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Demographic Dynamics: A Comprehensive Analysis Of Population Trends In Northeast India

Haripada Paul,
Assistant Professor, Department of Geography, Saheed Kshudiram College, Kamakhyaguri, West Bengal. Email: prof.hpaul@gmail.com

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Abstract: This study delves into the intricate demographic landscape of Northeast India, focusing on state-wise population dynamics, population growth rates, sex ratios, and child sex ratios. Through rigorous secondary data analysis, the research unveils compelling insights into the population trends of the region. By scrutinizing mortality rates, the study offers valuable perspectives for policymakers, enabling the formulation of targeted strategies to address the distinct demographic challenges prevalent in Northeast India.

Keywords: Demographic dynamics, Northeast India, population growth, mortality rates, policymakers.

Introduction

Northeast India, a region marked by its diverse ethnicities, cultures, and geographies, presents a compelling case for studying demographic dynamics. Despite its rich cultural heritage and ecological significance, the region grapples with complex demographic challenges that have significant implications for its socio-economic development. According to the Census of India (2011), Northeast India exhibited distinct demographic patterns compared to the national averages, highlighting the need for a nuanced understanding of its population dynamics (Census of India, 2011). The region's population growth rates, urbanization trends, and migration patterns deviate from the national norms, necessitating a focused inquiry into the underlying factors driving these trends (Ghose & Nath, 2020).

Migration stands out as a critical determinant shaping Northeast India's demographic landscape. Historically, the region has experienced substantial internal and international migration flows, driven by factors such as ethnic conflicts, economic disparities, and infrastructural developments (Baruah, 2004). The impact of migration on population distribution, composition, and socio-economic dynamics underscores its significance in demographic analyses of the region (Saikia & Bora, 2016).

In addition to migration, fertility and mortality rates play pivotal roles in shaping population dynamics in Northeast India. While fertility rates have shown a declining trend in recent years, regional variations and socio-cultural factors influence the pace and magnitude of this decline (Barman, 2018). Similarly, mortality rates, influenced by healthcare infrastructure, disease prevalence, and socio-economic factors, contribute to population changes in the region (Boruah et al., 2019).

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Objectives

The following objectives directly address the core aspects of the present study

1. To analyze state-wise population trends in Northeast India.
2. To calculate and compare population growth rates across states in Northeast India.
3. To examine the sex ratio and child sex ratio trends in Northeast Indian states.
4. To analyze infant mortality rate in Northeast Indian states.

Methodology

This study employs a secondary data analysis approach, utilizing population data collected from the Census of India to examine state-wise population trends, population growth rates, sex ratios, and child sex ratios in Northeast India. The data collection process involves accessing official reports published by the Census of India, which provide comprehensive information on population demographics for each state in the region. Additionally, demographic data from other relevant sources were consulted to complement the analysis. The collected data is organized systematically, allowing for comparison and calculation of population growth rates between 2001 and 2011, as well as assessment of sex ratios and child sex ratios for the year 2011. Statistical analysis techniques, including calculation of growth rates and sex ratios, are applied to the data, with descriptive statistics and graphical representations utilized to present the findings effectively

Result and Discussion

Population Size and Gender Distribution: The data from table 1 provided offers a fascinating glimpse into the demographic landscape of the North Eastern states of India. One notable observation is the variation in population size across these states, with Assam standing out as the most populous. However, it's intriguing to note that despite differences in total population, there's a semblance of consistency in the gender distribution patterns across most of these states.

Table 1: Population of NER with male –female number

State	Total Population (2011)	Male	Female
Arunachal Pradesh	1383727	713912	669815
Nagaland	1978502	1024649	953853
Manipur	2855794	1438586	1417208
Mizoram	1097206	555339	541867
Tripura	3673917	1874376	1799541
Meghalaya	2966889	1491832	1475057
Assam	31205576	15939443	15266133
Sikkim	610577	323070	287507

Source: Census of India (2011)

