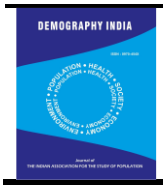

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Distributional Equity and Socioeconomic Inequalities in Public Healthcare Utilisation in Assam, India

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Abstract

Health equity remains a critical concern in India's policy discourse, particularly in underserved regions like Assam, where disparities in access and benefit from public health services persist across socioeconomic and geographic lines. This study investigates the distributional equity of public healthcare utilization and government health spending in Assam using data from the 75th Round of the National Sample Survey (2017–18) and National Health Accounts. Employing the Benefit Incidence Analysis framework, alongside concentration indices and curves, the research quantifies how public subsidies are distributed across income quintiles and rural–urban divides.

Findings reveal that while public health systems in rural Assam show a pro-poor orientation particularly for inpatient care, urban areas exhibit a regressive trend where wealthier groups disproportionately benefit from public health subsidies. Out-of-pocket expenditure remains high, especially among lower-income households, raising concerns about financial protection. Disease burden also varies: rural populations report higher infectious morbidity, whereas urban residents face a rising prevalence of non-communicable conditions.

Patterns of healthcare utilization further underscore inequality: poorer and less-educated groups are more reliant on public services, while wealthier and more educated individuals prefer private care. The study highlights systemic challenges including poor quality of services, limited availability, and infrastructural bottlenecks that deter effective public service utilization.

The evidence calls for context-specific policy reforms aimed at expanding public healthcare infrastructure, enhancing service quality, and improving targeting mechanisms to ensure equitable access and benefit realization, particularly among marginalized populations in both rural and urban Assam.

Keywords

Health Equity, Healthcare Utilization, Northeast India, Public Health Expenditure, Socioeconomic Inequality

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Introduction

Health equity is a cornerstone of sustainable development and social justice. It refers to the fair distribution of health services, regardless of income, geography, caste, or gender, ensuring that individuals receive care based on need and not on their ability to pay (World Health Organization [WHO], 2010). In India, where socioeconomic and regional disparities are deeply rooted, achieving equity in healthcare access remains a major challenge despite ongoing reforms and public investments. The problem becomes more pronounced in India's peripheral regions like the North Eastern Region (NER), which often lags behind the national average in terms of healthcare infrastructure, accessibility, and outcomes (Bhan, 2020).

The North Eastern Region consists of eight states Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, and Sikkim sharing international borders and inhabited by diverse ethnic communities. Due to its geographical isolation, infrastructural limitations, and complex socio-political landscape, the region has historically been underrepresented in national health planning (Baru et al., 2010; Ministry of Development of North Eastern Region [MDoNER], 2021). Among these states, Assam stands out not only as the most populous but also as the administrative and economic hub of the Northeast. It provides a critical context for studying public health disparities and the effectiveness of health policy interventions.

Assam, with a population exceeding 31 million (Census 2011), contributes significantly to the health indicators of the NER. However, its health outcomes continue to underperform when compared to national standards. For example, the state records higher infant and maternal mortality rates, along with a high prevalence of communicable diseases (NITI Aayog, 2020). According to the *National Health Accounts Estimates* (MoHFW, 2021), Assam accounted for only 3.3% of India's total public health spending in 2017–18, despite its disproportionately high disease burden. This reflects a serious gap between health needs and public investment.

Furthermore, the state's health financing profile is heavily skewed towards out-of-pocket expenditure (OOPE), which stands at 61% of total health expenditure much above the 50% national average (MoHFW, 2021). High OOPE is a major contributor to catastrophic health spending, especially among low-income households, pushing many into poverty (Xu et al., 2003; WHO, 2010). In Assam, the effects of high OOPE are compounded by low levels of public awareness, uneven health infrastructure, and socio-cultural barriers, which restrict access to even the existing government health services (Baru et al., 2010; Reddy et al., 2011).

Several national schemes have aimed to address these disparities. Programs such as the National Health Mission (NHM) and Ayushman Bharat–Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) are designed to strengthen primary health care and provide financial protection to the poor. However, evaluations suggest that while these programs have increased service coverage in some states, their implementation in Assam has been limited by weak infrastructure, inadequate human resources, and logistical bottlenecks (Patel et al., 2015; National Health Systems Resource Centre [NHSRC], 2019). In many rural and tribal areas, public health centers are understaffed, poorly

equipped, and difficult to reach, leading many to either forego care or seek private services despite financial hardship.

The divide between rural and urban populations is stark. Rural residents, who form more than 85% of Assam's population, rely heavily on public services, but these are often unavailable or substandard (NSSO, 2019). On the other hand, urban residents especially the economically better-off end to utilize private healthcare services, creating a dual system where access and quality are highly dependent on location and income. This disparity raises important questions about the equity of benefit distribution from public spending on health.

In this context, Benefit Incidence Analysis (BIA) becomes a crucial tool to assess who actually benefits from government health subsidies. BIA combines data on health service utilization with government expenditure data to evaluate whether public spending is more beneficial to the poor or the rich (O'Donnell et al., 2008). It provides an evidence-based measure of how equitably health benefits are distributed across different income groups and geographies.
BIA is complemented by concentration curves and concentration indices, which further quantify inequalities in health service utilization. A concentration index closer to zero indicates equitable use, whereas positive or negative values show whether the rich or the poor are disproportionately benefitting (Wagstaff & van Doorslaer, 2000). These methods provide a more nuanced understanding of healthcare distribution and reveal whether public health investments are truly aligned with social justice goals.

