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2. Socio-Economic Determinants of Fertility and Mortality in North East India (Secondary Data Analysis)

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Abstract

Fertility and mortality are two of the three primary components of population dynamics that influence the population growth, structure and composition. Both are the key indicators of the population health and it plays important role in national planning for the social and national development of the country as well. Using secondary data from the National Family Health Survey (NFHS-5, 2019-21), the Sample Registration System (SRS, 2019-21), the Census of India (2011), and NITI Aayog's National Multidimensional Poverty Index (2021), this paper examines how socio-economic variables, including female literacy, urbanization, contraceptive prevalence, household wealth, and women's autonomy shape fertility and mortality outcomes in North Eastern region. The findings reveals that the region's Total Fertility Rate (TFR) ranges from a low of 1.1 in Sikkim to a high of 2.9 in Meghalaya, against the national average of 2.0. Infant Mortality Rate (IMR) varies between 12 per 1,000 live births in Sikkim and 35 in Meghalaya, while Maternal Mortality Ratio (MMR) exhibits alarming levels in Arunachal Pradesh (284), Manipur (282), and Meghalaya (266) per 100,000 live births. The findings confirm that female education, contraceptive access, institutional delivery coverage, and economic empowerment are the most powerful predictors of both fertility decline and mortality reduction.

Keywords: *Fertility, Mortality, North East India, TFR, IMR, MMR, Socioeconomic Factors*

Introduction

The demographic scenery of North East India occupies a unique space in the broader narrative of India's population transition. The region has a unique demographic mix with a mix of Hinduism, Christianity and Islam and is a mosaic of different ethnic groups. Fertility and mortality in North East India have experienced a significant demographic transition. While national-level indicators have

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improved steadily — with India's TFR reaching 2.0 in 2019-21[1], the eight states of the north-eastern region display a striking internal divergence.. Some states, like Sikkim and Mizoram, have long since passed through demographic transition and now record fertility rates below replacement level. Others, like Meghalaya and Manipur, continue to carry TFRs above 2.1, the internationally recognized replacement threshold.

This divergence matters for at least two reasons. First, demographic heterogeneity within a region signals unequal distribution of development, healthcare access, and social capital, all factors with consequences for the lived experience of millions of people. Second, the north-eastern states share international borders with China, Bhutan, Nepal, Myanmar, and Bangladesh, making demographic stability in the region a matter of national strategic importance.[2]

Despite this significance, North East India remains underrepresented in demographic scholarship, partly because several of its smaller states were historically excluded from early rounds of the NFHS, and partly because of the genuine complexity of collecting data in hilly, forest-covered, and ethnically diverse terrain. The fifth round of the NFHS (2019-21) provides the most comprehensive district-level data ever compiled for the region, making this an opportune moment for systematic analysis.[3]

This paper has four objectives:

(i) To document current levels of fertility and mortality across the eight north-eastern states using the latest government data

(ii) To identify the principal socio-economic determinants of fertility and mortality

(iii) To trace trends in fertility and mortality over successive NFHS rounds and

(iv) To derive policy implications sensitive to the region's distinctive character.

The analysis based entirely on secondary data from authenticated government sources, including NFHS-5,[1] the SRS Special Bulletin on Maternal Mortality 2019-21,[4] the Census of India 2011,[5] and NITI Aayog's National Multidimensional Poverty Index 2021.[6]

The classical theory of demographic transition — developed by Notestein[7] and later refined by Caldwell[8] suggests that fertility and mortality decline together as societies modernize, passing through a sequence of stages linked to rising incomes, urbanization, and improved education. India's own demographic history broadly conforms to this pattern, though with considerable regional variation that the classical model does not fully explain.

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Studies specific to North East India are relatively less. Borbora and Das[9] noted that while some north-eastern states had already achieved below-replacement fertility by the early 2000s, health infrastructure deficits continued to sustain elevated maternal and child mortality. Their work underscored the importance of separating fertility trends from mortality trends rather than treating them as a unified transition. Narayana[10] documented the role of tribal customary practices and matrilineal kinship structures prevalent in Meghalaya and parts of Mizoram in shaping fertility preferences distinct from mainland Indian norms, challenging the assumption that rising female literacy would mechanically reduce fertility across all cultural contexts.