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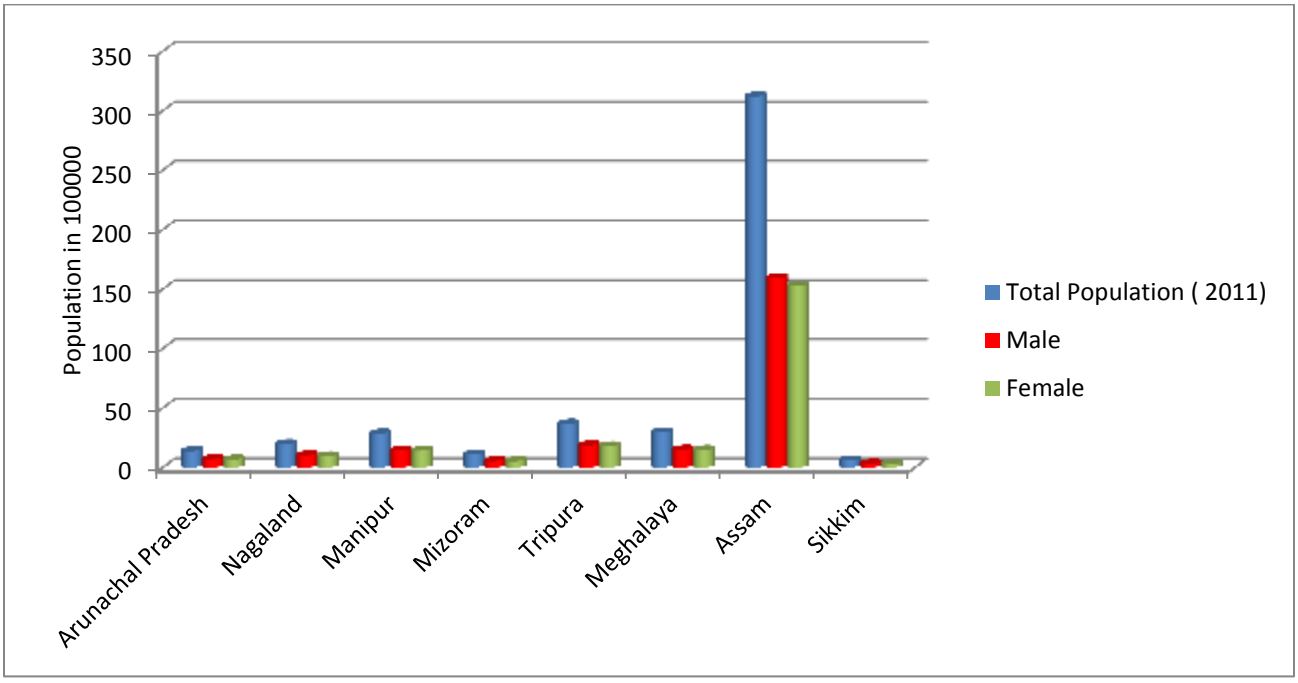
In terms of gender demographics, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura, Meghalaya, and Sikkim all exhibit a trend where the male population slightly outweighs the female population, albeit with varying degrees. This gender disparity, albeit slight, could be attributed to various factors such as migration patterns, socio-cultural dynamics, and historical trends within these regions.

Moreover, while Assam boasts the largest population overall, its gender distribution closely mirrors the national average, with a near-equal split between males and females. This could reflect a more balanced socio-economic environment or possibly differential migration patterns compared to the other states in the region. Understanding these demographic nuances is crucial for policymakers to tailor development initiatives and address any gender-specific challenges or disparities within the North Eastern states of India

Furthermore, the comparison of gender demographics between states allows for a nuanced understanding of regional variations within the North Eastern region. While some states exhibit a more pronounced gender gap, others demonstrate a closer parity between male and female populations. Exploring the reasons behind these differences can inform policy decisions aimed at fostering a more balanced and equitable society across the entire region.

Figure 1: State wise Male- Female and total population of NER



In summary, delving into the gender demographics alongside total population figures enriches our understanding of the North Eastern states' social fabric. By recognizing and addressing gender disparities, policymakers can work towards creating an environment that enables all

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individuals, regardless of gender, to thrive and contribute to the region's progress and development

Population Growth Rate: The population growth rate indicates the percentage change in the population of a region over a specific period, usually ten years between two census counts. It is calculated using the formula:

A positive growth rate indicates population increase, while a negative growth rate indicates a decrease. The population growth rate reflects the balance between births, deaths, and migration in a region. Arunachal Pradesh experienced a population growth rate of 26.0% between 2001 and 2011, indicating significant population expansion. This growth may be attributed to factors such as natural increase (births minus deaths) and migration. Nagaland witnessed a slight decrease in population (-0.6%) during the same period, which suggests a stagnation or slight decline in population growth. This could be due to factors such as low fertility rates, outmigration, or changes in socio-economic conditions.

Table 2: Growth rate of population of NER states

States	Total Population (2001)	Total Population (2011)	Population Growth Rate (%)
Arunachal Pradesh	1,097,968	1383727	26.0
Nagaland	1,990,036	1978502	-0.6
Manipur	2,293,896	2855794	24.5
Mizoram	888,573	1097206	23.5
Tripura	3,199,203	3673917	14.8
Meghalaya	2,318,822	2966889	27.9
Assam	26655528	31205576	16.9
Sikkim	540,851	610577	12.9

Source: Census of India, 2011

Manipur experienced a notable population growth rate of 24.5%, indicating rapid population expansion. Factors contributing to this growth may include high fertility rates, improved healthcare leading to lower mortality rates, and migration. Mizoram recorded a population growth rate of 23.5%, indicating substantial population growth. Possible factors driving this growth include natural increase and inward migration, possibly from neighboring states or countries.