Existing national-level studies have shown that public health benefits in India tend to favor richer income quintiles, especially for outpatient and tertiary care services (Selvaraj & Karan, 2012). However, state-level analyses for Northeast India, particularly Assam, are limited. Given Assam's socio-economic diversity, high rural population, and cultural complexity, state-specific insights are essential for effective policy formulation.

This study seeks to fill that gap by applying the BIA framework to NSS 75th Round (2017–18) data for Assam. The analysis focuses on patterns of illness, healthcare utilization, and the benefit distribution of public health expenditure across income quintiles and rural-urban locations. The aim is to assess the extent to which public health financing is equitable in Assam and to identify policy gaps that need urgent attention.

By examining the socioeconomic divide in access to and benefit from healthcare services, the study contributes to the ongoing discourse on universal health coverage (UHC) in India. As the country moves toward its SDG targets, it becomes increasingly important to ensure that marginalized populations, such as those in Assam, are not left behind. The findings from this analysis can provide evidence for better resource allocation, more inclusive health policy design, and stronger institutional accountability.

Objectives of the Study

Despite ongoing health reforms and financial protection schemes, the equitable distribution and utilization of public healthcare services in Assam remain uneven. In this context, the present study aims to systematically explore the socioeconomic divide in health outcomes and public health

spending in the state. Drawing from nationally representative data and established equity assessment tools, the study sets out the following key objectives:

1. To examine the levels and patterns of morbidity and utilization of healthcare services across income quintiles in rural and urban Assam.

Assam presents a unique case of demographic and epidemiological transition, where both communicable and non-communicable diseases coexist. Understanding how illness patterns vary across income groups and residential locations (rural vs. urban) can help identify who bears the greatest burden of disease and how different population segments seek care. This objective focuses on:

- Identifying the nature and frequency of reported illnesses across economic groups.
- Comparing outpatient and inpatient service use across income quintiles and settlements.
- Highlighting regional disparities in health-seeking behaviour and service accessibility.

2. To estimate the benefit incidence of public health spending across income quintiles and settlements.

Government health subsidies are intended to reduce the financial burden on vulnerable groups. However, the actual benefit often depends on service utilization patterns, geographical access, and awareness levels. This objective applies the Benefit Incidence Analysis (BIA) framework to assess:

- Whether public spending is equitably distributed among different income groups.
- The share of total public health expenditure received by the poorest versus the richest quintiles.
- The differences in benefit distribution between rural and urban populations.

3. To assess the equity in health care utilization and health care expenditure by analysing disparities among different socioeconomic groups in Assam.

True progress toward Universal Health Coverage (UHC) involves ensuring that public health investments translate into equitable outcomes. This objective uses equity indices, such as concentration curves and concentration indices, to:

- Measure the degree of inequality in access to and use of healthcare services.
- Identify whether health care is pro-poor, pro-rich, or neutral in nature.
- Evaluate financial disparities in out-of-pocket expenditure (OOPE) across socioeconomic strata.

By addressing these objectives, the study aims to generate evidence that not only highlights existing inequities but also informs targeted policy interventions for improving health equity in Assam. The findings will serve as a vital input for state and national health planners to allocate resources more effectively and ensure that marginalized populations are adequately served.

Data and Methods

This study utilizes a cross-sectional analytical approach to examine the socioeconomic disparities in healthcare utilization and the distribution of public health benefits in Assam. The analysis is based on unit-level data from the 75th Round of the National Sample Survey (NSS)

on "Household Social Consumption: Health," conducted between July 2017 and June 2018 by the National Statistical Office (NSO) under the Ministry of Statistics and Programme Implementation (MoSPI), Government of India.

The NSS 75th Round provides comprehensive information on morbidity patterns, treatment-seeking behaviour, types of healthcare providers used (public or private), healthcare-related expenditures, and reasons for not using public facilities. The data is nationally representative and includes responses from over 100,000 households, with adequate sample coverage for reliable state-level analysis, including for Assam (MoSPI, 2019). Given its depth and scale, this dataset is suitable for examining differences in healthcare access across income groups and residential settings.

To analyse the distribution of illnesses and service utilization across socioeconomic groups, the population is categorized into income quintiles based on Monthly Per Capita Consumption Expenditure (MPCE). These quintiles serve as a proxy for economic status, allowing comparisons between the poorest and richest segments of the population in both rural and urban Assam. Descriptive and bivariate statistical methods are applied to understand differences in the prevalence of diseases and patterns of healthcare utilization across these income groups. Tables and frequency distributions are used to highlight the nature and burden of illnesses, and to examine whether poorer households differ significantly from richer ones in terms of their health-seeking behaviour.

In order to assess the fairness of healthcare use across income levels, the study employs established equity measurement tools such as equity ratios, concentration indices, and concentration curves. The concentration index summarizes the extent of inequality in the use of health services. A negative index value indicates a pro-poor distribution (where the poor use more services relative to their share of the population), while a positive value reflects a pro-rich distribution (Wagstaff & van Doorslaer, 2000). Concentration curves graphically represent the cumulative proportion of healthcare utilization against the cumulative proportion of the population ranked by income, offering a visual assessment of equity.

To quantify who benefits more from public health spending, the study applies the Benefit Incidence Analysis (BIA) framework. BIA is a well-established method used to evaluate the distribution of government health subsidies among different socioeconomic groups. It combines data on the utilization of public health services with information on government expenditure per unit of service. The goal is to estimate whether public subsidies are disproportionately captured by the poor or the rich (O'Donnell et al., 2008).

