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CHRONIC DISEASE BURDEN AMONG OLDER ADULTS IN INDIA: A SOCIO-DEMOGRAPHIC AND SPATIAL ANALYSIS

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ABSTRACT

India is currently undergoing a rapid epidemiological transition characterized by the increasing prevalence of chronic non-communicable diseases (NCDs) alongside the persistence of acute infectious illnesses. This dual burden is particularly evident among older adults, who are vulnerable to both long-term degenerative conditions and environmentally driven infectious diseases. The present study examines the prevalence, regional distribution, and socio-demographic determinants of chronic diseases among older adults in India while comparing these patterns with selected acute diseases. Data were drawn from the Longitudinal Ageing Study in India (LASI) Wave I (2017–18), comprising 31,464 individuals aged 60 years and above. Descriptive, bivariate, and spatial analyses were employed to assess disease prevalence and geographical variations. Findings indicate that hypertension (35.04%), chronic bone and joint disorders (17.80%), diabetes (15.49%), and chronic lung disease (7.55%) are the most prevalent chronic conditions among older adults. Considerable interstate variation was observed, with hypertension ranging from 14.38% in Nagaland to 56.78% in Goa and diabetes ranging from 5.35% in Meghalaya to 35.57% in Kerala. Women, urban residents, individuals aged 70–79 years, and economically affluent groups reported higher prevalence of chronic conditions. Acute diseases such as diarrhoea and malaria remained concentrated in socio-economically disadvantaged regions, highlighting persistent environmental and healthcare challenges. The findings underscore the existence of a dual burden of disease among India's ageing population and call for integrated, region-specific public health strategies that address both chronic disease management and infectious disease prevention.

KEYWORDS: *Acute diseases, Chronic diseases, Elderly, Epidemiological transition, Health inequality, LASI.*

INTRODUCTION

Population ageing has emerged as one of the most significant demographic transformations of the twenty-first century. Improvements in healthcare services, advances in medical technology, declining fertility rates, and reductions in mortality have substantially increased life expectancy worldwide, resulting in a rapid growth of the elderly population (Beard et al., 2016; Bloom et al., 2015). India is undergoing a similar demographic transition, with the number and proportion of older adults increasing steadily over time. Recent estimates suggest that India's elderly population is expected to grow considerably in the coming decades, creating important challenges for healthcare systems, social welfare programmes, and long-term care services (Arokiasamy et al., 2022; Dey, 2017).

Ageing is frequently associated with an increased risk of morbidity, disability, and functional dependence. Older adults are particularly vulnerable to chronic diseases that require long-term treatment and continuous medical attention (Prince et al., 2015). Hypertension, diabetes, cardiovascular diseases, chronic respiratory diseases, and cancer are among the leading causes of morbidity and mortality in later life, adversely affecting quality of life and increasing healthcare expenditure (Beard et al., 2016; Prabhakaran et al., 2018). As longevity increases, the burden of chronic diseases among older populations has become a major public health concern worldwide (Bloom et al., 2015).

India's health profile has undergone a substantial transformation over the past few decades. While communicable diseases historically dominated the disease burden, non-communicable diseases (NCDs) have emerged as the leading causes of mortality and disability (Patel et al., 2011; Dandona et al., 2017). Rapid urbanization, lifestyle modifications, unhealthy dietary patterns, physical inactivity, tobacco consumption, and population ageing have accelerated the rise of chronic diseases across the country (Prabhakaran et al., 2018). Despite this epidemiological transition, infectious diseases continue to persist in several regions due to inadequate sanitation, environmental risks, poverty, and unequal access to healthcare services (Boutayeb, 2006).

The simultaneous presence of communicable and non-communicable diseases has created a dual burden of disease, particularly in low- and middle-income countries such as India (Boutayeb, 2006). This phenomenon is especially relevant among older adults, who are more susceptible to both chronic illnesses and acute health conditions. Evidence from the Longitudinal Ageing Study in India (LASI) indicates that older adults experience substantial inequalities in disease burden, influenced by socioeconomic status, place of residence, educational attainment, and healthcare accessibility (Arokiasamy et al., 2022; Chauhan et al., 2022a).

