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Demographic Dimensions of Elderly Population: A Case Study of Assam

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Abstract

Background: Population ageing has emerged as one of the most significant demographic challenges of the twenty-first century, resulting primarily from sustained declines in fertility and improvements in life expectancy. These changes have altered population age structures worldwide, leading to a growing proportion of elderly persons aged 60 years and above. While India continues to possess a large young population, the pace of ageing is accelerating rapidly. The elderly population, estimated at about 153 million in 2025, is projected to reach nearly 347 million by 2050, indicating a profound demographic transformation with far-reaching social, economic, and health implications. In Assam, the process of population ageing reflects broader demographic transitions, including declining fertility, reduced mortality, and selective out-migration of younger adults. Traditionally characterized by a youthful population structure, the state is now witnessing a steady increase in the proportion of older persons. This emerging trend necessitates a systematic examination of the demographic dimensions of ageing in Assam to inform policy formulation, social welfare planning, and sustainable development strategies.

Materials and Methods: The study employs a quantitative and descriptive research design based on secondary data sources. The elderly population is defined as individuals aged 60 years and above**.** To analyze the extent and pattern of population ageing in Assam, several demographic indicators are computed, including the Age–Sex Ratio**,** Old-Age Dependency Ratio (OADR)**,** Ageing Index**,** and Median Age. Descriptive statistical tools such as percentages and trend analysis are used to examine changes in population structure over time. The results are presented through tables to enhance clarity and comparative analysis.

Results: The analysis reveals a progressive increase in the proportion of the elderly population in Assam**,** indicating a clear shift toward an ageing demographic structure. The Old-Age Dependency Ratio has risen steadily, suggesting a growing dependency burden on the working-age population. Similarly, the Ageing Index indicates a significant increase in the elderly population relative to the child population. The age–sex composition of the elderly reveals a higher concentration of females in the older age groups, attributable to higher female life expectancy.

Conclusion: The study concludes that population ageing has emerged as an important demographic reality in Assam. Driven by declining fertility, improving healthcare facilities, and increasing life expectancy, the proportion and absolute number of elderly persons have increased substantially over the past six decades.

Keywords: ageing, demographic challenges, old-age dependency ratio, median age.

Introduction

Ageing is a complex and multifaceted issue. The United Nations Decade of Healthy Ageing (2021–2030) recognises that the impact of ageing extends far beyond health systems, encompassing labour and financial markets, social protection, education, and other societal dimensions. While ageing is a natural biological process experienced by all humans, concern for population ageing is relatively recent, arising primarily due to the substantial increase in the number and proportion of older persons (Goyel, 1989). Myers (1985) elaborates that ageing can be understood as a biological process, through which an organism undergoes gradual changes from birth to death. Similarly, individuals' psychological and social development, including social positions, roles, and status, can be examined in the context of ageing. However, population ageing is increasingly recognised as a significant societal force. The demographic increase in the elderly population often reflects broader societal development; as nations improve their socio-economic conditions, the proportion of older persons tends to rise. Changes in age structure associated with population ageing have profound implications for economic, political, and social systems. For instance, growing concerns have emerged about the long-term sustainability of intergenerational social support systems, which are critical for the well-being of both older and younger generations (U.N., 2001).

Objectives

The paper has the following objectives:

1. To examine the trends and patterns of population ageing in Assam using data from the Census of India and other demographic surveys.
2. To measure key ageing indicators including the Old-Age Dependency Ratio (OADR), Ageing Index, and Median Age to assess the extent and pace of ageing in the state.
3. To compare Assam's ageing profile with national trends to understand regional similarities and deviations in demographic transition.

Materials and Methods

The study employs a quantitative and descriptive research design based on secondary data sources. The elderly population is defined as individuals aged 60 years and above**.** To analyze the extent and pattern of population ageing in Assam, several demographic indicators are computed, including the Age–Sex Ratio**,** Old-Age Dependency Ratio (OADR)**,** Ageing Index**,** and Median Age. The data are analyzed using descriptive statistical methods, including percentages, ratios, and trend analysis. Temporal changes in the size and proportion of the elderly population are examined to understand the dynamics of population ageing. The results are presented in the form of tables to facilitate clarity, comparison, and interpretation. The present study adopts a quantitative, descriptive, and analytical research design to examine the demographic dimensions of the elderly population in Assam. The study is non-experimental in nature and is based entirely on the analysis of secondary demographic data. The study is conducted in the state of Assam, located in the north-eastern region of India. Assam is characterized by diverse geographical features, ethnic composition, and socio-economic conditions. Traditionally known for its relatively young population structure, the state has been undergoing significant demographic changes due to declining fertility rates, improving life expectancy, and selective out-migration of younger adults. These demographic transitions make Assam an important region for examining emerging patterns of

population ageing. The analysis covers the entire state and does not focus on any specific district or sub-region.

