

Ageing in Assam: A Study of Spatial Distribution and Gender Disparities

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Abstract: Population ageing has emerged as an important demographic phenomenon in India, reflecting improvements in life expectancy and changes in fertility patterns. This study examines the spatial distribution and gender disparities of the ageing population in Assam at the district level using data from the Census of India 2011. The elderly population is categorized into three age groups: Younger Old (60–69 years), Old-Old (70–79 years), and Oldest-Old (80 years and above). The study aims to analyse regional variations in the ageing population, identify gender differences across age groups, and examine rural–urban disparities among districts. The analysis is based on secondary data and employs descriptive statistical methods, including percentage and comparative analysis. The findings of the study will underline the importance of region-specific policies and social support systems for the growing elderly population in the state.

Keywords: demographic, ageing, disparities, gender, oldest-old.

Introduction

Population ageing is an emerging demographic phenomenon in India, driven by declining fertility and mortality rates and improvements in life expectancy. Assam, the largest state in North-East India, has been experiencing gradual demographic changes, including increasing life expectancy and changing fertility patterns, which contribute to the growth of the elderly population. In Assam, the distribution of the elderly population varies significantly across districts due to differences in socio-economic development, healthcare access, fertility, and migration patterns. Gender disparities are also evident, with females generally outliving males, especially in the oldest-old (80+) category. This study provides a district-level analysis of the spatial distribution and gender differences among the elderly in Assam, highlighting rural–urban and regional variations to inform targeted social and healthcare policies.

Literature Review

Several studies have examined the emerging issue of population ageing in India and its regional variations. United Nations Population Fund's *India Ageing Report 2023* highlights that increasing life expectancy and declining fertility are major drivers of the growing elderly population in the country. At the national level, the *Longitudinal Ageing Study in India (LASI)* conducted by the International Institute for Population Sciences provides comprehensive insights into health, economic, and social aspects of ageing in India. Recent studies such as S. I. Madiwalappagol (2025) further emphasize that population ageing is becoming an important demographic concern requiring improved healthcare services and social support systems.

Studies such as Anima Baruah (2015) review the socio-economic and demographic aspects of ageing in North-East India and emphasize the need for region-specific policy responses. Similarly, P. Neog (2016) provides an overview of ageing patterns in India with special reference to Assam and notes the gradual increase of elderly population in the state. Moreover, she analysed various socio-economic aspects of population ageing in India.

Research by Rumi Devi (2019) highlights spatial and temporal variations in population ageing within districts of Assam, particularly focusing on urban areas such as Kamrup Metropolitan. Earlier work by A. K. Dutta (2002) examined the socio-demographic characteristics of elderly populations in Assam and identified variations in social and economic conditions affecting their well-being. These studies collectively highlight the growing importance of ageing research in India. However, there remains a need for detailed district-level analysis of spatial distribution and gender disparities in the elderly population of Assam, which the present study attempts to address.

Objectives

1. To examine the spatial distribution of the ageing population across districts of Assam.
2. To analyze gender differences in the distribution of elderly population across different age groups (60-69, 70-79, and 80+ years).
3. To identify rural-urban disparities in the gender composition of the elderly population in Assam.

Materials & Methods

Data Source

The study is based on secondary data obtained from the 2011 Population Census of India. District-level data relating to the elderly population (60 years and above) were collected for all districts of Assam.

Methods of Analysis

The study adopts descriptive and comparative statistical techniques.

1. Percentage Analysis is used to calculate the proportion of elderly population to the total population and to examine male–female distribution.
 2. District-Level Comparative Analysis is used to make comparison of ageing patterns across districts.
 3. Rural–Urban Analysis is used to separate examination of rural and urban gender composition of the elderly population.
 4. Regional Interpretation for identification of regional patterns such as Upper Assam, Lower Assam, Barak Valley, and Hill districts.
 5. Location Quotient (LQ) is used to measure the relative concentration of elderly population in a district compared to the state average. It helps to identify districts with higher or lower concentration of elderly population.
- $LQ > 1$ indicates higher concentration than the state average.
 - $LQ = 1$ indicates equal concentration.
 - $LQ < 1$ indicates lower concentration than the state average.