The mathematical expression for calculating the benefit share received by a particular income group j is given as:

Benefit Incidence Analysis: Mathematical Expression

The mathematical expression for calculatiing the benefit share received by a particular income group j is given as:

$$X = \sum_i \frac{U_{ij}}{U_i} \cdot S_i$$

Where:

X_i = Total benefit received by income group j

U_{ij} = Number of times individuals in income group j utilized service i

U_i = Total number of times serice i was utilized by all income groups

S_i = Unit subsidy (government spending) per episoda of service i

The values for S_i, representing government subsidies for each type of public health service (such as outpatient visits or inpatient admissions), are drawn from the National Health Accounts (NHA) Estimates for 2017–18 published by the Ministry of Health and Family Welfare (MoHFW, 2021). By integrating utilization data from NSS with expenditure data from NHA, the analysis provides an estimate of the monetary value of public health benefits received by each income group in Assam

Result

The outpatient morbidity profile in Assam, based on NSS 75th Round data (2017–18), highlights clear differences between rural and urban areas.

In rural areas, infections were the most common ailment, accounting for 48.1% of cases, followed by respiratory issues (14.0%), psychiatric disorders (7.0%), musculoskeletal problems (6.6%), and cardiovascular diseases (6.5%). The dominance of infections reflects inadequate sanitation and healthcare access in rural regions.

In urban areas, infections remained the leading cause of outpatient visits (43.4%), but a wider range of ailments was observed. Endocrine disorders (12.8%), cardiovascular diseases (11.2%), respiratory conditions (10.3%), and psychiatric disorders (9.9%) featured prominently, indicating a shift toward chronic and lifestyle-related diseases in urban populations.

The contrast suggests a dual disease burden in the state: rural areas face higher infectious and environmental health risks, while urban regions experience more non-communicable and metabolic disorders. These findings underline the need for location-specific health strategies and equitable allocation of healthcare resources.

Table 1 Percentage distribution of morbidity in Rural and Urban Areas in Assam for Outpatient care, 2017-18

Rural			Rank	Urban		
Nature of Ailment	n	%		Nature of Ailment	n	%
Infections	124	48.1	1	Infections	70	43.4
Respiratory	36	14.0	2	Endocrine	21	12.8
Psychiatric	18	7.0	3	Cardiovascular diseases	18	11.2
Musculo-skeletal	17	6.6	4	Respiratory	17	10.3
Cardiovascular diseases	17	6.5	5	Psychiatric	16	9.9
Gastro–intestinal	14	5.5	6	Gastro–intestinal	8	5.3
Endocrine	12	4.5	7	Genito–urinary	5	3.1
Injuries	9	3.4	8	Musculo-skeletal	3	2.0
Eye	4	1.7	9	Injuries	1	0.6
Skin	3	1.3	10	Skin	1	0.5
Cancers	3	1.1	11	Others	1	0.4
Blood Disorders	0	0.1	12	Cancers	0	0.2
Genito–urinary	0	0.1	13	Eye	0	0.2
Others	0	0.1	14	Obstetrics	0	0.2
Obstetrics	0	0.0	15	Ear	0	0.1
Ear	0	0.0	16	Blood Disorders	0	0.1
Total	258	100		Total	161	100

Source: Authors' computation based on NSS 75th round data
Note: All 'n' and % are weighted Assam

In rural areas, infections were the leading cause of hospitalization, accounting for 26.1% of cases, followed by gastrointestinal disorders (14.4%), injuries (13.8%), and cardiovascular diseases (9.9%). Obstetric-related admissions accounted for 6.4%, highlighting reproductive health needs in rural populations.

In urban areas, gastrointestinal issues were most reported (16.2%), closely followed by infections (15.8%) and injuries (14.3%). Cardiovascular diseases (12.6%) and psychiatric disorders (9.6%) were also significant contributors to hospital admissions, indicating a higher burden of non-communicable diseases in urban settings.

Overall, rural areas showed higher prevalence of infections and obstetric cases, while urban areas reflected a more diverse profile, including chronic and mental health conditions. These findings reinforce the need for differentiated inpatient care strategies tailored to local health burdens.

Table 2 Percentage distribution of morbidity in Rural and Urban Areas in Assam for Inpatient care, 2017-18

Rural			Rank	Urban		
Nature of Ailment	n	%		Nature of Ailment	n	%
Infections	286	26.1	1	Gastro–intestinal	82	16.2
Gastro–intestinal	158	14.4	2	Infections	80	15.8
Injuries	151	13.8	3	Injuries	72	14.3
Cardiovascular diseases	109	9.9	4	Cardiovascular diseases	64	12.6
Obstetrics	70	6.4	5	Psychiatric	48	9.6
Genito–urinary	55	5.0	6	Genito–urinary	34	6.7
Psychiatric	54	4.9	7	Musculo-skeletal	26	5.2
Musculo-skeletal	47	4.3	8	Respiratory	22	4.4
Eye	40	3.7	9	Endocrine	20	4.0
Endocrine	25	2.3	10	Cancers	14	2.8
Others	22	2.0	11	Eye	13	2.6
Respiratory	21	2.0	12	Skin	10	2.0
Blood Disorders	21	1.9	13	Blood Disorders	8	1.6
Cancers	18	1.6	14	Obstetrics	6	1.3
Ear	10	0.9	15	Others	3	0.6
Skin	9	0.9	16	Ear	1	0.2
Total	1,095	100		Total	505	100

Source: Authors c computation based on NSS 75th round data
Note: All 'n' and % are weighted

Data shown in Table 3 highlights the distribution of morbidity across income quintiles and place of residence in Assam for both outpatient and inpatient care, based on the NSS 75th Round (2017–18).