Furthermore, considerable regional variation exists in disease prevalence across India. States that have advanced further in demographic and epidemiological transitions often report higher prevalence of diagnosed chronic diseases due to greater awareness, better healthcare infrastructure, and improved diagnostic facilities, whereas less developed regions continue to experience

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underdiagnosis and limited access to healthcare services (Dandona et al., 2017). These disparities highlight the importance of examining disease patterns within a spatial and socio-demographic framework.

Recent studies using LASI data have documented a growing burden of chronic diseases and multimorbidity among older adults in India (Chauhan et al., 2022b; Patel et al., 2023; Puri & Singh, 2022). However, most existing research focuses on individual chronic conditions or multimorbidity, while relatively limited attention has been paid to the broader coexistence of chronic and acute diseases and their geographical distribution across states and union territories. Understanding these patterns is essential for developing evidence-based policies aimed at promoting healthy ageing and reducing health inequalities among older adults.

Using data from the Longitudinal Ageing Study in India (LASI) Wave I (2017–18), the present study examines the prevalence and distribution of diagnosed diseases among older adults aged 60 years and above. Specifically, the study aims to estimate the prevalence of major chronic diseases, assess socio-demographic differentials, examine regional and state-level variations, and explore the broader implications of the dual burden of disease among India's ageing population.

DATA AND METHODOLOGY

The study uses data from the Longitudinal Ageing Study in India (LASI) Wave I conducted during 2017–18. LASI is the first nationally representative longitudinal survey focusing on the health, economic, and social well-being of India's ageing population. The survey covers all states and union territories and provides extensive information on health conditions, healthcare utilization, and socio-economic characteristics.

The analytical sample consists of 31,464 individuals aged 60 years and above. Diagnosed chronic diseases considered in the study include hypertension, diabetes, cancer, chronic lung disease, chronic heart disease, stroke, chronic bone and joint disorders, neurological or psychiatric conditions, and high cholesterol.

Descriptive statistics were used to estimate disease prevalence. Bivariate analysis was conducted to examine variations across age groups, sex, residence, marital status, religion, caste, wealth status, and working status. State-level prevalence patterns were visualized through choropleth mapping techniques to identify geographical disparities.

RESULTS AND DISCUSSION

Table 1 summarizes the socio-demographic profile of 31,464 older adults aged 60 years and above included in the study. Most of the respondents were in the younger elderly age group of 60–69 years (60.3%). Females made up a slightly larger share of the sample than males (52.0% vs. 48.0%). Most older adults lived in rural areas (65.9%), reflecting the predominantly rural nature of India's ageing population, and nearly two-thirds were currently married (63.3%).

In terms of social and cultural background, Hindus formed the largest religious group (73.2%), while Other Backward Classes (OBCs) accounted for the highest proportion among caste categories (39.1%). The distribution of respondents across wealth quintiles was even, with approximately one-fifth represented in each economic group. Regarding employment status, a greater proportion of older adults were not engaged in work (59.0%) compared to those who were still economically active (41.0%). Overall, these characteristics highlight the diversity of the study population and suggest that the sample provides a broad representation of the socio-economic and demographic realities of older adults in India.

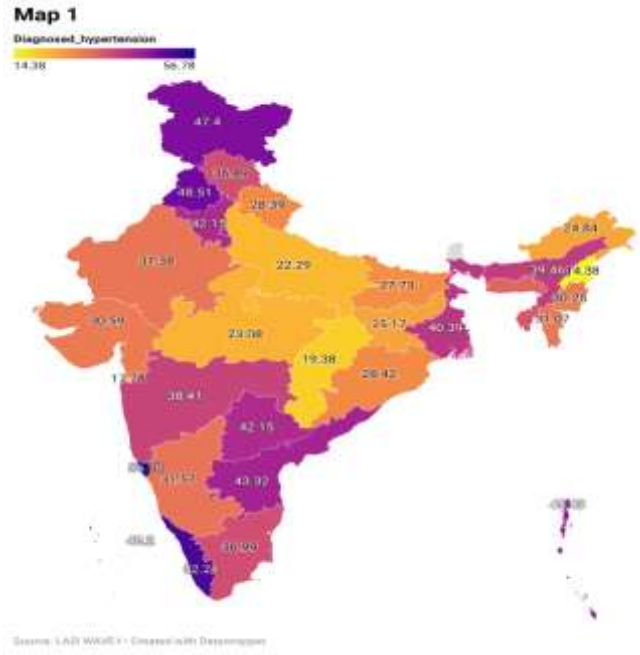
Table 1: Background Variable	Number	Percentage
Age		
60-69	18,974	60.3
70-79	9,101	28.93
80+	3,389	10.77
Gender		
Male	15,098	47.98
Female	16,366	52.02
Place of residence		
Rural	20,725	65.87
Urban	10,739	34.13
Marital Status		
Currently married	19,920	63.31
Widowed	10,719	34.07
Divorced	89	0.28
Separated	166	0.53
Deserted	99	0.31
Live-in relationship	170	0.54
Never married	301	0.96