$$\text{Formula: } LQ = (E_d/P_d) / (E_s/P_s)$$

Where:

E_d = Elderly population of district

P_d = Total population of district

E_s = Elderly population of state

P_s = Total population of state

Result & Discussion

Distribution of the elderly population in Assam

Table 1.1 presents the district-wise distribution of the elderly population in Assam, highlighting the proportions of the younger-old (60–69 years), old-old (70–79 years), and oldest-old (80+ years) categories, as well as the percentage of the total ageing population relative to the district population.

Table 1.1
Spatial distribution of ageing population in Assam, 2011

Sl. No.	District	Younger Old	Old-Old	Oldest-Old	Total Ageing Population	Total Population	Percentage of Ageing Population to Total Population
1.	Kokrajhar	32558	15391	6337	54286	887142	6
2.	Dhubri	66050	32194	14454	112698	1949258	6
3.	Goalpara	34824	16225	6884	57933	1008183	6
4.	Barpeta	63931	31750	14209	109890	1693622	6
5.	Morigaon	36662	17248	8072	61982	957423	6
6.	Nagaon	113790	53176	24218	191184	2823768	7
7.	Sonitpur	82180	35076	13571	130827	1924110	7
8.	Lakhimpur	42747	18952	7384	69083	1042137	7
9.	Dhemaji	26114	11763	4303	42180	686133	6
10.	Tinsukia	53843	22530	8292	84665	1327929	6
11.	Dibrugarh	57386	23310	8772	89468	1326335	7
12.	Sivasagar	54200	22850	8196	85246	1151050	7
13.	Jorhat	56244	23161	8503	87908	1092256	8
14.	Golaghat	47615	19201	7027	73843	1066888	7
15.	Karbi Anglong	30557	13460	5936	49953	956313	5
16.	Dima Hasao	7013	3039	1240	11292	214102	5
17.	Cachar	75455	32974	13276	121705	1736617	7
18.	Karimganj	51727	23804	10697	86228	1228686	7
19.	Hailakandi	27025	11455	4510	42990	659296	7
20.	Bongaigaon	27674	13415	5497	46586	738804	6
21.	Chirang	17650	7984	3491	29125	482162	6
22.	Kamrup	68148	29570	11419	109137	1517542	7
23.	Kamrup Metropolitan	56179	22882	8556	87617	1253938	7
24.	Nalbari	38859	18273	5853	62985	771639	8
25.	Baksa	41312	18312	6781	66405	950075	7
26.	Darrang	36154	17086	6698	59938	928500	6
27.	Udalguri	33443	14548	5399	53390	831668	6
	Assam	1279340	569629	229575	2078544	31205576	7

Source: Census of India 2011.