For outpatient care, the majority of reported morbidity in rural areas was concentrated among the poorest (41.8%) and poorer (34.1%) quintiles. In contrast, urban areas showed a markedly different pattern, where the richest quintile accounted for the largest share (45.3%) of outpatient cases, while the poorest represented only 2.0%. This reflects clear economic disparities in access and reporting, with rural outpatient care predominantly serving lower-income groups and urban care being accessed more by higher-income groups.

In the case of inpatient care, a similar socioeconomic gradient is observed. In rural areas, the poorest (35.7%) and poorer (29.9%) groups made up nearly two-thirds of total

hospitalizations. However, in urban areas, the richest quintile contributed the highest proportion of inpatient cases (55.5%), compared to only 6.5% from the poorest.

Overall, the findings indicate a strong income-based disparity in healthcare utilization. Rural health facilities are primarily accessed by economically weaker sections, while urban healthcare, both outpatient and inpatient, is disproportionately utilized by the wealthier population. This emphasizes the need for targeted policy interventions to address inequities in healthcare access and service delivery across socioeconomic groups in Assam

Table 3 Distribution of morbidity by economic status and place of residence in Assam for inpatient and outpatient care, 2017-18

MPCE Quintile	Percentage of morbidity- Outpatient care					
	Rural		Urban		Total	
	n	%	N	%	n	%
Poorest	108	41.8	3	2.0	141	33.6
Poorer	88	34.1	45	27.7	137	32.8
Middle	38	14.5	19	11.6	58	13.9
Richer	19	7.5	22	13.4	36	8.7
Richest	5	2.1	73	45.3	46	11.0
All	258	100	161	100	419	100
MPCE Quintile	Percentage of morbidity- Inpatient care					
	Rural		Urban		Total	
	n	%	n	%	n	%
Poorest	376	35.7	31	6.5	457	29.8
Poorer	316	29.9	31	6.6	387	25.2
Middle	226	21.5	55	11.4	298	19.4
Richer	112	10.6	95	20.0	191	12.5
Richest	25	2.3	265	55.5	200	13.0
Assam	1,055	100	478	100	1,533	100

Source: Authors c computation based on NSS 75th round data
Note: All 'n' and % are weighted.

From Table 4 it is evident that the treatment-seeking behaviour by economic status and type of health facility used for both inpatient and outpatient care in Assam, based on NSS 75th Round (2017–18).

For inpatient care, utilization of public health facilities was highest among the poorest (77.8%), poorer (75.1%), and middle-income (79.5%) groups. In contrast, use of private facilities increased with income, reaching 60.3% among the richest quintile, while only 19.0% of the poorest opted for private hospitalization. This indicates that poorer groups rely more heavily on public services, likely due to cost constraints, whereas the wealthier prefer private hospitals for inpatient treatment.

For outpatient care, the trend was similar but more pronounced. The poorest quintile reported 59.3% use of public services, while the richest quintile overwhelmingly used private providers (76.6%). As income increases, reliance on private outpatient care becomes dominant, reflecting differences in perceived quality, accessibility, and affordability.

Therefore, the data confirms significant income-based disparities in healthcare utilization patterns. Public healthcare

services are primarily used by the lower-income population, whereas higher-income groups prefer private care, especially for outpatient services. These findings underscore the importance of strengthening public healthcare infrastructure to ensure equitable access across all economic groups.

Table 4 Distribution of utilization by economic status and types of health facility in Assam for Outpatient care and Inpatient care NSS, 2017-18

MPCE Quintile	Treatment-seeking behavior by types of health facility- Inpatient care			
	Public		Private	
	n	%	n	%
Poorest	306	77.8	73	19.0
Poorer	291	75.1	78	22.8
Middle	258	79.5	57	19.5
Richer	138	63.2	84	34.0
Richest	85	38.3	137	60.3
All	1,078	70.5	429	27.3
	Treatment-seeking behavior by types of health facility-Outpatient care			
MPCE Quintile	Public		Private	
	n	%	n	%
Poorest	36	59.3	37	40.7
Poorer	28	39.4	36	60.6
Middle	21	45.4	37	54.6
Richer	13	21.3	39	78.7
Richest	10	23.4	58	76.6
All	108	43.0	207	57.0

Source: Authors computation based on NSS 75th round data
Note: All 'n' and % are weighted

Table 5, illustrates the utilization of public health facilities for outpatient and inpatient care across income groups and regions in Assam during 2017–18.

In rural areas, public health facility use was significantly higher across all income groups, especially for inpatient care. The poorest rural quintile reported 79.2% inpatient and 60.2% outpatient utilization, while even the middle-income group showed high public reliance for inpatient services (80.9%). In contrast, urban areas showed lower usage overall, with the richest urban quintile reporting only 40.4% inpatient and 23.1% outpatient use of public facilities.

At the state level, public inpatient services were used more broadly (70.5% overall), particularly by the poorest (77.8%), confirming their critical role in rural and low-income healthcare. Outpatient use was more limited, with just 43.0% of total cases relying on public care.

