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Health Inequality in North East India: evidence from national family health survey- 5 (2019-21)

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Abstract

Equal accessibility of health care services is one of the main objectives of health policy of the government. As the third goal of the Sustainable Development Goals 2030 is "Good Health and Economic Well being", health *inequality* causes serious concerns for the policy makers. An attempt has been made in this research paper to compare the health inequalities of the North Eastern States of India with the national average in some selected health parameters on the basis of the latest National Family Health Survey (NFHS)-5 (2019-21) data. A composite index is constructed and the states are grouped into three categories: Aspirants, Achievers, and Front-runners. It is revealed from the study that the health status of the states of North East India is below the country average in some selected health output parameters like antenatal care visit, vaccination, infant mortality etc. Moreover, there exists vast inequality among the states of North Eastern Region (NER) regarding health output parameters. However, the states of NER performed well in some health input parameters like women literacy, sanitation, drinking water facilities etc. It is also apparent from the assessment of performance ranking among the NER states that Assam, Meghalaya and Tripura are the states lagging behind and Sikkim and Mizoram performed well in health indicators as per the latest available NFHS-5 (2019-21) Report. As providing equal accessibility of health care services is a serious concern for the policy-makers, such information will help balanced development of all the North Eastern states of India.

Keywords: Health care, parameters, composite index, inequality, balanced development

1. Introduction

Reduction of inequality is regarded as one of the important parameters for economic welfare of a country as inequality raises questions for sustainable development of any country. One of the

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main inequalities is the health inequality and health inequality causes serious concern for the policy makers. Therefore, the United Nations has declared the third goal of the Sustainable Development Goals 2030 as "Good Health and Economic Well being". In developing countries where resources are limited (where only 3 to 6 per cent of GDP is spent on health), equal accessibility to health care services for all people is very important for economic well being of a country.

The COVID-19 pandemic is a reminder to all about the urgent need of making healthcare equitable in a country like India. According to the National Health Profile (NHP), there is only one government employed allopathic doctor for every 10,189 people and one state run hospital for every 90,343 people in India.

Since independence, there have been some remarkable successes and achievements in India's overall health care and health-care delivery system. However, the progress is uneven across regions, income, caste and gender. According to the Oxfam India Report (2021), the rich, on an average, live seven and a half years more than the poor. Similarly, on an average, a woman from the general category lives 15 years longer than a Dalit woman. Health equity is important in India because the existing health care infrastructure has always been centered on those who can pay (Rai, 2022).

North East India comprises of seven sisters namely Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and a sister state Sikkim. All the North Eastern states are economically underdeveloped and regional disparities is widening and worsening for health workforce (Hossain, 2019). It is found from the studies that the geographic condition and inaccessible terrain of North East India seems to be a constraint, among others, in providing health infrastructure in the region (Hossain, 2019).

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Generally, health care services encompass all the personal and community health services including medical care and related education and research directed towards protection and promotion of health of the community (Sarma, 2004). In a country like India with large social inequalities combined with rapid economic growth, research on health inequalities has a special significance for policy making. Improving efficiency of health systems becomes more important to address health service delivery challenges in a developing country (Sun et al., 2017).

For this Government needs prior assessment of the magnitude and varied dimensions of the health problems for reduction of inequalities in accessing the healthcare facilities. Health inequality can be examined by studying variation in health status, health services facility use, expenditure on ailments treatment and sources of financing health care services using selected variables that determine health outcomes in relation to its health inputs (Dilip, 2005).

Therefore, this study attempts to examine the present health status of the states of North East India compared with that of all India average on the basis of the recently published NFHS-5 (2019-21) report.

2. Literatures Review

A few studies have been found about the health status of states of North Eastern Region (NER) on the basis of some field survey, government and semi-government Reports. Ghatak & Lalitha (2015) in their study attempted to examine if the patterns of morbidity, utilisation of public and private health care facilities and economic burden of illness reflect the geographic contiguity in North-Eastern states. The paper also analysed the determinants of income loss due to ailment in NER and other parts of the country. Bharati (2017) tried to examine the association of economic inequality with health inequality for women in North East India. The main finding of this study is that there is a large disparity between the occurrence of poor and non-poor conditions as well

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as under-nutrition in different states of North East India. The basic deviation from non-poor and poor women are higher education, service holding, safe drinking and toilet facility and all have a positive impact on under-nutrition.

Hossain (2019) investigated the basic parameters of health, namely health profile, health infrastructure, health expenditure and health care utilization in North East India and provided an analysis of regional disparities in health care sector. The research work carried out by Swargiary & Lhungdim (2021) focused on the disease burden and the pattern of utilization of healthcare facilities in NER of India despite the challenging terrain and ongoing development. According to the researchers, government attention on the needs as per the region is highly recommended to reduce untreated morbidities, health inequalities as well as to better the public health utilization.