The relationship between female education and fertility has been consistently supported in the Indian context. Ram et al.[11] found, using NFHS-5 data, that women with 12 or more years of education have a TFR of 1.7, compared to 2.8 for those with no education, a difference of more than a full child per woman. Meh et al.[12] demonstrated that maternal mortality risks remain highest in rural and tribal areas of north-eastern and northern states, even after adjusting for education and other observable characteristics, pointing to structural healthcare supply-side failures that education cannot compensate for on its own.

Mukherjee and Saikia[13] studied intra-regional disparities in child health outcomes within the north-east and found that access to institutional delivery was the single strongest predictor of neonatal mortality reduction, more powerful than any socioeconomic variable alone. Their findings align with the broader literature suggesting that supply-side healthcare infrastructure matters greatly in remote hilly regions where demand-side factors like education may take longer to translate into behavioural change on the ground.

More recently, a 2024 ORF analysis[14] of NFHS-5 data found that the nutritional and mortality situation in North East India is distinctly mixed: states like Sikkim show remarkable improvements while Meghalaya, Manipur, and Tripura have registered deterioration in child mortality rates even as fertility has declined. This declining fertility alongside rising child mortality in some states points to the limits of fertility-centric analysis and strengthens the case for examining mortality determinants independently.

Data and Methodology

Data Sources

This study relies completely on secondary data from the following authenticated government and institutional sources:

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(i) National Family Health Survey-5 (NFHS-5), 2019-21: Conducted by the International Institute for Population Sciences (IIPS), Mumbai, under the Ministry of Health and Family Welfare (MoHFW), Government of India. NFHS-5 covered 6,36,699 households across 707 districts, interviewing 7,24,115 women aged 15-49 and 1,01,839 men aged 15-54. It provides state-level and district-level estimates of fertility, mortality, nutrition, family planning, and women's empowerment indicators.[3]

(ii) Sample Registration System (SRS), 2019-21: Published by the Office of the Registrar General, India (RGI), the SRS provides annual state-wise estimates of Infant Mortality Rate, Neonatal Mortality Rate, and through the SRS Special Bulletin on Maternal Mortality — the only official MMR estimates at state level. Since the SRS MMR bulletin covers only states with statistically adequate sample sizes, Assam is the only north-eastern state with directly published SRS MMR data. MMR figures for the remaining seven states are drawn from HMIS-triangulated estimates published in peer-reviewed literature (Sharma et al., 2023).[4, 15]

(iii) Census of India 2011: Used for female literacy rates, urbanization percentages, and population density figures for each north-eastern state.[5]

(iv) NITI Aayog National Multidimensional Poverty Index (MPI) 2021: Provides state-level multidimensional poverty scores based on NFHS-4 and NFHS-5 data, covering deprivations across education, health, and standard of living simultaneously.[6]

Analytical Approach

The study employs descriptive statistical analysis to examine state-wise variation in TFR, IMR, MMR, and their socio-economic correlates. Trend analysis compares NFHS-3 (2005-06), NFHS-4 (2015-16), and NFHS-5 (2019-21) data to capture the trajectory of change over approximately 15 years. The analysis identifies associations between fertility and mortality outcomes and socioeconomic indicators including female literacy rate, contraceptive prevalence rate (CPR), institutional birth rate, urbanisation, and child marriage prevalence. All data are presented in structured tables, and patterns are interpreted in light of the theoretical frameworks discussed in the literature review.

Given that official SRS MMR data for the smaller north-eastern states is not published in regular SRS bulletins due to sample size constraints, this study draws on district-level HMIS-triangulated estimates from Sharma et al. (2023),[15] which uses the Health Management Information System, SRS, and Census of India data in combination.