These patterns indicate that rural and poorer populations depend more on public health facilities, while urban and wealthier groups tend to seek private care, especially for outpatient services. The findings highlight the ongoing need to strengthen and expand public services to reduce access gaps.

Table 6, presents the distribution of public health spending benefits across income groups in urban and rural Assam using Benefit Incidence Analysis (BIA). The data clearly reflects inequities in the share of government health subsidies, with contrasting patterns observed between rural and urban populations.

In urban areas, the wealthier population benefitted disproportionately from public spending. The richest quintile captured 30.8% of the total health subsidy, while the poorest quintile received only 6.8%. For both outpatient and inpatient care, benefits increased with income suggesting that public funds in urban Assam tend to favor better-off households, possibly due to higher awareness, access to facilities, and better health-seeking behavior.

In contrast, rural areas displayed a more pro-poor distribution. The poorest and poorer quintiles together accounted for 66.8% of the total benefit (35.6% and 31.2%, respectively), while the richest rural quintile received just 1.0%. This suggests that public health services in rural regions are more effectively reaching economically disadvantaged groups, aligning with the intended equity goals.

At the state level (Assam overall), the bottom 40% (poorest and poorer) received over 55% of the total benefit from public health spending, while the top 20% received only 8%. Though rural distribution remains pro-poor, the aggregated figures reveal a modest tilt toward middle and richer urban groups, especially in outpatient care.

This differential benefit pattern underscores the need to improve equity in urban public health systems, where wealthier populations disproportionately capture public subsidies. At the same time, the rural system appears more equitable, indicating that efforts to strengthen rural public health infrastructure have helped target low-income households more effectively.

Table 5 Utilization of public health facility in 2017-18

MPCE Quintile	Outpatient care		Inpatient care	
	%	N	%	N
		Urban		
Poorest	10.3	1	47.9	18
Poorer	18.9	2	59.3	34
Middle	22.3	5	68.9	55
Richer	30.7	8	54.2	70
Richest	23.1	8	40.4	78
Urban	22.6	24	48.1	255
		Rural		
Poorest	60.2	35	79.2	288
Poorer	46.2	26	76.0	257
Middle	53.1	16	80.9	203
Richer	15.5	5	67.5	68
Richest	36.6	2	25.6	7
Rural	50.6	84	76.1	823
		Assam		
Poorest	59.3	36	77.8	306
Poorer	39.4	28	75.1	291
Middle	45.4	21	79.5	258
Richer	21.3	13	63.2	138
Richest	23.4	10	38.3	85
Assam	43.0	108	70.5	1,078

Source: Authors c computation based on NSS 75th round data

Table 6 Benefit Incidence of Public Spending on Health, by MPCE Quintile and Services, in Assam, (Amount in INR lakh = 100,000) NSS, 2017-18

MPCE Quintile	Outpatient care		Inpatient care		Any Service	
	Total Benefit	*Share of Benefit (Percent)*	*Total Benefit Amount (INR)*	*Share of Benefit (Percent)*	*Total Benefit Amount (INR)*	*Share of Benefit (Percent)*
			Urban			
Poorest	3	4.2	49	7.1	52	6.8
Poorer	5	8.3	93	13.3	99	12.9
Middle	14	20.8	151	21.6	164	21.5
Richer	22	33.3	192	27.5	214	28.0
Richest	22	33.3	214	30.6	236	30.8
Urban	66	100	699	100	765	100
% share	8		92		100	
			Rural			
Poorest	96	41.7	789	35.0	885	35.6
Poorer	71	31.0	704	31.2	776	31.2
Middle	44	19.0	556	24.7	600	24.1
Richer	14	6.0	186	8.3	200	8.0
Richest	5	2.4	19	0.9	25	1.0
Rural	230	100	2256	100	2486	100
% share	9		91		100	
			Assam			
Poorest	99	33.3	839	28.4	937	28.8
Poorer	77	25.9	798	27.0	874	26.9
Middle	58	19.4	707	23.9	765	23.5
Richer	36	12.0	378	12.8	414	12.7
Richest	27	9.3	233	7.9	260	8.0
Assam	296	100.0	2955	100	3251	100
% share	9		91		100	

Source: Author's computation based on NSS 75th round data and NHA data.

Figures 1 and 2, illustrate the reasons for not utilizing public health facilities for inpatient and outpatient care in Assam. The most commonly cited barriers include poor quality of care, long waiting times, unavailability of doctors or medicines, and facility distance. These issues were more frequently reported in rural areas, indicating persistent structural gaps in rural healthcare delivery. In urban settings, preference for private providers and perceptions of better service quality often drive patients away from public options.

Figures 3 and 4 present concentration curves for public service utilization by place of residence. The curves lie above the line of equality, especially for rural residents, confirming a pro-poor distribution of public healthcare use. Rural households, particularly from lower-income groups, are more dependent on public services for both outpatient and inpatient care.

Figures 5 and 6 assess utilization by educational attainment. The curves suggest that individuals with lower education levels rely more on public services, reaffirming the

linkage between educational disadvantage and public healthcare dependence. Those with higher education levels tend to opt for private services, likely due to better awareness, affordability, and perceived quality.

Figures 7 and 8 examine gender-based patterns. The concentration curves indicate that female utilization of public services is slightly more concentrated among the lower end of the socioeconomic distribution. This implies that public services play a crucial role in ensuring access to care for socioeconomically disadvantaged women, particularly in rural areas.