Recently, Meitei, et al., 2022, in a reputed journal, predicted anaemia among children in North-East India by applying Machine Learning (ML) algorithms to latest available National Family Health Survey (NFHS)-4 data. They identified many harmful effects of anaemia, which include psychomotor retardation, which in turn decreases the learning ability and causes low intelligence among pre-school children. A systematic assessment of algorithms is performed in terms of accuracy, sensitivity, and specificity and it is found that factors like mother's anaemic status, age of the child, social status, mother's age, mother's education, religion are important in identifying the child as anaemic. There are a few studies by Meitei & Singh (2022), Suri et al. (2022), Mukherjee & Parashar (2022) etc. as well on different issues of health status of North Eastern States utilizing different reports of NFHS.

However, the inter-state level analysis on the basis of the recently published NFHS-5 (2019-21) data is a less touched topic among the researchers so far in the North Eastern States is concerned. The present study expects to fill up this research gap.

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3. Objectives of the Study

The specific objectives of the study is

i) To examine the health inequality in selected health output and health input parameters in North Eastern States of India and

ii) To assess the performance rank of the states of NER under the three categories: Aspirants, Achievers, and Front-runners.

4. Data Source and Methodology

The study is entirely based on secondary data. The data are collected mainly from the National Family Health Survey (NFHS)-5 (2019-20) report (IIPS, 2021). Various literatures have defined health inputs as water supply, sanitation, hospital bed facility etc. (IGIDR, 2005, Van Bulck et al., 2020). Similarly, Infant mortality, institutional birth, antenatal care, total fertility, underweight children etc. are normally considered as the indicators of health attainment level (IGIDR, 2005; Das, 2017). The health inequalities of the states of NER are assessed on the basis of the NFHS-5 report under two grouping of the parameters: health outputs and health inputs: (a) maternal and child health, named as health outputs and (b) women literacy and household profile, named as health inputs.

The health indicators for maternal and child health, named as health outputs are taken as

(i) Mothers who had at least 4 antenatal care visits (ANC) (%),

(ii) Institutional births (INB) (%),

(iii) Children age between 12-23 months fully vaccinated based on information from either vaccination card or mother's recall (VAC) (%),

(iv) Total Fertility rate (TFR) (%),

(v) Infant Mortality Rate (IMR) (%),

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(vi) Children under 5 years of age who are underweight (weight-for-age) (WEG) (%),

(vii) Children age between 6-59 months who are anaemic (<11.0 g/dl) (C_ANM) (%) and

(viii) All women age group between 15-49 years who are anaemic (W_ANM) (%).

Moreover, women literacy and household profile indicators, named as health inputs are taken as

(i) Women who are literate (LTR) (%),

(ii) Population living in households with electricity (ELC) (%),

(iii) Population living in households with an improved drinking-water source (DRW) (%),

(iv) Population living in households that use an improved sanitation facility (SAN) (%) and

(v) Households using clean fuel for cooking (COK) (%).

Out of the above health output parameters, three are positive parameters namely percentage of mothers receiving antenatal check-up (ANC), percentage of births delivered in a health facility (institutional birth) (INB), & percentage of children who are vaccinated (age 12-23 months) (VAC) and rest are negative parameters namely TFR, IMR, WEG, C_ANM and W_ANM. This implies that higher is the value, better is the performance for positive parameters while lower is the value better is the performance for negative ones. Again, all the selected health input parameters are the positive parameters, i.e. higher is the value better is the performance of the parameters.

Then, a composite Health Index is constructed in line with the methodology followed to analyses the overall performance and incremental improvement in the states and the union territories by National Institution for Transforming India (NITI) Aayog in collaboration with

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Ministry of Health & Family Welfare and World Bank [National Institution for Transforming India (NITI) Aayog (2019, June)].

In this study, each indicator value is scaled, based on the nature of the indicator. For positive indicators (e.g. institutional birth, vaccination etc.), higher value implies better performance and thus with data value as X_i , the scaled value (S_i) for the ith indicator is calculated as follows:

*Scaled value (S_i) for positive indicator = (X_i – Minimum Value)*100/(Maximum Value-Minimum Value)*

Similarly, for negative indicators (e.g. under-weight children, anemic children etc.) where lower value implies better performance, the scaled value is calculated as follows:

*Scaled value (S_i) for negative indicator = (Maximum Value –X_i)*100/(Maximum Value-Minimum Value)*

The minimum and maximum values of each indicator are determined based on the values for that indicator across states for that particular year i.e. 2019-21.