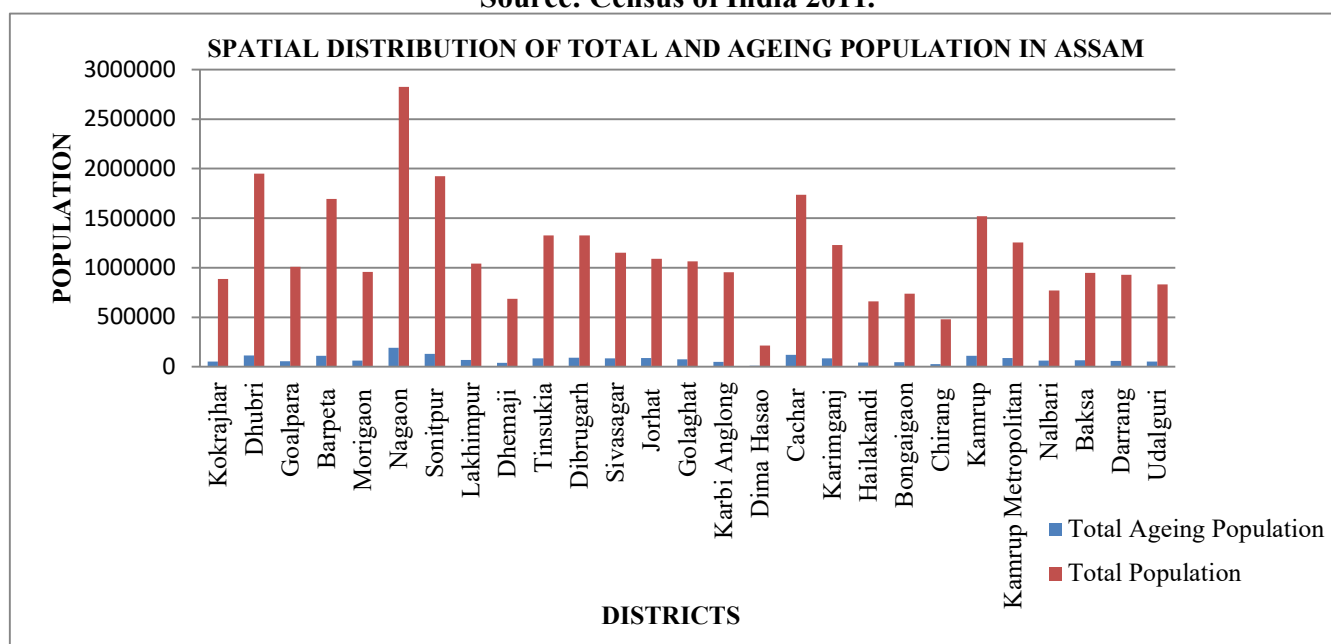


Figure 1 Showing district-wise total and ageing population in Assam

The above Table reveals that the majority of elderly belong to the 60–69 age group (Younger Old), accounting for more than half of the total elderly population. The relatively smaller proportion of the “Oldest-Old” (80+) suggests that advanced ageing is still limited in the state. This indicates that Assam is in a moderate stage of demographic ageing, compared to more advanced states of India. Jorhat and Nalbari districts exhibit the highest proportion (8 percent) of elderly population in the state as they reflect a relatively advanced demographic transition. The relatively higher ageing levels may be attributed to better healthcare infrastructure, higher literacy rates, lower fertility levels and out-migration of younger population.

Several districts namely Nagaon, Sonitpur, Dibrugarh, Sivasagar, Golaghat, Cachar, Karimganj, Kamrup, Kamrup Metropolitan, Baksa and Hailakandi fall within the state average (7 percent) or slightly above. These districts demonstrate relatively balanced demographic structures, where both fertility decline and improvement in survival rates contribute to ageing. Notably, Nagaon records the highest absolute number of elderly persons (1,91,184), primarily due to its large total population base.

Districts such as Dhubri, Barpeta, Goalpara, Kokrajhar, Bongaigaon, Chirang, Darrang, Udalguri, Morigaon, Dhemaji and Tinsukia have relatively younger age structures (6 percent). Higher fertility rates and larger household sizes contribute to maintaining a lower proportion of elderly population.

The hill districts Karbi Anglong and Dima Hasao show the lowest percentage (5 percent) of ageing population. These areas are still in the early phase of demographic transition. The factors that contribute to this phase may include higher fertility rates, lower life expectancy and limited access to advanced healthcare.

Regional Trends

Upper Assam: Districts such as Jorhat, Dibrugarh, and Sivasagar show relatively higher ageing levels. These districts are socio-economically better developed and exhibit lower fertility and better health facilities, resulting in higher life expectancy.

Lower (Western) Assam: Most western districts maintain around 6percent elderly population. Higher fertility rates and a relatively younger demographic base contribute to lower ageing levels.

Barak Valley: Cachar, Karimganj, and Hailakandi show moderate ageing (7percent). Urban influence (Silchar) and improved health services support higher survival rates.

Hill Districts: Karbi Anglong and Dima Hasao display the lowest ageing proportion, reflecting a younger population composition.

The Location Quotient is used to show the spatial concentration of elderly population in the district.