Overall, the analysis of Figures 1–8 reveals that while public health services in Assam are largely pro-poor, significant barriers especially related to quality and access still deter utilization, particularly in urban areas and among more educated or wealthier groups. These findings emphasize the need for systemic improvements in service delivery, staffing, and infrastructure to retain trust in public healthcare across all segments of the population.

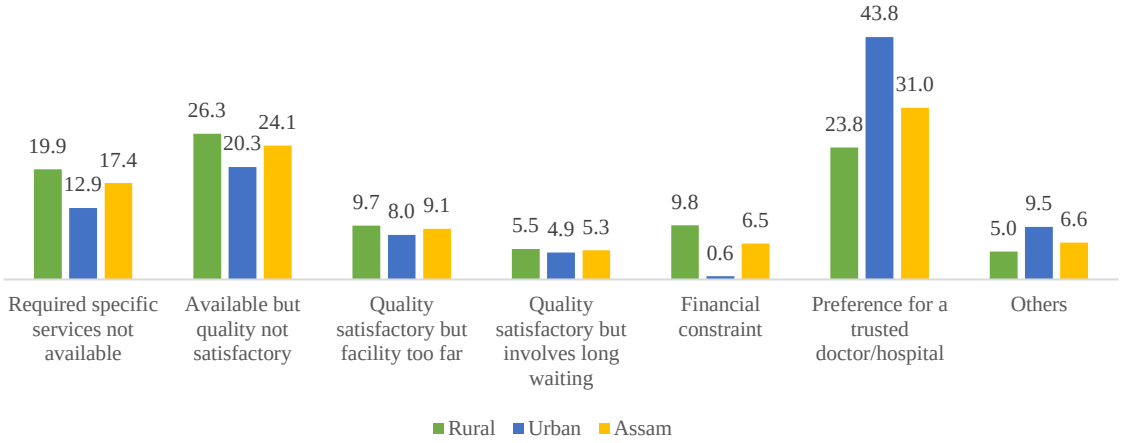

Figure 1 Percentage distribution of reasons for not taking treatment for inpatient care from public health facilities by place of residence in Assam, 2017-2018

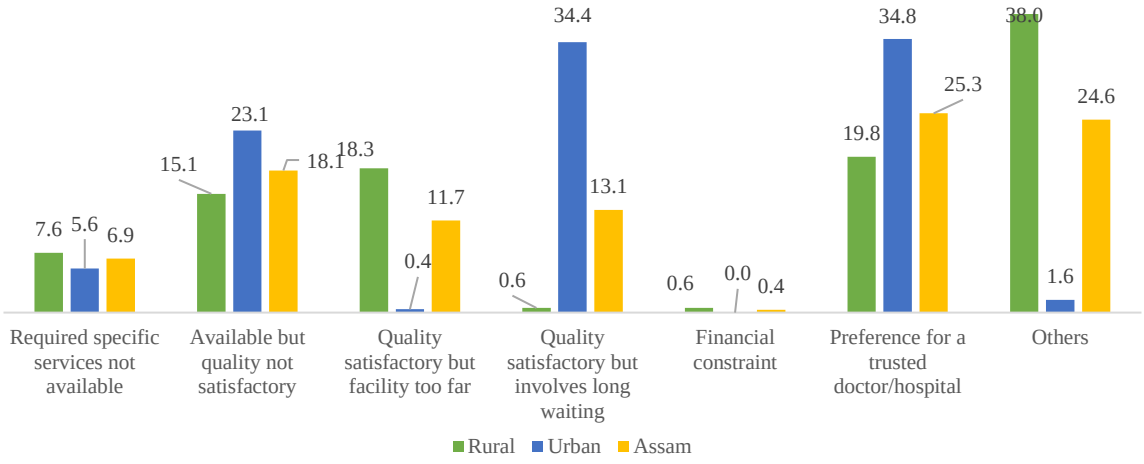

Figure 2 Percentage distribution of reasons for not taking treatment for outpatient care from public health facilities by place of residence in Assam, 2017-2018

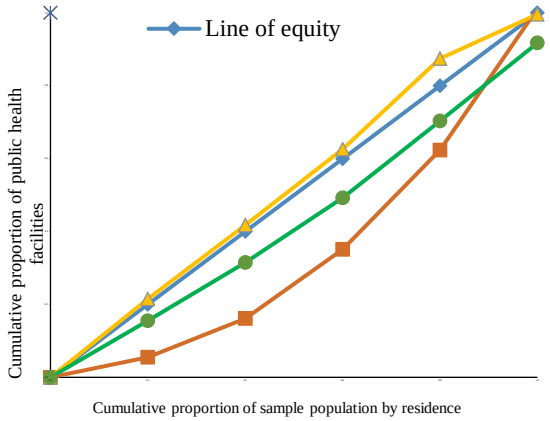

Figure 3 Concentration curves for utilization of public service for outpatient care by place of residence

