Prevalence and Health Seeking Behaviour of Non-Communicable Diseases (NCDs) Among Elderly in India: Trends, Patterns and Determinants

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ABSTRACT:

Elderly population in India is increasing fast which indicates a growing share of population with more special needs for health and support. Understanding the morbidities and health-seeking behaviour of elderly is essential for strengthening geriatric health-care services delivery. The objective of this study was to study the trends, patterns and determinants of incidence and health seeking behaviour of NCDs among elderly in India. For this study four rounds of NSS unit level data has bee used. Prevalence rate of NCDs across socio-economic groups have been calculated for four rounds of NSS to see the changes. Logistic regression has been used to examine various factors that determine the prevalence as well as health seeking behaviour of elderly suffering from NCDs. The result showed that the overall NCDs prevalence is increasing over the years irrespective of socio-economic groups. However, it is more pronounced among elderly of urban area, currently unmarried, higher MPCE quintile, general catse, highly educated and southern region of India. The probability of suffering from NCDs increases with high income, unavailability of protected water, unclean cooking fuel usage, lack of latrine facility and belonging to northern region of India. As far as health seeking behaviour is concerned, elderly suffering from NCDs seek treatment from formal care than informal or no care at all if they are highly educated, from urban area, currently married and from western and southern region of India. Therefore, the policy implication of the study calls for the availability and accessibility of adequate medical facilities at affordable costs, development of a strong network of public health facilities primarily in rural India.

Keywords: *NCD, Health Seeking Behaviour, Elderly, NSS Data, SDG*

INTRODUCTION:

Non-communicable diseases (NCDs) have emerged as one of the most significant public health challenges of the twenty-first century. NCDs cause about 40 million deaths annually, around 71–74% of all global deaths, and are now 7 of the top 10 causes of deathgroup of medical conditions characterized by their long duration and slow progression, often stemming from an intricate interplay of genetic, physiological, behavioral, and environmental determinants [1]. Furthermore, NCDs are projected to contribute nearly two-thirds of the global burden of disease by 2030. Among all NCD-related deaths, four major diseases account for more than 80 percent of premature mortality: cardiovascular diseases (17.9 million deaths), cancers (9.3 million), chronic respiratory diseases (4.1 million), and diabetes (2.0 million) [2]. India has witnessed a rapid epidemiological transition in recent decades, characterized by a shift from communicable diseases to non-communicable diseases [3]. This shift is largely driven by rapid urbanization, an aging demographic, and the proliferation of modifiable lifestyle risk factors, including tobacco use, physical inactivity, and unhealthy dietary patterns [4]. According to the WHO NCD India Profile (2018), chronic conditions account for an estimated 63% of all deaths nationwide, led by cardiovascular diseases (27%), followed by chronic respiratory diseases (11%), cancers (9%), and diabetes (3%). Empirical evidence from the Ministry of Health and Family Welfare (MOHFW) reinforces this trajectory, showing that the contribution of NCDs to India's total disability-adjusted life years (DALYs) escalated dramatically from 30% in 1990 to 55% in 2016, while the proportion of total deaths ascribed to NCDs rose from 37% to 61% over the same period (MOHFW, 2017). Recognizing the global severity of this structural shift, the United Nations' 2015 Agenda for Sustainable Development integrated Sustainable Development Goal (SDG) target 3.4, explicitly mandating a one-third reduction in premature mortality from NCDs by 2030 through prevention and treatment [5].