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Demographic and Socio-Economic Profile of North East India

The north-eastern region covers approximately 7.9% of India's total geographic area but accounts for only around 3.8% of the national population as per Census 2011.[5] The eight states are ecologically diverse, ranging from the vast floodplains of Assam — the only state in the region without a predominantly hilly geography — to the high-altitude terrain of Arunachal Pradesh and the bamboo-forested hills of Mizoram. Only a narrow land corridor, the Siliguri Corridor or 'Chicken's Neck', connects seven of the eight states to mainland India, creating distinctive logistical challenges for service delivery.[2]

Socially, the region is among the most ethnically diverse in Asia, with hundreds of distinct tribal groups, multiple major religions — including Christianity in Mizoram, Nagaland, and Meghalaya; Hinduism and Islam in Assam and Tripura; Buddhism in Sikkim and Arunachal Pradesh — and customary legal systems running parallel to formal law. Matrilineal societies, most prominently the Khasi and Garo communities of Meghalaya and certain groups in Mizoram, challenge the patriarchal demographic models typically applied to India. Literacy rates are generally above the national average in Mizoram, Tripura, Nagaland, and Manipur, reflecting a strong tradition of church-based and missionary education going back to the nineteenth century.[9]

Economically, most north-eastern states are characterised by a large public sector, limited industrial development, high dependence on agriculture and forest resources, and substantial central government transfers. Per capita Net State Domestic Product varies considerably: Sikkim benefits from hydropower revenues and recorded the highest per capita NSDP among north-eastern states in recent years, while Assam, Manipur, and Meghalaya combine lower per capita incomes with higher poverty ratios. The NITI Aayog MPI 2021 found that multidimensional poverty headcount was highest in Assam among the north-eastern states, with significant deprivations in health, education, and standard of living simultaneously.[6]

Results and findings

State-wise Fertility and Mortality Indicators

Table 1 presents the core fertility and mortality indicators for all eight north-eastern states, benchmarked against the all-India average from NFHS-5 and SRS 2019-21.

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Table 1: State-wise Fertility and Mortality Indicators, North East India (NFHS-5, 2019-21)

State	TFR NFHS-4 (2015-16)	TFR NFHS-5 (2019-21)	IMR NFHS-5 (per 1,000 LB)	U5MR NFHS-5 (per 1,000 LB)	MMR* (per 1,00,000 LB)
Arunachal Pradesh	2.7	1.8	29	35	284**
Assam	2.2	1.9	32	39	195
Manipur	2.6	2.2	30	37	282**
Meghalaya	3.3	2.9	35	43	266**
Mizoram	2.1	1.9	22	28	131
Nagaland	2.4	1.7	28	34	143
Sikkim	1.2	1.1	12	15	228**
Tripura	1.7	1.7	25	31	119
All India	**2.2**	**2.0**	**35**	**42**	**93**

*Note: LB = Live Births. MMR for Assam is from SRS Special Bulletin 2019-21;[4] states marked ** use HMIS-triangulated estimates.[15] All NFHS-5 data from MoHFW/IIPS. [1,3]*

The data in Table 1 reveal several striking patterns. Meghalaya emerges as the state with the highest TFR (2.9) in the region and among the highest in India. Its fertility remains well above replacement level despite being classified as a relatively high-literacy state — a paradox explored further in Section 6. Manipur also retains an above-replacement TFR of 2.2, making it one of only a handful of Indian states above 2.1 as per NFHS-5.[1]

At the other end, Sikkim (TFR 1.1) represents the lowest fertility in the entire country, surpassing even the traditionally low-fertility southern states. The state has benefited from strong institutional delivery coverage (94.7%), high female educational attainment, good contraceptive uptake (CPR 71.3%), and the lowest child marriage rate in the region (9.5%). Mizoram (TFR 1.9), Nagaland (1.7), and Arunachal Pradesh (1.8) have also completed the fertility transition, their rates now at or below replacement level.[3]

So far as mortality is concern, the picture is more troubling. Assam's IMR of 32 per 1,000 live births represents a significant decline from 48 in NFHS-4, one of the major improvements recorded

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anywhere in India between the two survey rounds[3], yet it remains higher than the national average of 35.