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Religion		
No religion	65	0.21
Hindu	23,037	73.22
Muslim	3,731	11.86
Christian	3,150	10.01
Other	1480	4.93
Caste		
Scheduled caste	5,140	16.9
Scheduled tribe	5,173	17.01
Other Backward Class (OBC)	11,886	39.08
None of them	8,218	27.02
Wealth Index		
Poorest	6,484	20.61
Poorer	6,477	20.59
Middle	6,416	20.39
Richer	6,170	19.61
Richest	5,917	18.81
Working status		
Yes	9,307	41.04
No	13,373	58.96

Map 1 reveals substantial interstate variation in the prevalence of diagnosed hypertension among older adults in India. Goa recorded the highest prevalence (56.78%), followed by Kerala (52.24%), Jammu & Kashmir (48.51%), Himachal Pradesh (47.40%), and Punjab (42.15%). In contrast, Nagaland reported the lowest prevalence (14.38%), followed by Maharashtra (17.78%), Chhattisgarh (19.38%), and Uttar Pradesh (22.29%). Most southern and northern states exhibited relatively higher prevalence, whereas several northeastern and central states showed lower levels of diagnosed hypertension.

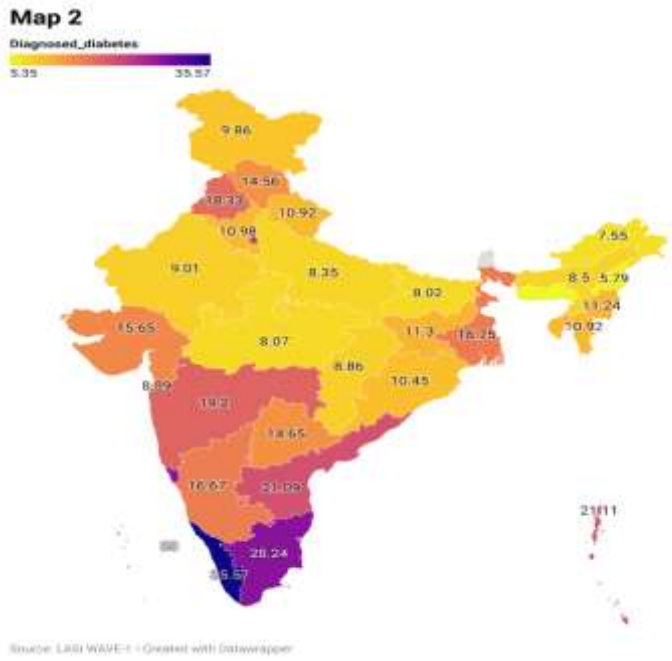
The observed pattern suggests that hypertension is more commonly diagnosed in states with better healthcare infrastructure, higher levels of urbanization, and greater health awareness. Conversely, lower prevalence in some states may partly reflect underdiagnosis and limited access to screening services. The wide gap of over 42 percentage points between Goa and Nagaland highlights significant regional inequalities in the burden and detection of hypertension among India's elderly population, emphasizing the need for targeted state-specific interventions for early diagnosis and effective disease management.



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Map 2 illustrates significant regional disparities in the prevalence of diagnosed diabetes among older adults in India. Kerala recorded the highest prevalence (35.57%), followed by Tamil Nadu (28.24%), Andhra Pradesh (21.09%), and Maharashtra (19.20%). Relatively high prevalence was also observed in Punjab (18.33%), West Bengal (16.75%), Karnataka (16.67%), and Gujarat (15.65%). In contrast, Meghalaya reported the lowest prevalence (5.35%), followed by Arunachal Pradesh (5.79%), Assam (7.55%), Bihar (8.02%), and Uttar Pradesh (8.35%).