Discussion

Population ageing is increasing both in Assam and India, with a sharper rise after 2001 as shown in Table no.1. In India, the elderly population increased steadily from 5.6 per cent in 1961 to 10.7 per cent in 2021, indicating a clear trend of population ageing whereas in Assam**,** the percentage rose from 4.3 per cent in 1961 to 9.1 per cent in 2021, showing a similar upward trend, especially after 2001.Throughout the period, India's elderly population remained higher than Assam's, but both show rapid growth in recent decades. This increase is mainly due to improved healthcare, rising life expectancy, and declining birth rates**.**

Table 1: Percentage of Elderly Population

Year	Assam	India
1961	4.3	5.6
1971	4.7	6
1981	na	6.3
1991	5.3	6.6
2001	5.2	6.9
2011	6.5	8.3
2021	9.1	10.7

Source: Demographics of Population Ageing in India, 2011.

Table 2: Distribution of Elderly by age- group

Age- group	Region	2001	2011	2021
60-69	Assam	3.5	4.0	5.7
	India	4.5	4.8	6.3
70-79	Assam	1.5	2.0	2.5
	India	2.1	2.7	3.1
80+	Assam	0.2	0.5	0.9
	India	0.3	0.8	1.2
Total	Assam	5.2	6.5	9.1
	India	6.9	8.3	10.6

Source: Demographics of Population Ageing in India, 2011.

The above Table reflects the distribution of elderly population by age- group (60–69, 70–79 and 80+) in Assam and India for the years 2001to 2021**.** It clearly highlights the rising trend of population ageing over time with growth across all elderly age groups, especially among the oldest-old, emphasizing the need for stronger healthcare and social support systems for the elderly. Both in Assam and India, the 60–69 age- group forms the largest share of the elderly population. In Assam, this group increased from 3.5 per cent in 2001 to 5.7 per cent in 2021, while in India it rose from 4.5 per cent to 6.3 per cent during the same period. This indicates improved life expectancy and a growing number of people entering old age. The 70–79 age- group also shows a steady increase. In Assam, it grew from 1.5 per cent in 2001 to 2.5

per cent in 2021, whereas in India it increased from 2.1 per cent to 3.1 per cent**.** Although smaller than the 60–69 group, this age group reflects a gradual survival into advanced ages. The 80 years and above population, though the smallest, shows the fastest relative growth. In Assam, it rose from 0.2 per cent in 2001 to 0.9 per cent in 2021, while in India it increased from 0.3 per cent to 1.2 per cent**.** This suggests better healthcare and declining mortality at higher ages. Overall, the total elderly population increased significantly from 5.2 per cent to 9.1 per cent in Assam and from 6.9 per cent to 10.6 per cent in India between 2001 and 2021. India consistently shows a higher proportion of elderly than Assam, but both follow a similar ageing pattern.

Table 3: Sex- ratio of the Elderly in different age- group

Age-group	Region	1961	1971	1981	1991	2001	2011	2021
60-69	**Assam**	76	75	na	81	92	95	93
	India	100	94	96	94	102	105	103
70-79	**Assam**	78	76	na	76	83	106	104
	India	106	97	98	93	99	114	113

Source: Demographics of Population Ageing in India, 2011.

The feminisation of the elderly is indicated by the growing number of women in older ages compared to men and is an important concern for policy relevant research. Table no. 3 presents the sex- ratio of the elderly population (number of females per 100 males) in the 60–69 and 70–79 age- groups for Assam and India from 1961 to 2021. It helps in understanding gender balance among the elderly over time. In Assam, the sex- ratio in the 60–69 age- group remained low and male-dominated in the early decades, declining from 76 in 1961 to 75 in 1971. Data for 1981 is not available. From 1991 onwards, there is a steady improvement, rising to 81 in 1991**,** 92 in 2001, and reaching 95 in 2011 but slightly declining to 93 in 2021. This indicates increasing female survival in later years, though males still outnumber females whereas in India, the sex- ratio is comparatively higher and more balanced. It declined from 100 in 1961 to 94 in 1971, but gradually improved thereafter. From 102 in 2001, it increased to 105 in 2011, and slightly declined to 103 in 2021, showing a female advantage in this age group at the national level. In the 70–79 age- group, Assam again shows a low sex- ratio in earlier decades, falling from 78 in 1961 to 76 in 1971 (1981 data not available). By 2001, it improved modestly to 83, followed by a sharp increase to 106 in 2011, and a slight decline to 104 in 2021. This shift suggests better female longevity at older ages in recent decades. For India, the sex- ratio in this age- group has generally remained higher than Assam. It declined from 106 in 1961 to 93 in 1991, but then increased significantly to 99 in 2001**,** 114 in 2011and 113 in 2021. This clearly reflects greater female survival at advanced ages at the national level.