More worryingly, Manipur (IMR 30 in NFHS-5, up from 21 in NFHS-4), Meghalaya (IMR 35, up from 30), and Nagaland (IMR 28, up from 26) have recorded an increase in infant mortality.[14]

Maternal mortality remains extremely high in several north-eastern states. Arunachal Pradesh (MMR 284), Manipur (MMR 282), and Meghalaya (MMR 266), all record levels more than double the national average of 93.[4], [15] Only Tripura (MMR 119) and Mizoram (MMR 131) approach the national figure, reflecting their comparatively stronger healthcare infrastructure and higher institutional delivery rates.

Socio-Economic Determinants of Fertility

Table 2: Socio-Economic Determinants of Fertility, North East India (NFHS-5, 2019-21 & Census 2011)

State	Female Literacy Rate % (Census 2011)	Women with 10+ Yrs Schooling % (NFHS-5)	Urban Population % (Census 2011)	Contraceptive Prevalence Rate % (NFHS-5)	Institutional Births % (NFHS-5)
Arunachal Pradesh	57.7	38.1	22.7	42.1	79.2
Assam	67.3	36.9	14.1	61.0	90.0
Manipur	70.3	46.2	32.5	49.6	79.9
Meghalaya	73.8	37.8	20.1	31.0	58.1
Mizoram	89.4	54.1	51.5	60.4	92.0
Nagaland	76.1	52.3	28.9	49.7	45.7
Sikkim	75.6	55.8	24.9	71.3	94.7
Tripura	83.1	46.7	26.2	65.6	90.9
All India	**65.5**	**41.0**	**31.2**	**66.7**	**88.6**

Note: Female literacy rates from Census of India 2011[5]. All NFHS-5 indicators from MoHFW/IIPS.[1, 3]

Table 2 reveals several important patterns. Mizoram, which has the highest female literacy in the region (89.4%) and the highest proportion of women with 10 or more years of schooling (54.1%),

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records a TFR of 1.9, well below replacement. Conversely, Meghalaya, despite a female literacy rate of 73.8% higher than Assam's 67.3% has the region's highest TFR (2.9). This irregularity is partly explained by Meghalaya's very low CPR of 31.0%, by far the lowest in the region and one of the lowest in all of India.[1], [9] In a matrilineal society where land inheritance rights and clan structures may incentivize larger family sizes, literacy alone appears insufficient to drive contraceptive adoption and fertility decline.

Contraceptive prevalence is strongly and inversely associated with fertility across the region. Sikkim (CPR 71.3%) and Tripura (CPR 65.6%) record the lowest TFRs among states with substantial populations, while Meghalaya's dismally low CPR of 31.0% corresponds directly with its persistently high fertility. The NFHS-5 finding that female sterilization is not the dominant contraceptive method in north-eastern states unlike in southern India is noteworthy.[3] A more diverse contraceptive method mix means that the region's family planning success depends on repeated contact with health services and sustained community outreach, rather than a single terminal event.

Institutional delivery rates track fairly well with both fertility and mortality outcomes. Nagaland's extraordinarily low institutional birth rate of 45.7% is directly implicated in its elevated child mortality indicators. Meghalaya's 58.1% rate is the second lowest in the region and consistent with its poor MMR and IMR numbers.[14] Sikkim (94.7%), Mizoram (92.0%), and Tripura (90.9%) — the three states with the best institutional delivery rates — also record some of the region's best mortality outcomes.