NCDs are particularly significant among older adults because chronic illnesses are strongly associated with ageing. Advancing age is accompanied by a decline in intrinsic capacity and functional ability, which adversely affects various physiological systems of the body [6, 7]. Population ageing has become a major demographic phenomenon across the world. According to the World Health Organization, by 2050 nearly 80 percent of older persons will reside in low- and middle-income countries. The pace of population ageing is much faster today than in the past. In 2020, the number of people aged 60 years and above surpassed the number of children below the age of five globally. Between 2015 and 2050, the proportion of the world population aged 60 years and above is projected to almost double from 12 percent to 22 percent [6]. India is also undergoing a similar demographic transition (WHO, 2025). In 2022, nearly 10.5 percent of India's population, approximately 149 million people, belonged to the elderly age group [8]. According to the United Nations Population Fund India Ageing Report (2023), the elderly population in India is expected to increase rapidly and reach 20.8 percent of the total population by 2050. In absolute terms, the elderly population is projected to rise from 149 million in 2022 to nearly 347 million by 2050. India has already entered the phase of population ageing, with the growth of the elderly population occurring at a much faster pace than in several other regions of the world [9]. The 60+ population was about 7% in 2009 (88 million) and is projected to reach 20% (≈315 million) by 2050 [8]**.**

The increasing share of the elderly population has created substantial challenges for India's healthcare system, which continues to face infrastructural and institutional limitations [8, 10]. Managing geriatric health requirements presents distinct clinical and operational challenges, as older adults frequently experience complex, disabling, and co-morbid conditions that require polypharmacy, specialized physiotherapy, and sustained long-term rehabilitation [11]. Despite these growing demands, dedicated public geriatric infrastructure in India remains underdeveloped [12], constrained by an acute shortage of specialized, trained human resources and a structural absence of institutional geriatric care pathways beyond urban tertiary hospitals [13].

In the absence of robust supply-side infrastructure, demand-side determinants—specifically individual health-seeking behaviors—play a foundational role in achieving healthy and active aging. Timely medical initiation and appropriate health-system interaction by older adults can mitigate clinical complications and arrest NCD progression [6]. However, geriatric health-seeking pathways are not uniform; they are heavily modified by an array of intersecting structural factors, including household socioeconomic status, chronological age, gender dynamics, internal family authority structures, financial security, perceived illness severity, and physical access to formal facilities [14].

A major barrier within public health research is that a lack of precise empirical data regarding these specific socioeconomic and cultural determinants can stunt progress on health equity initiatives, a limitation often cited as a critical vulnerability in public health planning [15]. To build responsive policy mechanisms that address these systemic challenges, it is essential to map the exact distributional patterns and social gradients governing NCD incidence among older cohorts. To address the gaps identified in the literature and offer empirical clarity for health planning, this study seeks to answer the following research questions:

1. What is the long-term trend in the incidence of self-reported morbidity among older adults in India?
2. What is the precise distributional pattern of NCD prevalence among the elderly across different socioeconomic groups, and how has this variance evolved over time?
3. What are the key demographic, economic, and environmental factors that statistically determine NCD prevalence among the elderly?
4. What are the primary structural and household determinants of formal health-seeking behavior among older adults suffering from NCDs?
5. Is there a significant rich-poor differential in NCD prevalence and corresponding health-seeking behavior among the elderly, and what factors contribute most to this disparity?

It is quite imperative to examine the various socioeconomic and cultural determinants of the incidence of NCDs, its trend as well as its pattern across socio-economic groups so that an effective policy mechanism can be framed to meet the inevitable challenges. It is because a lack of precise knowledge about the specific socioeconomic and cultural determinants of

health may produce modest progress on these essential social aspects that determine the health conditions which has been recognised as the failure of the public health system (Bandura, 1998). To meet the inevitable challenges, there is an urgent need for a study on the distributional pattern of incidence of NCDs and their determinants among which may help to stimulate coordinated efforts and conscious choice by society, organisations, public and private communities, and individuals. Therefore, the objective of present study is to study the trends, patterns and determinants of incidence and health seeking behaviour of NCDs among elderly in India. This study is very essential with respect to the emerging situation of NCDs especially catering to the older population in our country can be properly addressed by strengthening of geriatric health-care services and service delivery according to the needs with mitigation of the existing lacunae.