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Tripura's population grew by 14.8% during the period, indicating moderate population expansion. Factors such as natural increase, improved healthcare, and government policies affecting migration may have influenced this growth. Meghalaya experienced a significant population growth rate of 27.9%, suggesting robust population expansion. Factors contributing to this growth may include high fertility rates, improved healthcare infrastructure, and inward migration. Assam witnessed a population growth rate of 16.9%, indicating moderate population expansion. This growth could be attributed to factors such as natural increase, relatively high fertility rates, and migration from other parts of India. Sikkim's population grew by 12.9% during the period, indicating moderate population expansion. This growth may be influenced by factors such as natural increase, migration for employment or educational opportunities, and government policies promoting development.

These population growth rates provide valuable insights into the demographic dynamics of each state and are essential for understanding trends in population distribution, resource allocation, and socio-economic development.

Mean Growth Rate: The mean growth rate, calculated as approximately 18.25%, represents the average rate of population growth across the Northeast India (NER) states included in the analysis.

This indicates that, on average, the population of these states grew by approximately 18.25% during the specified time period (from 2001 to 2011).

Standard Deviation: The standard deviation, calculated as approximately 9.00%, measures the variability or spread of the population growth rates around the mean.

A higher standard deviation suggests greater variability in growth rates among the states, while a lower standard deviation indicates more consistency in growth rates.

In this case, a standard deviation of approximately 9.00% implies moderate variability in population growth rates across the NER states analyzed.

Sex Ratio:

The sex ratio represents the number of females per 1,000 males in a given population. The mean sex ratio for the Northeast Indian states is calculated to be approximately 953.375, indicating that, on average, there are about 953 females for every 1,000 males in the region. The median sex ratio, which is 955.5, suggests that the majority of states have a sex ratio close to this value, indicating a balanced gender distribution or slight preference for females in some areas. A sex ratio below 1,000 indicates a higher proportion of males in the population, while a ratio above 1,000 suggests a higher proportion of females. In this context, the sex ratio values provided for the Northeast Indian states reflect the gender composition within the region.

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Table - 3 State-wise Sex Ration and Child Sex Ratio

State	Sex Ratio	Child Sex Ratio
Arunachal Pradesh	938	972
Assam	958	962
Manipur	985	930
Meghalaya	989	970
Mizoram	976	970
Nagaland	931	943
Sikkim	890	957
Tripura	959	960

Source: Census of India, 2011

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Child Sex Ratio: The child sex ratio specifically focuses on the ratio of girls to boys in the age group of 0-6 years. The mean child sex ratio for the Northeast Indian states from table 3 is calculated to be approximately 954.5, indicating that, on average, there are about 954 female children for every 1,000 male children in the region. The median child sex ratio, which is 961, suggests that the majority of states have a child sex ratio close to this value, indicating a relatively balanced gender distribution among children or a slight preference for female children in some areas. Monitoring the child sex ratio is crucial for assessing gender imbalances and potential discrimination against female children, particularly in terms of access to healthcare, nutrition, and education. The values provided for the Northeast Indian states offer insights into the gender dynamics within the younger population segment.

In summary, the sex ratio and child sex ratio measures provide valuable information about gender distribution and potential gender disparities within the population of Northeast India. These measures help policymakers and stakeholders understand gender dynamics, identify areas of concern, and design targeted interventions to promote gender equality and ensure the well-being of all individuals, regardless of gender, in the region.