Table 4: Distribution of Elderly population by marital status and sex

Age-group	Region	Never Married		Married		Widowed		Divorced/ Separated	
		M	F	M	F	M	F	M	F
60-69	**Assam**	1.8	1.7	85.2	40.8	12.6	56.9	0.4	0.6
	India	2.6	1.5	82.1	47.3	15.0	50.7	0.3	0.5

70-79	**Assam**	3.4	3.2	73.3	24.6	22.8	71.7	0.5	0.5
	India	5.4	3.5	65.3	25.1	28.9	71.0	0.4	0.4

Source: Demographics of Population Ageing in India, 2011.

A perusal of the above Table shows the distribution of elderly population by marital status and sex for two age groups 60–69 years and 70–79 years in Assam and India**.** It highlights clear gender differences in marital status among the elderly**,** especially widowhood.

Age Group 60–69 Years: In Assam, the majority of elderly men (85.2 per cent) are married, compared to only 40.8 per cent of women. Widowhood is much higher among women (56.9 per cent) than men (12.6 per cent), indicating higher male mortality and age differences between spouses. The proportion of never-married elderly is very small for both males and females, while divorced/separated persons form a negligible share. At the all-India level, a similar pattern is observed. About 82.1 per cent of men are married compared to 47.3 per cent of women. Widowhood is again significantly higher among women (50.7 per cent) than men (15.0 per cent). Never-married and divorced/separated elderly constitute a very small proportion.

Age Group 70–79 Years: In the 70–79 age group, marriage declines sharply, especially for women. In Assam**,** 73.3 per cent of men are still married, but only 24.6 per cent of women remain married. Widowhood becomes dominant among elderly women, rising to 71.7 per cent**,** while it increases to 22.8 per cent among men**.** In India, the trend is similar but more pronounced. Only 25.1 per cent of women are married, while widowhood rises to 71.0 per cent**.** Among men, 65.3 per cent remain married and 28.9 per cent are widowed. The proportion of never-married elderly increases slightly with age but remains relatively low.

Table 5: Trends in proportion (per cent) of Elderly by sex & place of residence (urban / rural)

Place of residence	**Region**	**1961**		**1971**		**1981**		**1991**		**2001**	
		M	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**
Rural	**Assam**	4.7	4.0	5.2	4.3	na	na	5.8	5.0	5.8	5.9
	India	5.7	6.0	6.3	6.2	7.6	6.9	7.2	7.0	7.4	8.1
Urban	**Assam**	3.2	3.8	4.0	4.2	na	na	5.0	5.0	5.7	5.9
	India	4.4	5.1	4.7	5.3	5.1	5.7	5.6	6.0	6.3	7.2

Source: Demographics of Population Ageing in India, 2011.

The above Table reflects the trends in the proportion of elderly population (60 years and above) by sex (male and female) and place of residence (rural and urban) for Assam and India from 1961 to 2001**.** It highlights differences across time, gender, and rural–urban locations. In rural Assam, the proportion of elderly males increased from 4.7 per cent in 1961 to 5.8 per cent in 2001, while elderly females rose from 4.0 per cent to 5.9 per cent during the same period. Although data for 1981 is not available, the overall trend shows a gradual rise, with female proportions catching up with and slightly surpassing males by 2001. This suggests improving female longevity in rural areas. In rural India, the elderly population shows a steady and stronger increase compared to Assam. Elderly males increased from 5.7 per cent in 1961 to 7.4 per cent in 2001, while females rose from 6.0 per cent to 8.1 per cent. From 1981

onwards, the proportion of elderly females consistently remained higher than males, reflecting higher life expectancy among women at the national level. In urban Assam, the proportion of elderly males increased from 3.2 per cent in 1961 to 5.7 per cent in 2001, while females increased from 3.8 per cent to 5.9 per cent. The gender gap narrowed over time, and by 2001, the proportion of elderly males and females became almost equal, indicating balanced ageing in urban areas. In urban India, the trend is similar but at a higher level. Elderly males increased from 4.4 per cent in 1961 to 6.3 per cent in 2001 and females from 5.1 per cent to 7.2 per cent. Throughout the period, **urban females consistently** outnumbered males, highlighting better female survival and access to healthcare in urban settings.
The above Table highlighted that rural areas have a higher proportion of elderly than urban areas in both Assam and India. India shows a higher proportion of elderly than Assam across all years and both residences. Moreover, the female share of the elderly increases, especially in both urban and rural India.