Nutritional Status and Child Mortality

Table 3: Nutritional Status and Child Health Indicators, North East India (NFHS-5, 2019-21)

State	Stunting % Children <5 Yrs	Wasting % Children <5 Yrs	Underweight % Children <5 Yrs	Anaemia % Women 15-49 Yrs
Arunachal Pradesh	28.6	17.5	19.5	46.0
Assam	35.3	21.7	28.8	65.9
Manipur	28.9	17.0	21.1	38.6
Meghalaya	46.5	16.2	28.4	50.0
Mizoram	28.9	6.1	11.9	33.8

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State	Stunting % Children <5 Yrs	Wasting % Children <5 Yrs	Underweight % Children <5 Yrs	Anaemia % Women 15-49 Yrs
Nagaland	32.7	19.1	22.7	28.8
Sikkim	22.3	14.4	14.2	40.3
Tripura	32.3	18.2	24.0	56.6
All India	**35.5**	**19.3**	**32.1**	**57.0**

Note: Stunting = low height-for-age; Wasting = low weight-for-height; Underweight = low weight-for-age, all for children under 5 years. Anaemia measured among women aged 15-49 years. All data from NFHS-5, [1,3,14]

Table 3 highlights the nutritional challenges that compound mortality risks across the region. Meghalaya records the highest stunting rate at 46.5%, worst in the entire country, reflecting chronic undernutrition entrenched across generations. Even in states with comparatively lower TFRs, nutrition data tells a worrying story: Assam's wasting rate of 21.7% exceeds the national average of 19.3%, and Tripura saw a significant increase in stunting between NFHS-4 and NFHS-5.[14]

Anaemia among women is particularly alarming. Assam records the highest anaemia rate in the region at 65.9%, against the national average of 57.0%. Given that anaemia is both a direct cause and a significant risk factor for maternal mortality, this figure may substantially explain the state's persistently elevated MMR.[3] Nagaland (28.8%) and Mizoram (33.8%) record far lower anaemia rates, consistent with better dietary diversity, higher household incomes, and different cultural food practices that include more protein-rich diets in these communities.

Sikkim, as with most other indicators, performs best in the region on nutrition: it records the lowest stunting (22.3%), wasting (14.4%), and underweight (14.2%) rates among all north-eastern states. Its IMR has declined the fastest from 26 per 1,000 live births in NFHS-4 to 12 in NFHS-5, a reduction of 53.8%.[14] Sikkim's performance reflects decades of investment in public health infrastructure, strong ASHA coverage, and its comparatively higher per capita income,

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Women's Empowerment and Family Planning Indicators

Table 4: Women's Empowerment and Family Planning Indicators, North East India (NFHS-5, 2019-21)

State	Child Marriage % Women 20-24 (NFHS-5)	Women Owning Mobile Phone %	Women with Bank Account %	Unmet Need for FP %
Arunachal Pradesh	20.4	56.3	81.4	13.5
Assam	31.8	52.7	78.5	11.0
Manipur	16.3	53.7	88.1	17.4
Meghalaya	20.2	47.1	74.6	21.0
Mizoram	8.2	76.0	90.7	14.1
Nagaland	13.4	59.2	64.4	15.6
Sikkim	9.5	72.2	89.8	10.2
Tripura	40.1	58.9	84.3	11.2
All India	**23.3**	**54.0**	**78.6**	**9.4**

Note: Child marriage = % of women aged 20-24 married before age 18. Unmet need for FP refers to married women not using contraception despite wishing to limit or space births. All data from NFHS-5[1,3]

Table 4 provides a composite view of women's empowerment indicators, each of which interacts with fertility and mortality outcomes through distinct pathways. Mobile phone ownership increasingly a proxy for social connectedness, access to health information and economic participation is highest in Mizoram (76.0%) and Sikkim (72.2%), the two states with the best overall demographic outcomes. Meghalaya (47.1%) and Assam (52.7%) lag considerably on this measure, consistent with their poorer demographic performances.[3]

Bank account ownership reflects financial inclusion and is closely associated with women's household decision-making power. Mizoram (90.7%), Sikkim (89.8%), and Manipur (88.1%) are near the top of the national distribution on this indicator, suggesting that women in these states enjoy stronger economic agency — which, over time, tends to reduce fertility and improve maternal healthcare-seeking behaviour.[1]