The scaled value for each indicator lies between the range of 0 to 100. Thus, for a positive indicator such as institutional deliveries, the district with the lowest institutional deliveries will get a scaled value of 0, while the district with the highest institutional deliveries will get a scaled value of 100. Similarly, for a negative indicator such as under-weight children, the states with the highest under-weight children will get a scaled value of 0, while the district with the lowest under-weight children will get a scaled value of 100. Accordingly, the scaled value for other districts will lie between 0 and 100 in both cases. Based on the above scaled values (S_i), a composite index score was then calculated as

Composite Index $=\sum(W_i S_i)/\sum W_i$ where Wi is the weight for ith indicator.

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The Composite Index score provides the overall performance and domain-wise performance of each state and has been used for generating overall performance ranks. Based on the value of the composite Health Index, the states are grouped into three categories: Aspirants, Achievers, and Front-runners.

5. Result and Discussion

5.1 Health Inequality in selected Health Output and Health Input Parameters in NER

From Table 1 it is revealed that the status of all NER is below the country's average in selected health output indicators like ANC, INB and VAC and there exists vast inequality among the states of NER regarding health outputs. The average values of all the NER states in case of these selected health outputs are below the country average which is a serious concern for the policy makers. However, the overall status of NER is above average in case of other health outputs like TFR, IMR, WEG, C_ANM and W_ANM.

From Table 1 it is also revealed that mean value of ANC is below the country average with a high standard deviation. Manipur is the only state in NER where the ANC is above the country average. Even Sikkim shows only a marginally high value than the all India average.

In case of INB the condition of Nagaland is very deplorable and only two states of NER (Sikkim and Tripura) show the value above the country average. Vaccination (VAC) status is above the country average only in Sikkim among the states of NER.

Table1: Health Inequality in the States of NER in comparison with all India Average in selected Health Outputs (%)

States	ANC	INB	VAC	TFR	IMR	WEG	C_ANM	W_ANM
Arunachal Pradesh	36.5	79.2	76.4	1.8	12.9	15.4	56.6	40.3
Assam	50.7	84.1	71.8	1.9	31.9	32.8	68.4	65.9

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Manipur	79.4	79.9	75.7	2.2	25	13.3	42.8	29.4
Meghalaya	52.2	58.1	80	2.9	32.3	26.6	45.1	53.8
Mizoram	58	85.8	83.7	1.9	21.3	12.7	46.4	34.8
Nagaland	20.7	45.7	71.3	1.7	23.4	26.9	42.7	28.9
Sikkim	58.4	94.7	87.6	1.1	11.2	13.1	56.4	42.1
Tripura	52.7	89.2	77.1	1.7	37.6	25.6	64.3	67.2
India	58.1	88.6	83.3	2	35.2	32.1	67.1	57
Mean	**51.08**	**77.09**	**77.95**	**1.9**	**24.45**	**20.8**	**52.84**	**45.3**
SD	**17.08**	**16.65**	**5.61**	**0.51**	**9.34**	**8.00**	**10.04**	**15.32**

Source: Adapted and Calculated from NFHS-5 (2019-21) Report

On the other hand, except Meghalaya, all the other NER states show the TFR value below the country average which is a good sign for the NER economy. Again except Tripura, all the other NER states show a lower IMR value in comparison with national average. Assam has improved its position in IMR remarkably in this latest report of NFHS-5. In case of WEG, all the NER states, except Assam, show better result. Similarly, in case of the anaemic children (C_ANM), the status of NER is above the national average (except Assam) and, in case of the anaemic mother (W_ANM) the status of NER is above the country average (except Assam and Tripura).

It is evident from Table 2 that the status of NER states is comparatively better in selected health inputs than in selected health outputs. Women Literacy rates (LTR) of all the NER states except Arunachal Pradesh are above the national average. Similarly, except Manipur and Assam, other NER states show better sanitary facilities than the national average. Again, except Arunachal, Assam and Meghalaya, all other five NER states electrification status (ELC) is also better than the country's average. However, in case of cooking gas facility, almost all the NER states except Sikkim, Mizoram and Manipur, show below average performance during the study period.

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Table 2: Health Inequality in the States of NER in comparison with all India Average in selected Health Inputs (%)

States	LTR	DRW	ELC	SAN	COK
Arunachal Pradesh	71.3	93.7	94.8	82.9	53.2
Assam	75.1	86	92.6	68.6	42.1
Manipur	85.3	77.1	98.1	64.9	70.4
Meghalaya	87.6	79.2	91.9	82.9	33.7
Mizoram	94	95.8	98.2	95.3	83.8
Nagaland	83.4	91	98.6	87.7	43
Sikkim	87.1	92.8	99.3	87.3	78.4
Tripura	78.3	88	98.2	73.6	45.3
India	71.5	95.9	96.8	70.2	58.6
Mean	**82.76**	**87.95**	**96.46**	**80.40**	**56.24**
SD	**7.42**	**6.82**	**2.92**	**10.43**	**18.76**

Source: Adapted and Calculated from NFHS-5 (2019-21) Report

5.2 Assessment of the Performance Rank of the states of NER

Table 3 revealed the fact that out of the eight NER states Sikkim, Mizoram and Manipur and Arunachal Pradesh are the Front-runners; Nagaland and Meghalaya, Tripura and Assam are the Aspirants states in selected health outcomes in NER. No states of NER have come out to be Achievers according to the estimation done on the basis of the latest NFHS-5 (2019-21) Report.