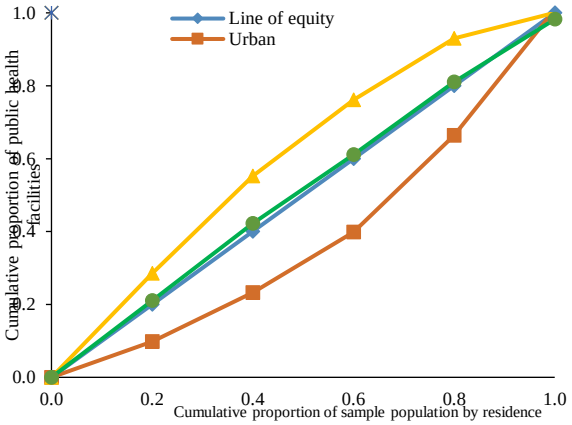

Figure 4 Concentration curves for utilization of public service for inpatient care by place of residence

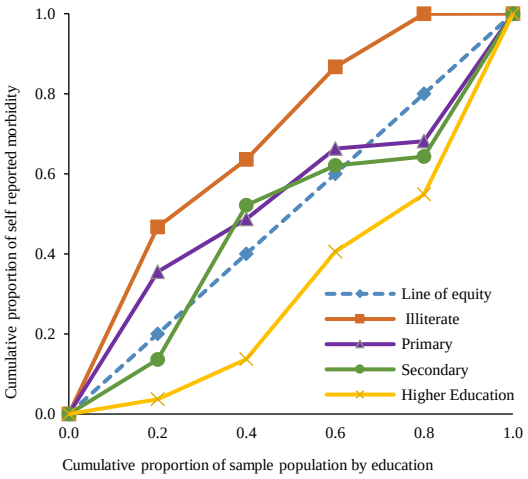

Figure 5 Concentration curves for utilization of public service for outpatient care by Education

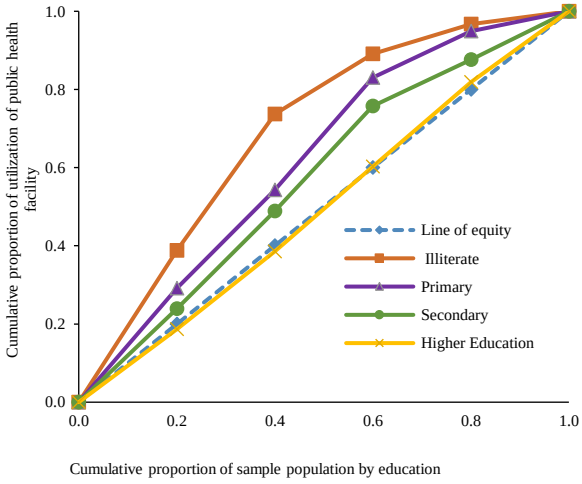

Figure 6 Concentration curves for utilization of public service for inpatient care by Education

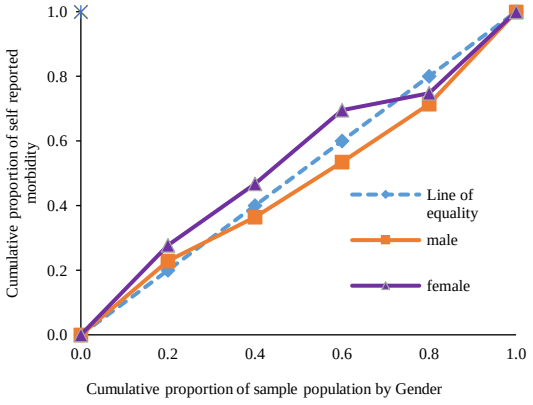

Figure 7 Concentration curves for utilization of public service for outpatient care by Gender

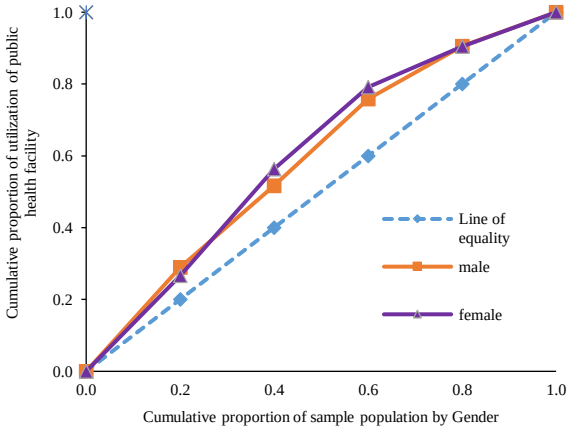

Figure 8 Concentration curves for utilization of public service for inpatient care by Gender

This study assessed the equity of public healthcare access and benefit distribution in Assam, highlighting critical gaps through Benefit Incidence Analysis (BIA) of NSS 75th Round data. The findings reveal that while public healthcare remains a lifeline for lower-income and rural populations, stark inequalities persist in urban areas, where wealthier households disproportionately benefit from government subsidies. These results reaffirm long-standing evidence on India's healthcare inequalities, both in access and in financial protection (Joe, Mishra, & Navaneetham, 2008; Berman, Ahuja, & Bhandari, 2010).

The observed pro-poor trend in rural inpatient utilization reflects successful targeting of public spending; however, this success is undermined in urban areas by inequitable benefit capture by higher income groups. The better-off often have more knowledge of entitlements, proximity to well-equipped facilities, and higher educational attainment, which facilitate access (Sen, 2002; Kumar & Prakash, 2019). Meanwhile, barriers such as absence of medical staff, long waiting times, and poor quality of services deter low-income urban populations from utilizing public facilities, pushing them toward costly private options (Ghosh, 2011; NHSRC, 2019). High out-of-pocket expenditure (OOPE) continues to be a defining concern in Assam, with rural residents most vulnerable to catastrophic health costs, a finding consistent with earlier studies on financial impoverishment due to medical spending (Ghosh, 2011; Xu et al., 2003). Despite government efforts through schemes like NHM and AB-PMJAY, their implementation remains suboptimal in the state due to weak institutional capacity and insufficient health personnel (Prinja et al., 2017; Patel et al., 2015).