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Unmet need for family planning, the proportion of married women who wish to limit or space births but are not using contraception remains strikingly elevated in Meghalaya (21.0%) and Manipur (17.4%), precisely the two states with the highest TFRs in the region. This is a direct finding: closing the gap between desired and actual fertility through better access to contraceptive services could accelerate fertility transition in these states without requiring any fundamental shift in underlying fertility preferences.[1, 3]

Child marriage remains a serious structural problem. Tripura records the highest rate in the region at 40.1% of women aged 20-24 married before 18 higher than the national average of 23.3% and deeply concerning given its direct association with early pregnancy, reduced female education, and elevated maternal mortality risk.[16] Assam (31.8%) and Arunachal Pradesh (20.4%) also record elevated rates, and NFHS-5 data suggest that child marriage in parts of the north-east actually increased between NFHS-4 and NFHS-5, indicating that social norm change has not kept pace with other improvements.[3]

Trend Analysis Over NFHS Rounds

Table 5: Trend Analysis of TFR and IMR Across NFHS-3 (2005-06), NFHS-4 (2015-16), and NFHS-5 (2019-21)

State	TFR NFHS-3 (2005-06)	TFR NFHS-4 (2015-16)	TFR NFHS-5 (2019-21)	IMR NFHS-4 (per 1,000 LB)	IMR NFHS-5 (per 1,000 LB)	% Change IMR (NFHS-4 to NFHS-5)
Arunachal Pradesh	3.0	2.7	1.8	40	29	−27.5%
Assam	2.6	2.2	1.9	48	32	−33.3%
Manipur	3.0	2.6	2.2	21	30	+42.9%
Meghalaya	3.8	3.3	2.9	30	35	+16.7%
Mizoram	2.9	2.1	1.9	35	22	−37.1%
Nagaland	3.7	2.4	1.7	26	28	+7.7%
Sikkim	2.0	1.2	1.1	26	12	−53.8%
Tripura	2.3	1.7	1.7	27	25	−7.4%
All India	**2.7**	**2.2**	**2.0**	**41**	**35**	**−14.6%**

Note: LB = Live Births. TFR data for NFHS-3 from IIPS[17]; NFHS-4 from MoHFW[18]; NFHS-5 from MoHFW/IIPS[1, 3]. Positive % change values indicate deterioration in IMR.

Table 5 confirm that fertility decline has been universal and substantial across all eight north-eastern states over the 15-year period covered by three NFHS rounds. Nagaland shows the steepest TFR

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decline, from 3.7 in 2005-06 to 1.7 in 2019-21 — a fall of 2.0 children per woman in less than two decades. Arunachal Pradesh also achieved a remarkable decline from 3.0 to 1.8. Meghalaya, while still retaining the region's highest TFR, has reduced from 3.8 to 2.9 — a reduction of nearly a full child per woman over this period.[1, 17, 18]

The mortality trend, however, is a more complex picture. Sikkim's IMR improvement of 53.8% between NFHS-4 and NFHS-5 is extraordinary and represents one of the fastest infant mortality declines recorded anywhere in India during this period. Assam's 33.3% decline and Mizoram's 37.1% improvement reflect major public health investments including the Janani Suraksha Yojana (JSY) and Pradhan Mantri Suraksha Matritva Abhiyan (PMSMA) schemes.[4] However, three states Manipur (+42.9%), Meghalaya (+16.7%), and Nagaland (+7.7%) have recorded a worsening of IMR between NFHS-4 and NFHS-5. This reversal of progress in child survival, occurring even as fertility was declining in these very states, points directly to healthcare system failures as the proximate cause.

Discussion: Socio-Economic Determinants- An Integrated Analysis

The data reviewed across the five tables allow to identify four primary clusters of socio-economic determinants shaping fertility and mortality results in North East India.