Table 1.2
Spatial concentration of elderly population in Assam, 2011

Age-Group	Location Quotient (LQ) value		
	High (>1)	Moderate (=1)	Low (<1)
60- 69	Nagaon, Sonitpur, Lakhimpur, Tinsukia, Dibrugarh, Sivasagar, Jorhat, Golaghat, Cachar, Karimganj, Hailakandi, Kamrup, Kamrup (M), Nalbari, Baksa, Udalguri	Kokrajhar, Barpeta, Morigaon, Dhemaji, Bongaigaon, Chirang, Darrang	Dhubri, Goalpara, Karbi Anglong, Dima Hasao
70- 79	Jorhat, Nalbari	Barpeta, Morigaon, Nagaon, Sonitpur, Lakhimpur, Sivasagar, Cachar, Karimganj, Bongaigaon, Kamrup, Kamrup (M), Baksa, Darrang	Kokrajhar, Dhubri, Goalpara, Tinsukia, Dhemaji, Lakhimpur, Dibrugarh, Golaghat, Karbi Anglong, Dima Hasao, Hailakandi, Chirang, Udalguri
80+	-	-	Kokrajhar, Dhubri, Goalpara, Barpeta, Morigaon, Nagaon, Sonitpur, Lakhimpur, Dhemaji, Tinsukia, Dibrugarh, Sivasagar, Jorhat, Golaghat, Karbi Anglong, Dima Hasao, Cachar, Karimganj, Hailakandi, Bongaigaon, Chirang, Kamrup, Kamrup (M), Nalbari, Baksa, Darrang, Udalguri

Source: Computed by the author based on data from Census of India 2011.

A perusal of the above Table reveals that for the 60–69 age group, a large number of districts such as Nagaon, Sonitpur, Lakhimpur, Tinsukia, Dibrugarh, Sivasagar, Jorhat, Golaghat, Cachar, Karimganj, Hailakandi, Kamrup, Kamrup (M), Nalbari, Baksa, and Udalguri show high LQ values, indicating a higher concentration of people in the early elderly stage. Districts like Kokrajhar, Barpeta, Morigaon, Dhemaji, Bongaigaon, Chirang, and Darrang show moderate concentration, while Dhubri, Goalpara, Karbi Anglong, and Dima Hasao fall under low concentration.

In the 70–79 age group, only Jorhat and Nalbari show high concentration, indicating that these districts have a relatively larger share of the older elderly population. Several districts fall under the moderate category, while many others show low concentration, suggesting that the proportion of elderly people decreases as age increases.

For the 80 years and above age group, all districts fall under the low concentration category, and no district records moderate or high LQ values. This indicates that the very old population (80+) is relatively small and widely dispersed across the state.

Overall, the table shows that the spatial concentration of the elderly population is higher in the 60–69 age group, while the concentration gradually declines in the higher age groups. This suggests that Assam is experiencing the initial stages of population ageing, with relatively fewer people surviving into the advanced elderly age groups.

Gender composition of the elderly population

Table 1.3 illustrates the gender composition of the elderly population across districts, showing male and female shares within the younger-old, old-old, and oldest-old age groups, and highlighting gender disparities across different stages of ageing.

Table 1.3

Male- female differences in percentage distribution of ageing population in Assam, 2011