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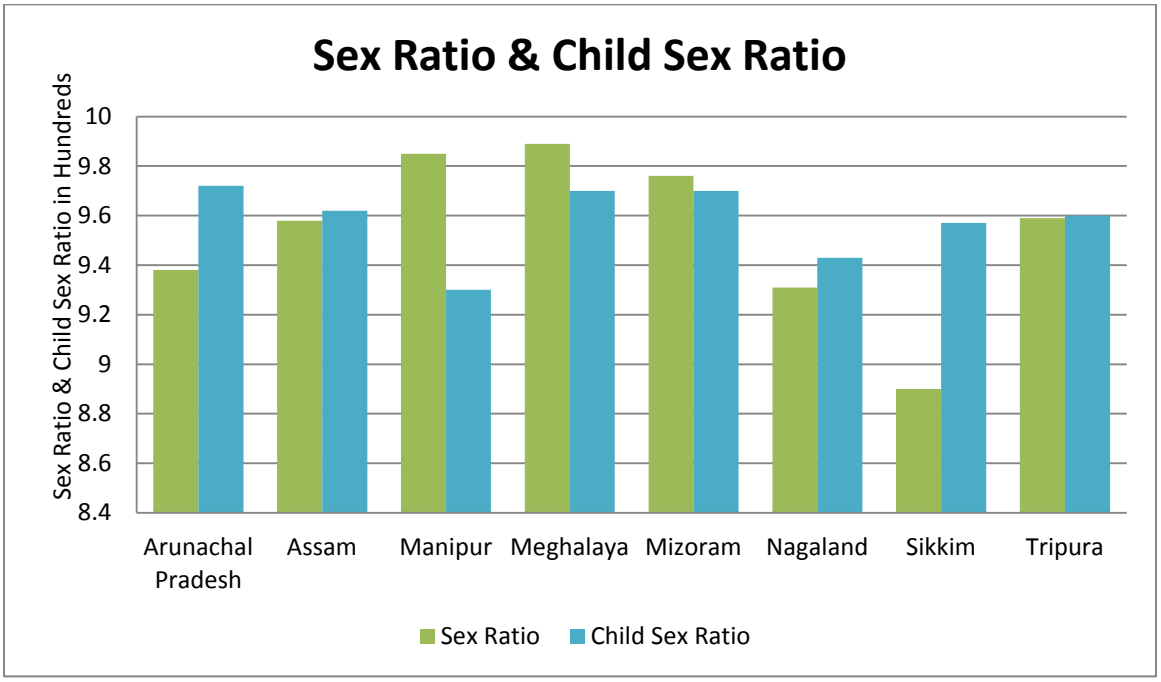
Figure 2: Sex Ratio and Child Sex Ratio NER States of India



The correlation coefficient (r) between the sex ratio and child sex ratio across the Northeast Indian states is approximately -0.054. This indicates a weak negative correlation between the overall gender distribution in the population and the gender distribution among children in these states.

Infant Mortality Rate (IMR): The table- 4 presents the Infant Mortality Rate (IMR) data for the states in the Northeastern Region (NER) of India across the years 2011 to 2016. The data spans from 2011 to 2016, providing a snapshot of the Infant Mortality Rates in these states over a five-year period.

Arunachal Pradesh has an IMR ranging from 30 to 36 during the period, with a slight increase in 2016 compared to 2015. Assam shows a gradual decline in IMR from 55 in 2011 to 44 in 2016, indicating improvements in infant health care over the years.

Manipur maintains a relatively low IMR throughout the period, fluctuating between 9 and 11 indicating good health care over the period. Meghalaya experiences a decreasing trend in IMR, with the rate dropping from 52 in 2011 to 39 in 2016. Mizoram starts with an IMR of 34 in 2011, declining to 27 in 2016, showcasing a consistent improvement. Nagaland exhibits a significant decrease in IMR from 21 in 2011 to 12 in 2015-2016, indicating notable progress. Sikkim shows a steady decline in IMR from 26 in 2011 to 16 in 2016, reflecting positive developments in infant health care. Tripura initially starts with an IMR of 29 in 2011, which decreases to 24 in 2016, indicating a downward trend.

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Table 4: State-wise Infant Mortality Rate of NER

State	2011	2012	2013	2015	2016
Arunachal Pradesh	32	33	32	30	36
Assam	55	55	54	47	44
Manipur	11	10	10	9	11
Meghalaya	52	49	47	42	39
Mizoram	34	35	35	32	27
Nagaland	21	18	18	12	12
Sikkim	26	24	22	18	16
Tripura	29	28	26	20	24
NER (Average)	33	31	30	26	25

Source: Sample Registration System, ORGI

The table-4 also provides the average IMR for the Northeastern Region (NER) as a whole, which ranges from 25 to 33 during the years covered. This average reflects the overall trend in infant mortality across the region.

Overall, the table indicates variations in infant mortality rates across different states in the Northeastern Region over the years, with some states showing improvements while others maintain relatively stable rates.

Findings: The demographic analysis of Northeast Indian states reveals diverse trends in population growth rates, gender demographics, and infant mortality rates. Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura exhibit downward trends in infant mortality rates, indicating advancements in healthcare. Assam stands out with a near-equal gender distribution mirroring the national average, suggesting balanced socio-economic environments or differential migration patterns. Population growth rates vary across states, with Arunachal Pradesh experiencing significant expansion, while Nagaland witnesses a slight decline. The mean sex ratio indicates a slightly higher proportion of males in the population, while the child sex ratio reflects relative gender balance among children. These findings underscore the need for tailored development initiatives to address regional disparities and promote equitable socio-economic progress across Northeast India.

Conclusion

The demographic landscape of the Northeast Indian states reveals varying trends in population growth rates, gender demographics, and infant mortality rates. While some states experience rapid population expansion, others face stagnation or slight declines. Gender distribution shows a slight preference for males in the overall population, with relatively balanced ratios among children. Improvements in infant mortality rates across most states reflect advancements in healthcare infrastructure and services. These findings underscore the importance of understanding regional demographic dynamics for effective policymaking and development

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initiatives tailored to address specific challenges and disparities within the Northeastern region of India.

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