BRIEF LITERATURE REVIEW:

The demographic transition in India has precipitated a surge in the elderly population, who now face an increased prevalence of non-communicable diseases that account for approximately 60% of their total health burden [16]. This epidemiological shift is further complicated by significant urban-rural disparities, which necessitate a more nuanced understanding of how hypertension and diabetes specifically impact aging populations across diverse geographic settings. Beyond mere prevalence, it is critical to investigate the underlying treatment-seeking approaches of these patients to identify existing bottlenecks in healthcare accessibility and service utilization [17]. Recent findings indicate that over 87% of elderly individuals in urbanized settings suffer from at least one chronic condition, yet more than half of this cohort demonstrates inappropriate health-seeking behavior [18]. Factors such as limited formal education, socioeconomic disadvantage, and the persistence of preventable behavioral risk factors significantly impede the timely adoption of medical interventions [19, 20]. Furthermore, evidence from the National Sample Survey underscores that despite high levels of untreated morbidity, structural barriers and cost considerations continue to dictate patterns of healthcare access [21]. Beyond these socioeconomic constraints, the COVID-19 pandemic introduced additional layers of complexity, as fear of infection and the strain on existing health infrastructure led to significant delays in managing chronic conditions [22]. Furthermore, nationally representative datasets reveal that even when healthcare services are accessible, non-utilization persists due to complex interactions between socio-demographic determinants and individual health literacy [23]. The Longitudinal Ageing Study in India further illustrates this utilization gap, highlighting a marked preference for private healthcare providers over public facilities for outpatient care [24]. This trend persists even as distance to health facilities increases, with empirical evidence suggesting that rural patients frequently rely on private transportation to bypass nearer public facilities, often deterred by systemic issues such as inadequate infrastructure, long waiting times, and perceived inferior quality of care [24, 25].

DATA AND METHODS:

The unit-level health-specific data from three different rounds of NSSO is used in the analysis. These three rounds of the survey are population based for the whole country, and they are identical about the sampling design, content and coverage [26]. Hence, they give wide-ranging information on the nature of diseases. The aim of the health-specific data collected by the NSSO is to generate basic quantifiable evidence on the health-seeking behaviour of the sample households looking for treatment (ailments) for 365 days (hospitalisation cases) and 15 days (both cases of outpatients and hospitalisation). The information collected by NSSO in its 52nd round is about the health expenditure incurred on the treatment of more than 58 diseases, whereas the information collected in the 60th round covered 42 diseases. Similarly, the 71st round and 75th round covered more than 61 diseases. The NSSO usually adopts a stratified multi-stage sampling technique to collect data. It draws samples from almost all the states of the Indian union. The samples are adequately representative and provide robust estimation across the states by sector-wise (rural–urban) and selected variables. One of the vital advantages of these three rounds of NSSO devoted to collecting health information is that it enables us to determine the prevalence of diseases based on sex, age, caste, religion, level of education and consumption expenditure.

Disease Classification:

The NSSO provides data based on the nature of ailments too. The nature of ailments is nothing but the presence of diseases. These diseases may be in the form of CDs, NCDs and ODs. A person is considered to be suffering from a disease if there is a deviation

from the state of physical or mental well-being. However, people who are deprived of speech, hearing and locomotor disabilities are also considered sick and disease prone. The data on the diseases are collected for two reference periods namely 15 days and 365 days. For our analysis we have only taken 15 days reference period for our analysis. The NSSO also follows the international classification of disease and accordingly differentiations between major CDs and NCDs are also included in the NSSO (for details, refer to [27, 28].