Sl. No.	District	Younger Old		Old- Old		Oldest- Old	
		Male	Female	Male	Female	Male	Female
1	Kokrajhar	49.08	50.92	50.02	49.98	49.71	50.29
2	Dhubri	49.10	50.90	46.23	53.77	45.48	54.52
3	Goalpara	48.22	51.78	46.79	53.21	46.98	53.02
4	Barpeta	49.36	50.64	47.36	52.64	44.94	55.06
5	Morigaon	49.34	50.66	50.74	49.26	47.94	52.06
6	Nagaon	50.88	49.12	51.28	48.72	49.22	50.78
7	Sonitpur	52.56	47.44	54.31	45.69	51.51	48.49
8	Lakhimpur	50.18	49.82	52.99	47.01	52.60	47.40
9	Dhemaji	50.89	49.11	54.14	45.86	52.33	47.67
10	Tinsukia	51.41	48.59	53.59	46.41	51.49	48.51
11	Dibrugarh	50.95	49.05	53.11	46.89	50.35	49.65
12	Sivasagar	51.58	48.42	55.24	44.76	53.82	46.18
13	Jorhat	51.21	48.79	54.83	45.17	52.96	47.04
14	Golaghat	51.59	48.41	54.31	45.69	53.03	46.97
15	Karbi Anglong	51.93	48.07	53.43	46.57	51.21	48.79
16	Dima Hasao	54.27	45.73	53.93	46.07	51.94	48.06
17	Cachar	51.43	48.57	52.11	47.89	48.15	51.85
18	Karimganj	50.74	49.26	49.99	50.01	46.67	53.33
19	Hailakandi	52.29	47.71	52.97	47.03	49.69	50.31
20	Bongaigaon	48.16	51.84	47.20	52.80	46.51	53.49
21	Chirang	50.00	50.00	50.46	49.54	50.10	49.90
22	Kamrup	49.24	50.76	49.41	50.59	48.25	51.75
23	Kamrup Metropolitan	55.07	44.93	54.10	45.90	48.77	51.23
24	Nalbari	48.77	51.23	50.13	49.87	49.59	50.41
25	Baksa	48.40	51.60	50.28	49.72	49.31	50.69
26	Darrang	50.95	49.05	52.22	47.78	49.88	50.12
27	Udalguri	50.01	49.99	51.67	48.33	51.13	48.87
	Assam	50.69	49.30	51.44	48.56	49.32	50.67

Source: Computed by the author based on data from Census of India 2011.

A perusal of the above Table reveals a gender transition across age groups where male dominance is observed in 60–79 years whereas female dominance in 80+ years. This pattern reflects the higher longevity of females, a common demographic trend in India.

A closer examination shows that in districts namely Sonitpur, Lakhimpur, Dhemaji, Tinsukia, Sivasagar, Jorhat, Golaghat, Karbi Anglong and Dima Hasao show consistent male predominance across elderly age groups. In these districts, male shares exceed 51–55 percent in the Old–Old category, indicating either lower female survival in earlier decades, migration influences and gender differentials in healthcare access. Whereas districts with strong female advantage in the 80+ group are Dhubri, Barpeta, Goalpara, Bongaigaon, Kamrup, Karimganj, Nalbari and Baksa. These districts demonstrate pronounced female survival advantage at advanced ages. Apart from this, Chirang shows near parity across categories and Kokrajhar shows marginal differences between males and females.

Moreover, the Table gives a picture that Upper Assam districts namely Sivasagar, Jorhat, Golaghat show stronger male dominance, Lower Assam districts like Dhubri, Barpeta, Goalpara show greater female dominance in the oldest-old group and Central Assam districts show mixed patterns. This suggests regional variation in mortality experience, health infrastructure, socio-cultural conditions and historical demographic trends.

The ageing population has become an important demographic issue in India, and the pattern of elderly population distribution reveals significant gender variations across regions.

Rural elderly populations

Table 1.4 provides a detailed analysis of rural elderly populations, comparing male and female percentages across the three elderly age categories for each district, and revealing rural-specific gender disparities in ageing.

Table 1.4
District- wise disparities in rural male and female elderly populations in Assam, 2011