Table 6: Trends in the Median Age (Years) of the Population in Assam

Region	1961	1971	1981	1991	2001	2011	2021
Assam	19.6	17.9	na	20.4	21.3	24.5	28.6
India	20.5	19.6	20.2	21.6	22.5	25.5	29.3

Source: Demographics of Population Ageing in India, 2011.

The Table shows the changes in median age (in years) of the population in Assam and India from 1961 to 2021. Median age is an important indicator of the age structure and level of population ageing. In Assam, the median age was 19.6 years in 1961, which declined to 17.9 years in 1971, indicating a younger population during this period due to high fertility. From 1991 onwards, the median age shows a steady increase, rising from 20.4 years in 1991 to 21.3 years in 2001, 24.5 years in 2011and reaching 28.6 years in 2021. This sharp rise reflects declining fertility, improved survival rates, and increasing life expectancy, leading to population ageing. Whereas at the national level, India follows a similar trend but with a consistently higher median age than Assam. India's median age increased from 20.5 years in 1961 to 29.3 years in 2021, showing a continuous ageing of the population over six decades. Comparatively, Assam had a lower median age than India throughout the period, suggesting that Assam's population remained relatively younger. However, the gap between Assam and India has narrowed over time, especially after 2001, indicating that Assam is also undergoing a rapid demographic transition.

Table 7: Trends in the Index of Ageing for Assam

Region	1961	1971	1981	1991	2001	2011	2021
Assam	9.6	10.1	na	13.6	13.9	21.6	35.1
India	13.7	14.0	15.0	17.6	19.4	28.4	42.5

Source: Demographics of Population Ageing in India, 2011.

The index of ageing is the shift in the balance between the child and older populations and is expressed as the number of persons above 60 years for every 100 children below the age of 15 years. Table 1.7 presents the Index of Ageing for Assam and India from 1961 to 2021. The Index of Ageing measures the number of elderly persons (60 years and above) per 100 children (0–14 years) and is a key indicator of population ageing. In Assam, the Index of Ageing was very low in the early decades, standing at 9.6 in 1961 and 10.1 in 1971, indicating a predominantly young population. Data for 1981 is not available. By

1991, the index increased to 13.6**,** and further to 13.9 in 2001, showing the beginning of demographic ageing. A sharp rise is observed thereafter, with the index increasing to 21.6 in 2011 and reaching 35.1 in 2021. This rapid increase reflects declining fertility rates and a growing elderly population in recent decades. At the all-India level, the Index of Ageing has consistently been higher than that of Assam throughout the period. It increased steadily from 13.7 in 1961 to 42.5 in 2021, indicating a more advanced stage of population ageing at the national level. Comparatively, although Assam's Index of Ageing remains lower than India's, the gap has narrowed over time, particularly after 2001. This suggests that Assam is experiencing a faster pace of ageing in recent years.

Table 8: Dependency ratios (per cent), Assam

Age-group	Region	1961	1971	1981	1991	2001	2011	2021
Young (0- 14)	**Assam**	88.1	96.8	na	69.7	65.3	47.3	39.6
	India	76.6	81.6	74.0	67.0	61.4	46.4	39.2
Old (60+)	**Assam**	8.4	9.7	na	9.5	9.1	10.2	13.9
	India	10.5	11.5	11.6	11.8	11.9	13.2	16.7
Total	**Assam**	96.5	106.5	na	79.2	74.4	57.5	53.5
	India	87.1	93.1	85.6	78.7	73.4	59.6	55.9

Source: Demographics of Population Ageing in India, 2011.

The ratio of the dependent population to that of the working age population is defined as the dependency ratio and is an important indicator of the economic burden carried by each worker. The young age dependency ratio reflects the dependency burden from children below 15 years of age. Similarly, old age dependency is the ratio of persons aged 60 years and above to the working age population. The Table shows young, old, and total dependency ratios for Assam, with a comparison to India, from 1961 to 2021. Dependency ratio indicates the burden on the working-age population (15–59 years) to support dependents.