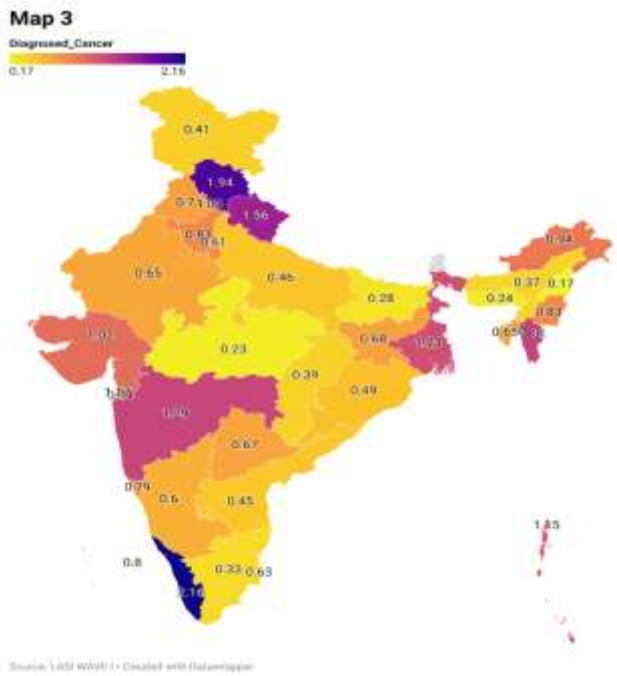
A clear geographical pattern emerges, with southern states exhibiting a substantially higher burden of diabetes compared to many northern, central, and northeastern states. The prevalence in Kerala is more than six times higher than that of Meghalaya, highlighting considerable regional inequalities in diabetes burden among the elderly. These variations may be associated with differences in lifestyle factors, dietary habits, urbanization, population ageing, and access to healthcare services. The findings indicate that diabetes has become a major public health concern, particularly in southern India, underscoring the need for targeted prevention, regular screening, and effective disease management among older adults.



Map 3 shows notable regional variation in the prevalence of diagnosed cancer among older adults across India. Kerala reported the highest prevalence (2.16%), followed by Punjab (1.94%), Bihar (1.56%), Maharashtra (1.29%), and West Bengal (1.23%). In contrast, Nagaland recorded the lowest prevalence (0.17%), while relatively low prevalence was also observed in Madhya Pradesh (0.23%), Assam (0.24%), Bihar (0.28%), and Tamil Nadu (0.33%).

Although the overall prevalence of diagnosed cancer remains comparatively low compared to other chronic diseases, the geographical disparities are substantial, with the prevalence in Kerala being more than twelve times higher than that in Nagaland. Higher prevalence in states such as Kerala, Punjab, Maharashtra, and West Bengal may reflect better diagnostic facilities, greater health awareness, longer life expectancy, and higher detection rates. Conversely, lower prevalence in several northeastern and central states may be influenced by underdiagnosis, limited access to specialized healthcare services, and lower rates of cancer screening. These findings highlight the need to strengthen early detection programmes and improve access to cancer diagnosis and treatment, particularly in underserved regions.

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Map 4 demonstrates considerable regional variation in the prevalence of diagnosed chronic lung disease among older adults in India. Rajasthan reported the highest prevalence (14.76%), followed by Tamil Nadu (13.48%), Kerala (12.19%), West Bengal (10.91%), Karnataka (9.82%), and Telangana (9.78%). In contrast, Nagaland recorded the lowest prevalence (1.32%), while Assam (1.95%), Arunachal Pradesh (3.14%), Jharkhand (3.47%), and Bihar (4.20%) also reported relatively low prevalence levels.

A distinct geographical concentration of chronic lung disease is evident in western, southern, and eastern India, whereas several northeastern states exhibit comparatively lower prevalence. The prevalence in Rajasthan is more than eleven times higher than that in Nagaland, indicating substantial regional disparities. These differences may be associated with variations in environmental conditions, air pollution, smoking and tobacco use, occupational exposure, indoor biomass fuel consumption, and access to healthcare services. The findings suggest that chronic respiratory diseases remain a significant public health concern among older adults and highlight the need for region-specific interventions focusing on early diagnosis, pollution control, smoking cessation, and improved respiratory healthcare services.