Sl. No.	District	Younger Old		Old- Old		Oldest- Old	
		Male	Female	Male	Female	Male	Female
1	Kokrajhar	49.07	50.93	50.05	49.95	49.82	50.18
2	Dhubri	48.99	51.01	46.44	53.56	46.08	53.92
3	Goalpara	48.04	51.96	46.67	53.33	47.27	52.73
4	Barpeta	49.31	50.69	47.55	52.45	45.39	54.61
5	Morigaon	49.28	50.72	50.82	49.18	48.01	51.99
6	Nagaon	50.67	49.33	51.75	48.25	49.68	50.32
7	Sonitpur	52.36	47.64	54.61	45.39	51.91	48.09
8	Lakhimpur	49.95	50.05	52.98	47.02	52.78	47.22
9	Dhemaji	50.63	49.37	54.11	45.89	52.56	47.44
10	Tinsukia	50.79	49.21	54.33	45.67	52.93	47.07
11	Dibrugarh	50.50	49.50	53.08	46.92	51.06	48.94
12	Sivasagar	51.49	48.51	55.33	44.67	54.41	45.59
13	Jorhat	50.74	49.26	55.30	44.70	54.13	45.87
14	Golaghat	51.61	48.39	54.36	45.64	53.25	46.75
15	Karbi Anglong	51.84	48.16	53.38	46.62	51.77	48.23
16	Dima Hasao	54.00	46.00	55.03	44.97	55.11	44.89
17	Cachar	51.39	48.61	52.91	47.09	49.71	50.29
18	Karimganj	50.83	49.17	50.37	49.63	47.41	52.59

19	Hailakandi	52.64	47.36	53.78	46.22	51.27	48.73
20	Bongaigaon	47.46	52.54	47.16	52.84	46.96	53.04
21	Chirang	49.99	50.01	50.69	49.31	50.73	49.27
22	Kamrup	49.19	50.81	49.41	50.59	48.42	51.58
23	Kamrup Metropolitan	51.45	48.55	52.09	47.91	48.17	51.83
24	Nalbari	48.48	51.52	50.19	49.81	49.83	50.17
25	Baksa	48.41	51.59	50.26	49.74	49.45	50.55
26	Darrang	50.77	49.23	52.35	47.65	49.85	50.15
27	Udalguri	50.01	49.99	51.69	48.31	51.20	48.80
	Assam	50.32	49.68	51.54	48.46	49.85	50.15

Source: Computed by the author based on data from Census of India 2011.

The rural elderly population in Assam shows noticeable gender differences across districts and age groups. At the state level, males slightly outnumber females in the younger old (50.32 percent) and old- old (51.54 percent) categories. However, in the oldest-old group, females (50.15 percent) slightly exceed males (49.85 percent), reflecting the general trend of higher female longevity.

District-level patterns vary considerably. Several districts such as Dhubri, Goalpara, Barpeta, and Bongaigaon show a higher proportion of female elderly, particularly in the older age groups. For instance, Dhubri records more than 53 percent females in both the old-old and oldest-old categories. In contrast, districts in Upper Assam such as Sivasagar, Jorhat, Tinsukia, and Dhemaji show a higher proportion of male elderly population. Similarly, the hill districts of Karbi Anglong and Dima Hasao also exhibit male dominance among the elderly. On the other hand, districts such as Chirang, Baksa, and Udalguri display a nearly balanced gender distribution.

Overall, the data indicate clear spatial disparities in the gender composition of the rural elderly population across the districts of Assam, influenced by factors such as longevity differences, migration, and socio-economic conditions.

Urban elderly population

Table 1.5 presents the urban elderly population across districts, highlighting male and female shares within the younger-old, old-old, and oldest-old categories, and showing the extent of gender differences in urban contexts.

Table 1.5
District- wise disparities in urban male and female elderly populations in Assam, 2011

Sl. No.	District	Younger Old		Old- Old		Oldest- Old	
		Male	Female	Male	Female	Male	Female
1	Kokrajhar	49.17	50.83	49.52	50.48	47.97	52.03
2	Dhubri	49.71	50.29	44.93	55.07	41.36	58.64
3	Goalpara	49.29	50.71	47.56	52.44	45.02	54.98
4	Barpeta	49.75	50.25	45.75	54.25	40.78	59.22
5	Morigaon	50.14	49.86	49.51	50.49	47.06	52.94
6	Nagaon	51.94	48.06	48.73	51.27	46.39	53.61
7	Sonitpur	54.21	45.79	51.88	48.12	48.06	51.94
8	Lakhimpur	52.43	47.57	53.13	46.87	50.36	49.64
9	Dhemaji	54.37	45.63	54.52	45.48	48.85	51.15
10	Tinsukia	53.41	46.59	51.41	48.59	47.69	52.31