Young- Age Dependency Ratio (0–14 Years)- In **Assam**, the young dependency ratio was **very high in the early decades**, increasing from **88.1 per cent in 1961 to 96.8 per cent in 1971**, reflecting **high fertility and a large child population**. Data for 1981 is not available. From **1991 onwards**, there is a **continuous decline**, falling from **69.7 per cent in 1991** to **65.3 per cent in 2001**, **47.3 per cent in 2011**, and further to **39.6 per cent in 2021**. This sharp decline indicates **reduced fertility and a shrinking child population**. At the national level, **India also shows a similar declining trend**, though Assam's young dependency ratio was higher than India's in the earlier decades. By 2021, both Assam (**39.6 per cent**) and India (**39.2 per cent**) show almost identical values.

Old- Age Dependency Ratio (60+ Years)- The **old age dependency ratio** in **Assam** was relatively low, rising slowly from **8.4 per cent in 1961** to **9.7 per cent in 1971**. After 1991, it shows a **gradual but steady increase**, reaching **9.1 per cent in 2001**, **10.2 per cent in 2011**, and **13.9per cent in 2021**. This reflects the **growing elderly population** in the state. In **India**, the old dependency ratio has been

consistently higher than in Assam, increasing from **10.5 per cent in 1961** to **16.7 per cent in 2021**, indicating more advanced population ageing at the national level.

Total Dependency Ratio- The total dependency ratio in Assam was extremely high in the earlier period, peaking at 106.5 per cent in 1971, meaning more dependents than working-age population. From 1991 onwards, it declined sharply to 79.2 per cent, 74.4 per cent in 2001, 57.5 per cent in 2011, and 53.5 per cent in 2021. This decline is mainly due to the reduction in young dependents. India shows a similar downward trend, though its total dependency ratio remained slightly higher than Assam's in recent decades.

Key Findings

1. **Steady Increase in Elderly Population-** The proportion of elderly population (60 years and above) in Assam has increased consistently from 4.3 per cent in 1961 to 9.1 per cent in 2021. Although Assam's elderly share remains lower than the national average, the pace of ageing has accelerated sharply after 2001.
2. **Growth across All Elderly Age- Groups**- All elderly age groups 60–69, 70–79, and 80+ have shown significant growth. The most rapid relative increase is observed among the oldest-old (80+), indicating improved survival rates and increased longevity.
3. **Emerging Feminisation of ageing**- The sex- ratio among the elderly has improved over time, especially in higher age groups, reflecting greater female longevity. Widowhood is disproportionately higher among elderly women, making them more socially and economically vulnerable.
4. **Rural Concentration of Elderly Population**- Rural areas in Assam contain a higher proportion of elderly population compared to urban areas. However, urban ageing is also rising, suggesting the need for both rural and urban ageing-focused interventions.
5. **Rising Median Age and Index of Ageing**- The median age of Assam has increased significantly, from 19.6 years in 1961 to 28.6 years in 2021. Similarly, the Index of Ageing has risen sharply, indicating a declining child population relative to the elderly and a shift towards an ageing population structure.
6. **Changing Dependency Structure**- While the total dependency ratio has declined due to falling child dependency, the old-age dependency ratio has increased steadily. This shift signals a growing economic and social burden on the working-age population.
7. **Assam in a Rapid Demographic Transition Phase**- Although Assam remains demographically younger than India as a whole, the narrowing gap between the state and national ageing indicators suggests that Assam is undergoing a rapid demographic transition and must prepare for future ageing challenges.

Conclusion

The study clearly establishes that population ageing has emerged as an important demographic reality in Assam. Driven by declining fertility, improving healthcare facilities, and increasing life expectancy, the proportion and absolute number of elderly persons have increased substantially over the past six decades. The ageing process in Assam, though less advanced than the national level, has gained momentum in recent decades, particularly after 2001. The changing age structure, rising median age, increasing index of ageing, and growing old-age dependency ratio indicate that Assam is moving

towards an ageing society. The feminisation of ageing, high levels of widowhood among elderly women, and the predominance of elderly population in rural areas highlight significant social and economic vulnerabilities. These demographic shifts have far-reaching implications for healthcare, social security, family support systems, and labour markets. If appropriate measures are not adopted in time, population ageing may place considerable strain on the state's socio-economic development. Therefore, population ageing must be integrated into development planning to ensure healthy, active, and dignified ageing for the elderly population of Assam.

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