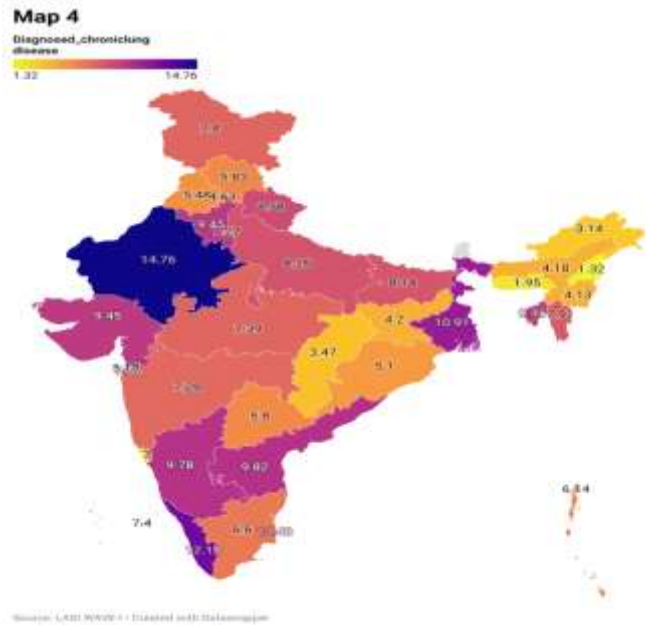


Figure 5 shows substantial interstate variation in the prevalence of diagnosed chronic heart disease among older adults in India, ranging from 0.31% to 14.14%. The highest prevalence is observed in Punjab (14.14%), followed by Kerala (12.27%), Jammu & Kashmir (9.86%), and West Bengal (9.09%), indicating notable hotspots in northern and southern India. In contrast, several northeastern and central states, including Arunachal Pradesh (0.31%), Nagaland (0.33%), Jharkhand (1.16%), and Odisha (1.46%),

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report comparatively lower prevalence. The spatial pattern suggests that states with advanced demographic and epidemiological transitions, higher life expectancy, and better healthcare access tend to report a greater burden of diagnosed chronic heart disease. These findings highlight significant regional disparities and emphasize the need for targeted cardiovascular screening, prevention, and management strategies among older populations.

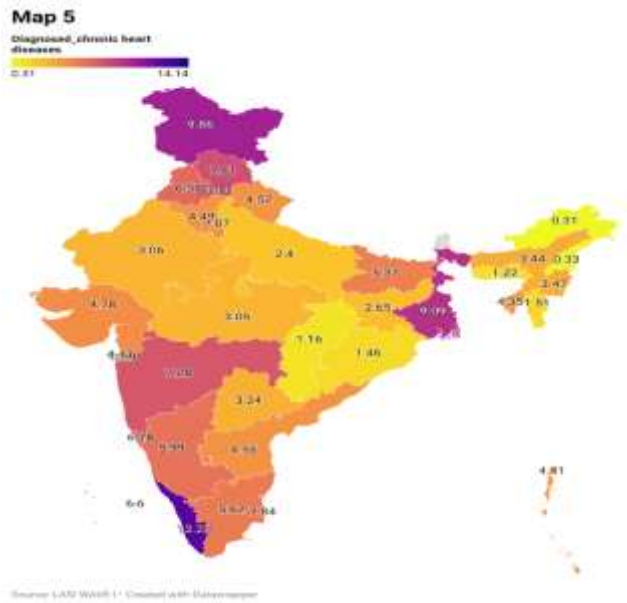


Table 2 highlights notable differences in the prevalence of diagnosed chronic conditions among older adults across demographic and socioeconomic groups. Hypertension was the most common condition, affecting 38.32% of individuals aged 70–79 years and 38.89% of women, compared to 30.85% of men. Diabetes was more prevalent among urban residents (25.81%) than among rural residents (10.15%), and its prevalence increased steadily from 10.71% in the poorest to 22.00% in the richest wealth quintiles. Heart disease showed a similar pattern, with prevalence reaching 7.78% in urban areas compared to 3.58% in rural areas and rising from 3.06% among the poorest to 7.91% among the richest households. Lung disease increased with age, affecting 9.68% of those aged 80 years and above compared to 6.32% among those aged 60–69 years. Cancer was relatively uncommon across all groups, ranging from 0.39% among the poorest to 1.44% among the richest.