11	Dibrugarh	52.67	47.33	53.23	46.77	48.03	51.97
12	Sivasagar	52.41	47.59	54.39	45.61	48.09	51.91
13	Jorhat	53.03	46.97	53.05	46.95	48.62	51.38
14	Golaghat	51.50	48.50	53.95	46.05	51.35	48.65
15	Karbi Anglong	52.68	47.32	53.93	46.07	45.66	54.34
16	Dima Hasao	55.11	44.89	50.22	49.78	41.13	58.87
17	Cachar	51.51	48.46	49.41	50.59	42.57	57.43
18	Karimganj	50.12	49.88	46.98	53.02	40.22	59.78
19	Hailakandi	49.13	50.87	46.08	53.92	37.40	62.62
20	Bongaigaon	51.53	48.47	47.48	52.52	43.95	56.05
21	Chirang	50.09	49.91	48.23	51.77	43.96	56.04
22	Kamrup	49.62	50.38	49.42	50.58	46.55	53.45
23	Kamrup Metropolitan	55.71	44.29	54.51	45.49	48.90	51.10
24	Nalbari	50.93	49.07	49.62	50.38	47.70	52.30
25	Baksa	47.98	52.02	51.91	48.09	36.84	63.16
26	Darrang	53.33	46.67	50.39	49.61	50.35	49.65
27	Udalguri	49.94	50.06	51.31	48.69	50.00	50.00
	Assam	52.61	47.39	50.95	49.05	46.30	53.70

Source: Computed by the author based on data from Census of India 2011.

The urban elderly population in Assam shows noticeable gender disparities across districts. At the state level, males dominate the younger old category (52.61 percent) and slightly outnumber females in the old-old category (50.95 percent). However, in the oldest-old group, females constitute a higher proportion (53.70 percent) compared to males (46.30 percent), indicating greater female longevity in urban areas. District-level variations are significant. Several districts such as Dhubri, Barpeta, Karimganj, and Hailakandi show a strong female predominance in the oldest-old category, with female shares exceeding 58–62 percent in some cases. In contrast, districts like Kamrup Metropolitan, Sonitpur, Lakhimpur, and Dhemaji show relatively higher proportions of male elderly, particularly in the younger-old and old-old age groups. Some districts such as Udalguri display a nearly balanced gender composition in certain age groups. Overall, the data reveal clear district-level disparities in the gender composition of the urban elderly population, influenced by factors such as longevity differences, migration patterns, and socio-economic conditions.

Conclusion

The present study examined the spatial distribution and gender disparities of the ageing population in Assam using district-level data from the Census of India 2011. The analysis shows that the majority of the elderly population belongs to the younger-old age group (60–69 years), indicating that the state is currently experiencing a moderate stage of demographic ageing. However, noticeable spatial disparities exist across districts.

Districts such as Jorhat and Nalbari exhibit relatively higher proportions of ageing population, reflecting more advanced demographic transition due to better socio-economic conditions, improved healthcare facilities and lower fertility levels. In contrast, the hill districts of Karbi Anglong and Dima Hasao record the lowest proportion of elderly population, indicating an early stage of demographic transition with comparatively younger population structures. The study also reveals significant gender disparities across age groups. Male dominance is observed in the younger-old and old-old categories, whereas females outnumber males in the oldest-old (80+) category, reflecting the higher longevity of females. This pattern is consistent with broader demographic trends observed in India. District-level variations further highlight that some districts show

stronger male dominance, while others exhibit greater female survival advantages at advanced ages. Further, the analysis of rural–urban differences indicates that urban areas show relatively stronger female dominance in the oldest-old age group, suggesting better survival conditions and healthcare access for elderly women in urban centres.

Overall, the study highlights clear regional and gender disparities in the ageing population across districts of Assam. With the gradual increase in the elderly population, there is a growing need for region-specific social security measures, healthcare services and welfare programmes to improve the quality of life of the ageing population.

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