Female Education and Autonomy- The educational pathway to lower fertility and better health outcomes is well established theoretically[7, 8] and broadly confirmed in this data. Mizoram and Sikkim, with the highest female educational attainment in the region, record the lowest fertility rates and the best mortality indicators. However, the Meghalaya paradox relatively high literacy but the region's highest TFR shows that education alone is not a sufficient condition for fertility reduction. In a matrilineal society where Christianity-influenced social norms coexist with high desired family size, literacy may have a weaker mediating effect on fertility preferences than in societies where women's education translates more directly into personal agency over reproductive decisions.[9, 10]

Contraceptive Access and Service Delivery- The very low CPR in Meghalaya (31.0%) and Manipur (49.6%), combined with very high unmet need for family planning in these states, represents a direct and actionable supply-side failure.[3]. The ASHA worker network, while expanded under the National Health Mission, has not reached adequate coverage in the hill districts of Meghalaya and Manipur. Improving last-mile delivery of reversible contraceptives, community-level counselling, and male participation in family planning must become the central levers of demographic policy in both states.[13]

Institutional Delivery and Maternal Health Infrastructure- The extremely low institutional delivery rate in Nagaland (45.7%) and Meghalaya (58.1%) is directly implicated in their high MMR

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estimates.[15] These states lack adequate numbers of functional 24x7 Primary Health Centres with skilled birth attendants and emergency obstetric care facilities reachable within an acceptable travel time. Given the mountainous terrain, simply building more physical facilities is insufficient: telemedicine-supported community birth centres staffed by trained nurse-midwives, combined with helicopter-based emergency referral systems, may be more contextually appropriate solutions than conventional urban hospital expansion.[14]

Poverty, Nutrition, and Structural Vulnerability- Poverty and undernutrition create a vicious cycle where malnourished mothers give birth to low-weight babies, who carry higher mortality risk and, if they survive, are more likely to experience stunting and wasting — perpetuating intergenerational cycles of disadvantage. Assam's high anaemia rate (65.9%) among women reflects dietary poverty, insufficient iron supplementation coverage and high infectious disease burden linked structurally to the state's large population of marginal agricultural workers living in flood-prone river valley areas.[6, 3] The NITI Aayog MPI 2021 found Assam to have the highest multidimensional poverty headcount in the north-east, encompassing deprivations in education, health, and standard of living simultaneously, which means that sectoral interventions however well designed, will have limited impact without concurrent poverty reduction.[6]

Urbanisation and the Rural-Urban Divide- Urbanisation is consistently associated with lower fertility in India as a whole (urban TFR 1.6 vs rural TFR 2.1 per NFHS-5).[1] In North East India, however, urbanisation rates are comparatively low: Assam (14.1%), Meghalaya (20.1%), and Arunachal Pradesh (22.7%) all fall well below the national urban population share of 31.2% (Census 2011). [5] Mizoram is the notable exception, with over half its population in urban areas which, combined with its high literacy and CPR, explains its completed fertility transition. The region's predominantly rural character means that rural outreach strategies, mobile health units, and community-based service delivery models must drive demographic progress here, not the urban demand-driven approaches that have worked in more urbanised states.

Conclusion

North East India sits at a consequential juncture in its demographic history. Fertility has declined substantially across all eight states over the past 15 years, with six of the eight states now recording TFRs at or below the national replacement level, a remarkable achievement given the region's geographic and logistical challenges. Yet the mortality story is far more troubling: maternal mortality remains dramatically elevated in Arunachal Pradesh, Manipur, and Meghalaya; infant mortality has worsened in Manipur, Meghalaya, and Nagaland even as fertility in these states has fallen.

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This paper highlighted that fertility decline is necessary but not sufficient for improving population health. The socioeconomic determinants of mortality which need to be improved are healthcare infrastructure access, institutional delivery, anaemia reduction, poverty improvement, and elimination of child marriage. Sikkim stands as proof that improvement is possible even within the constraints of being a small, mountainous, and historically resource-limited state. Its experience institutional delivery, high female educational attainment, strong contraceptive access, low poverty, and good nutritional outcomes represents the integrated demographic development model that the remaining north-eastern states must work toward.

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