Overall, chronic conditions were more frequently reported among urban, wealthier, and non-working older adults, with non-working individuals showing substantially higher prevalence of hypertension (37.60% vs. 22.89%), diabetes (17.74% vs. 9.42%), lung disease (9.47% vs. 5.34%), and heart disease (6.16% vs. 2.92%) than those who were still working. These patterns suggest that ageing, socioeconomic status, urban living, and healthcare access play important roles in shaping the burden of chronic diseases among older adults.

TABLE 2: Diagnosed chronic conditions or diseases

Background Variable	Hypertension	Diabetes	Cancer	Lung disease	Heart diseases
Age					
60-69	33.22	15.66	0.78	6.32	4.62
70-79	38.32	16.63	0.75	9.34	5.74
80+	36.39	11.46	0.68	9.68	5.24
Gender					
Male	30.85	16.25	0.69	8.31	5.89
Female	38.89	14.78	0.82	6.85	4.2
Place of residence					
Rural	29.33	10.15	0.63	7.61	3.58
Urban	46.08	25.81	1	7.43	7.78
Marital Status					
Currently married	33.29	16.47	0.79	7.4	5.47
Widowed	38.53	13.66	0.75	7.96	4.28
Divorced	32.95	11.36	0	5.68	4.55
Separated	28.92	11.45	0.6	9.64	1.81
Deserted	34.34	7.07	0	3.03	1.01

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Live-in relationship	38.46	35.5	0	7.1	5.33
Never married	28.67	10.37	0.33	4.01	3.68
Religion					
No religion	23.08	12.31	0	10.77	1.54
Hindu	33.5	14.96	0.72	7.7	4.78
Muslim	42.26	18.47	0.83	9.27	7.63
Christian	33.39	15.2	0.83	5.29	3.6
Other	44.85	16.87	1.02	5.62	5.15
Caste					
Scheduled caste	30.74	11.46	0.62	8.17	3.94
Scheduled tribe	24.4	8.91	0.48	5.35	1.72
Other Backward Class (OBC)	35.06	16.22	0.6	8.27	5
None of them	42.87	20.41	1.17	7.59	7.48
Wealth Index					
Poorest	26.65	10.71	0.39	6.67	3.06
Poorer	31.35	12.53	0.56	7.42	3.64
Middle	34.64	14.91	0.69	7.41	4.89
Richer	39.61	17.97	0.78	7.66	5.83
Richest	43.91	22	1.44	8.71	7.91
Working status					
Yes	22.89	9.42	0.37	5.34	2.92
No	37.6	17.74	0.92	9.47	6.16

CONCLUSION

The findings of this study indicate that chronic diseases constitute a significant health challenge among older adults in India. Hypertension, diabetes, chronic lung disease, and heart disease affect a considerable proportion of the elderly population, although their prevalence varies markedly across states and socio-demographic groups. Such variations reflect the diverse social, economic, and healthcare contexts within which older adults experience ageing and health.

The study reveals clear regional differences in disease prevalence, with several southern and northern states reporting a higher burden of chronic conditions than many northeastern and central states. Differences likely influence these patterns in population ageing, lifestyle practices, healthcare utilization, and the availability of diagnostic services. At the same time, lower prevalence in some regions may not necessarily imply better health outcomes, as disparities in healthcare access and disease detection remain important concerns.

Socio-economic differences were also evident. Chronic diseases were more frequently reported among urban residents, wealthier households, and older adults who were no longer engaged in work. These findings suggest that both lifestyle-related factors and differences in healthcare access play a role in shaping disease patterns among older adults. The results further highlight the complex relationship between ageing, social circumstances, and health in later life.

As India's elderly population continues to expand, the growing burden of chronic diseases will require greater attention from policymakers and healthcare providers. Strengthening primary healthcare, promoting regular screening and early diagnosis, and improving access to affordable treatment are essential steps toward addressing these challenges. Efforts should also focus on reducing regional and socio-economic inequalities in healthcare to ensure that older adults can benefit from timely diagnosis and appropriate care regardless of where they live.

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