Concentration curves and indices confirmed that public healthcare use in rural Assam is more equitable compared to urban settings, especially among women and those with less education. This supports the argument that public systems are critical for advancing health equity but must be improved to address intersectional vulnerabilities (Wagstaff & van Doorslaer, 2000; Kumar et al., 2015). Additionally, the double burden of disease, with infections prevalent in rural areas and non-communicable diseases (NCDs) rising in urban settings; demands differentiated service delivery. A lack of health system readiness to address chronic diseases in rural areas may widen these gaps if not addressed urgently (NITI Aayog, 2020; MoHFW, 2021).

In essence, this study strengthens the case for tailored investment in health infrastructure, especially in underserved rural and urban-poor regions, while improving awareness and quality of care to ensure equitable benefit realization from public spending (Selvaraj & Karan, 2012; O'Donnell et al., 2008).

Conclusion

This study highlights the persisting inequities in healthcare utilization and public health spending distribution in Assam. Rural and poorer households are more dependent on public services, particularly for inpatient care, where the system appears to be somewhat equitable. However, urban public healthcare benefits are disproportionately accessed by wealthier groups, reflecting socio-economic and informational disparities. High OOPE, inadequate outpatient coverage, and low-quality service delivery remain critical barriers, especially among vulnerable

groups like women, less-educated individuals, and the urban poor (Joe et al., 2008; Ghosh, 2011).

To move towards Universal Health Coverage, Assam must prioritize strengthening both primary and outpatient care, especially in low-income urban neighborhoods, and address bottlenecks in healthcare delivery infrastructure. Enhanced financial allocations, better human resource planning, and community outreach are essential to improve awareness and access. Programs like AB-PMJAY need state-specific adaptations and performance monitoring to achieve their intended equity goals (Prinja et al., 2017; NHSRC, 2019). Finally, integrating the principles of health equity and intersectionality into policy implementation can ensure that no group is left behind as India pursues its Sustainable Development Goals (Sen, 2002; WHO, 2010).

Ethical Considerations

This study relied entirely on publicly available, de-identified secondary data from the NSS 75th Round and National Health Accounts, ensuring full compliance with ethical standards for data use. As no human participants were directly involved, issues of informed consent and personal privacy were not applicable.

Strengths and Limitations

A major strength of this study is its robust methodological framework using nationally representative data and the BIA approach, enabling reliable assessment of equity in public health expenditure. The analysis also distinguishes between rural and urban contexts and uses concentration indices for a multidimensional understanding. However, limitations include the cross-sectional nature of the data, which restricts causal interpretation. Furthermore, the NSS data may not capture unreported or informal healthcare usage, potentially underestimating utilization among marginalized populations.

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Appendix

Table 1 State-Wise Public Health Expenditure and Public-Private Share of Health Spending in India

States	[1]Total Public Expenditure (INR)				[2]Total Population	Shares of public and private expenditure	
	Revenue Expenditure	Capital Expenditure	Others	Total Public Expenditure		% Share of Public	[3]%Share of Private
Assam	3162.3	54.0	34.1	3250.5	3.3	39.0	61.0
Andhra Pradesh	6044.0	450.5	37.3	6531.9	6.3	24.5	75.5
Bihar	4622.5	905.9	52.2	5580.6	11.4	21.3	78.7
Chhattisgarh	2967.3	331.3	12.2	3310.8	2.8	33.9	66.1
Gujarat	6241.8	1578.9	60.5	7881.2	6.4	38.6	61.4
Haryana	2800.2	285.0	6.8	3092.0	2.7	29.6	70.4
Himachal Pradesh	1501.3	318.8	20.6	1840.6	0.7	51.2	48.8
Jammu and Kashmir	2375.5	442.8	27.4	2845.7	1.3	38.8	61.2
Jharkhand	1967.7	511.5	26.4	2505.6	3.6	31.0	69.0
Karnataka	6139.2	920.6	33.0	7092.8	6.6	26.8	73.2
Kerala	5731.1	351.6	49.4	6132.1	3.5	26.6	73.4
Madhya Pradesh	5375.6	628.2	26.1	6029.9	7.8	28.7	71.3
Maharashtra	10121.4	605.5	107.7	10834.6	12.1	23.3	76.7
Odisha	4061.3	670.3	89.0	4820.6	4.5	27.3	72.7
Punjab	2867.8	55.5	31.5	2954.8	2.9	19.8	80.2
Rajasthan	7737.8	630.4	22.1	8390.3	7.5	33.0	67.0
Tamil Nadu	7953.5	1735.0	76.0	9764.5	7.7	27.3	72.7
Uttar Pradesh	12861.5	3054.2	74.4	15990.1	21.8	22.2	77.8
Uttarakhand	1390.2	176.5	0.7	1567.4	1.1	36.1	63.9
West Bengal	7020.8	1329.6	237.5	8587.9	9.6	21.2	78.8
India	102943	15036.0	1024.9	119003.9	123.6	26.6	73.4

Source: 1. Ministry of Health and Family Welfare (MoHFW). (2021). 2. National Health Accounts Estimates for India (2017–18). Government of India.
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