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Table 3: Performance ranking of the states of NER for Health Outputs

Sl. Nos.	Front-runners	Achievers	Aspirants
1	Sikkim (81.75)	NIL	Nagaland (42.40)
2	Mizoram (73.81)	NIL	Meghalaya (37.44)
3	Manipur (70.15)	NIL	Tripura (36.04)
3	Arunachal Pradesh (58.66)	NIL	Assam (25.83)

Notes: 1. Figures in parentheses show the values of the composite index
2. Performance rankings were done on the basis of the value of the composite index constructed for health outputs (ANC, INB, VAC, WEG, C_ANM and M_ANM)
3. The states are categorized on the basis of the calculated composite index values constructed on the basis of data of NFHS-5 (2019-21) score range: Front-runners: top one-third (Index score >55.46), Achievers: middle one-third (Index score between 47.95 and 55.46), Aspirants: lowest one-third (Index score <47.95) in line with NITI Aayog (2021) report.

Source: Adapted and Calculated from NFHS-5 (2019-21) Report.

Composite indices are calculated from NFHS-5 (2019-21) Report.

On the other hand, it is evident from Table 4 that only Mizoram, Sikkim are the front-runners among the states of North Eastern Region. Nagaland is the only Achiever state while the rest of the states such as Arunachal Pradesh, Manipur and Tripura, Meghalaya and Assam are the Aspirants states in NER in case of health input parameters.

Table 4: Performance ranking of the states of NER for Health Inputs

Sl.Nos.	Front-runners	Achievers	Aspirants
1	Mizoram (97.03)	Nagaland (59.07)	Arunachal Pradesh (42.76)
2	Sikkim (82.86)		Manipur (42.66)
			Tripura (42.11)
			Meghalaya (24.42)
			Assam (17.19)

Notes: 1. Figures in parentheses show the values of the composite index.
2. Performance rankings were done on the basis of the value of the composite index constructed for health inputs (LTR, ELC, DRW, SAN and COK).

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3. The States are categorized on the basis of the calculated composite index values constructed on the basis of data of NFHS-5 (2019-21) score range: Front-runners: top one-third (Index score >61.59), Achievers: middle one-third (Index score between 53.60 and 61.59), Aspirants: lowest one-third (Index score <53.60) in line with NITI Aayog (2021) report.

Source: Adapted and Calculated from NFHS-5 (2019-21) Report.

Composite indices are calculated from NFHS-5 (2019-21) Report.

From Table 3 and Table 4 it is evident that Assam, Meghalaya and Tripura are the states lagging behind in health parameters among the states of the NER. Sikkim and Mizoram performed well in health indicators as per the latest available NFHS-5 (2019-21) Report.

6. Conclusion

From the above analysis, it is evident that there exists vast inequality among the North eastern states regarding health outputs parameters like antenatal check-up, institutional birth, vaccinated children, infant mortality rates, underweight children, anaemic children and mother etc.. High level of disparity is also reflected in high value of standard deviation in selected health output parameters. Moreover, when the status of NER states are compared with the country average, it is found that the average values of all the NER states in case of these selected health outputs are below the country average which is a serious concern for the policy makers. However, the status of NER states is comparatively better in selected health inputs than in selected health outputs parameters. The performance of NER states is better than the country average in selected health input parameters like women literacy rates, drinking water facility, sanitary facility and electrification etc. except in cooking gas facility.

The assessment of performance ranking among the NER states reveals the fact that Assam, Meghalaya and Tripura are the states lagging behind in health parameters among the states of the NER. Sikkim and Mizoram performed well in health indicators as per the latest

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available NFHS-5 (2019-21) Report. Although Manipur performed relatively well in health outputs, the state may not be able to sustain its position due to the current unstable political situation. Since the performance of the states of NER is better in selected health inputs, therefore, this may be reflected in attainment of health outputs in future which may show a hope for the policy makers in the region.

Government needs prior assessment of the magnitude and varied dimensions of the present status of health problems of the states for reduction of inequalities in accessing the healthcare facilities in North East India. The study identifies front-runner, achiever and aspirant states of NER. Such information of inequalities in health sector in the region may help the policy makers for future planning and to use scare resources of the country in a better way for balanced development of all the states of North East India.

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