check-up and in providing full Immunization to the children as compared to India and other North Eastern states as shown in the fig. 8 below. However, from being second highest state for high IMR with 61 deaths per thousand live births in 2005-06 amongst the North East States, Arunachal Pradesh is now at second lowest with IMR of 23 deaths per thousand live births in 2015-16. The best performing state in the North East region in case of IMR is Manipur with 22 infant deaths per thousand live births. The state has also shown tremendous improvement in Institutional deliveries from 28.5% in 2005-06 to 52.3% in 2015-16, though Arunachal Pradesh has a long way to reach close to Sikkim which is having 94.7% institutional deliveries.
From the above data there is an evident decrease in the number of stunted and underweight children but the condition is worsening and worrying with regards to overweight or obesity in the state as is the case with other North Eastern States also. The state needs to be vigilant and can start focussing on this changing nutritional scenario of its population in order to safeguard the community from the emerging non communicable diseases at an alarming rate. With 59% of men and 26.3% of women consuming alcohol, Arunachal Pradesh is the highest alcohol consuming state in the North East Region while for tobacco use also, the state is amongst the highest tobacco consuming states. As Alcohol, tobacco consumption, high obesity rate etc. are the risk factors for many NCDs like Cardio vascular diseases, Cancers etc, it is not exaggeration to say that the non-communicable diseases might emerge as a public health concern for the state and the entire North East Region. In the age group of 40-69 years, cardio vascular diseases are the 2nd most common/leading cause of deaths in Arunachal Pradesh in 2016. The state has to be well prepared and proactive in order to prevent this. To deal with the present and upcoming health concerns the state has to attend to improving the condition of health infrastructure and Human Resources.

With regards to infrastructure, as per the IPHS norms, the facilities available at community level i.e. CHCs, PHCs are in surplus while there is shortage of only 6 Sub centres in the state but majority of these facilities are not connected through proper all-weather approachable & motorable roads. The facilities lack basic amenities like electricity, 24*7 water supply, computer & telephonic connectivity. There is lack of basic and mandatory facilities like separate toilets for male and female toilets, toilets for staff, residential quarters for staff etc. The quality of existing infrastructure needs to be looked into, as mere presence of buildings without proper amenities is not going to serve the purpose. These factors also affects the willingness of the existing Human Resources to work effectively and efficiently.

Saikia et.al in their paper on status of rural infrastructure in the North East India also found that after the implementation of NRHM there has been significant improvement in the rural health infrastructure in North East but the condition of the region has been atrocious in terms of other components of health infrastructure, especially in terms of quality of health care services & availability of specialist and well trained manpower.

According to WHO, availability & accessibility of human resources is the prerequisite for efficient functioning of health systems because their performance will affect the quality of the health services, their effectiveness, efficiency, accessibility & viability. The results of the secondary data analysis show that there is huge gap in the Human Resources for Health in Arunachal Pradesh. In spite of having ANMs in surplus there are 89% of sub centres which are functioning without any ANM or female health worker.

Since the scope of the study is limited to secondary data analysis and desk review only, it is challenging to find out the reasons but from the data and literature few of the probabilities can be anticipated like inappropriate distribution of the existing resources, apprehension of the ANMs to serve in far flung and rural areas due to unavailability of basic amenities at the facilities etc. Same is the case with PHCs with regards to the ANMs, there is a huge gap in the availability of ANMs at PHC level while doctors and male health workers are also in shortage. There is a need for proper distribution of existing human resources at SC and PHC level. It would be helpful if the state invests in evaluating its HRH policies and reshape them if necessary. Appropriate HRH policies help in dealing with chronic imbalances with multifaceted approach on the health workforce: quantitative mismatch, qualitative disparity, unequal distribution etc.

At CHC level there is huge and alarming unavailability of HRH especially the specialist doctors, surgeons, paediatricians, obs & gynae etc. An increased focus on production, employment and retention policies and strategies for the Human Resources for Health could help the state. It is also found that none of the facilities in Arunachal Pradesh are functioning as per IPHS norms.

**Conclusion**

Although the North East Region along with Arunachal Pradesh is showing progress in the health indicators, there are so many challenges that needs to be addressed to ensure smooth delivery of healthcare services to the community. Apart from hilly and difficult terrain, unavailability of proper roads & connectivity to the existing healthcare facilities, telephone and internet unavailability there are problems like severe HRH shortage, inappropriate distribution of human resources, lack of basic amenities in the existing health facilities which might also be contributing to apprehension of Human resources to work in the far flung facilities with adverse conditions. Due to these bottlenecks the healthcare delivery system of Arunachal Pradesh is not of high quality which takes a toll on the performance of the state in achieving the basic health indicators. A roadmap needs to be developed and adhered to in order to achieve the desirable and sustainable health system with adequate HRH and quality infrastructure in the state. The existing facilities must be adequately staffed with well-trained human resources and the state needs to develop strategies and policies to recruit and retain these resources.
Conflict of Interest: None.

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