Table-1: Classification of Diseases

Communicable Diseases (CDs)	***Non-communicable Diseases (NCDs)***	***Other Diseases (ODs)***
Diarrhoea/dysentery, gastritis, peptic, ulcer, warm-infection, hepatitis/jaundice, tuberculosis, diseases of the skin, sexually transmitted diseases, malaria, fever of unknown origin, mumps, diphtheria, amoebiosis, whooping cough, tetanus, filariasis	Heart diseases, hypertension, bronchial asthma, joint and bones disorder, diseases of kidney/urinary system, diabetes mellitus, accident/ injuries/burns/fracture/poisoning cancer and other tumours	Glaucoma, cataract, goitre/ thyroid, under-nutrition, anaemia, speech disorder, hearing disorder, diseases of mouth, teeth and gum, other diagnosed ailment and other undiagnosed
Source: *Based on NSSO data from various rounds.*		

Empirical Strategies:

Incidence:

Incidence = (number of cases of NCDs) / (total population)

Econometric Models:

Logistic regression has been used to find the significant factors of determining prevalence of NCD as well health seeking behaviour as our dependent variables are categorical variable. For NCD prevalence it is categorised as suffering from NCD=1 and otherwise=0. Similarly, for treatment seeking behaviour treatment taken=1 and otherwise=0 . In logistic regression, we need to use a complex formula and convert back and forth from the logistic equation to the OLS-type equation. The logistic formulas are stated in terms of the probability that $Y = 1$, which is referred to as P. The probability that Y is 0 is 1 - P.

$$\ln\left(\frac{P}{1-P}\right) = a + bX \qquad (1)$$

The *ln* symbol refers to a natural logarithm and $a + bX$ is our familiar equation for the regression line. Here X is the vector of independent variables.

P can be computed from the regression equation also. So, if we know the regression equation, we could, theoretically, calculate the expected probability that $Y = 1$ for a given value of X.

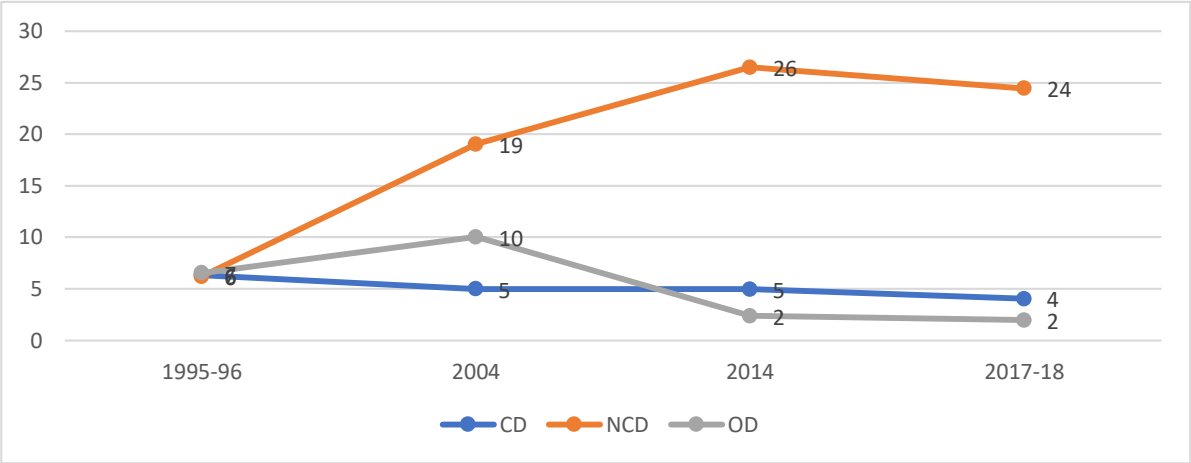
$$P = \frac{\exp(a+bX)}{1+\exp(a+bx)} = \frac{e^{a+bx}}{1+e^{a+bx}} \qquad (2)$$

RESULTS AND DISCUSSIONS:

Prevalence of NCDs and Its trends:

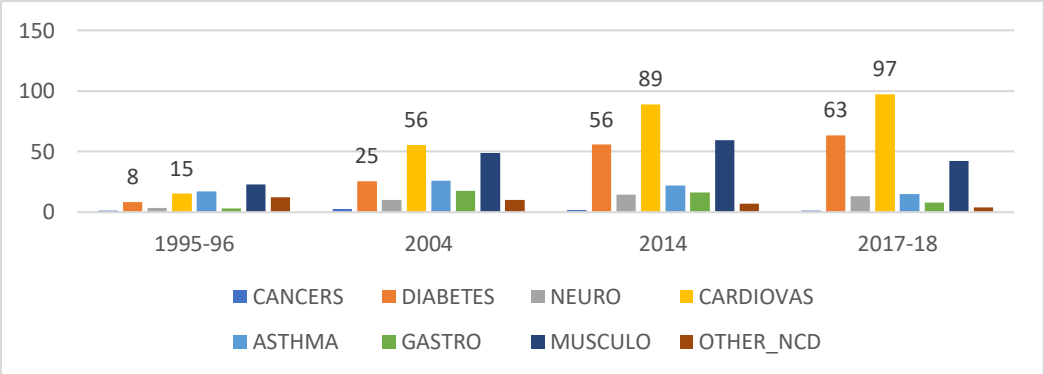
From fig-1 it is found that prevalence rate of NCDs are increasing over the years from 7 to 24 per thousand whereas CD has steadily declining from 6 to 4 per thousand elderly during 1995 to 2017. The prevalence rate of different disease under NCDs are shown in fig-2. It shows that the prevalence rate of cardiovascular (CV), diabetes and skeletomuscular diseases dominate among all the NCDs across different NSS rounds. There has been a drastic change in prevalence rate of CVD and diabetes over the years. The compound annual growth rate of these diseases are 8.8 and 9.6 percent respectively during the period 1995 and 2017. If we see the prevalence rate of NCDs at disaggregated level it is found that across socio-economic groups NCDs prevalence rate has increased several folds (see table-2). The growth of prevalence rate of NCDs is highest among the elderly belong to middle income, illiterate and below primary level of education, general and OBC caste, eastern and central regions.

Figure 1: Trends of Overall Self-Reported Morbidity Prevalence Rate (per 1000 population) Among Older Adults



Source: Author calculation based on various rounds of NSS data

Figure 2: Prevalence Rate of different NCDs among elderly from 1995 to 2017



Source: Author calculation based on various rounds of NSS data

Table-2: Prevalence rate (per 1000) of NCD among elderly by their socio-economic characteristics during 1995 and 2017

Socio-economic characteristics	1995-96	2004	2014	2017-18	CAGR
Gender					
Male	6	19	26	24	6.5
Female	6	19	27	24	6.4
Age group					
60-69	6	17	25	22	6.2
70-79	7	23	28	28	6.9
80+	7	22	31	34	7.2
Wealth Quintile					
Poorest	5	11	17	14	5.1
Poor	5	14	20	19	6.9
Middle	6	18	27	25	7.1
Rich	7	24	33	32	6.9
Richest	11	37	41	39	6.0
Place Of Residence					
Rural	6	16	23	21	6.1
Urban	8	29	35	32	6.4
Caste					
SC/ST	8	13	19	18	3.4
OBC	7	17	27	23	5.3
General	6	26	30	31	7.8
Education level					
iliterate	5	15	22	19	6.0
primary_below	8	25	33	30	6.1
middle_higher	10	28	32	32	5.4
diploma_graduate_abov	10	34	34	31	5.5
Region					
north	5	14	18	15	4.9
east	5	16	22	27	7.7
north-east	8	15	5	5	-1.9
central	2	11	14	13	7.9
west	6	25	19	23	6.4
south	11	28	46	38	5.7
Total	6	19	26	24	6.4

Source: Author calculation based on various rounds of NSS data

Prevalence of Three Major NCDs:

Among all NCDs, the prevalence rate of CV, diabetes and musculoskeletal diseases dominate the most. If we look at these three dominant NCDs prevalence rate across gender there is no much difference. But prevalence rate increases as age increases. CV and diabetes is more pronounced in urban (13 and 10 per thousand) than rural area (8 and 4 per thousand). As income level increases the prevalence rate of diabetes increases 7 folds from 2 per thousand for poorest MPCE quintile to 14 per thousand for richest MPCE quintile. A similar patten is found in case of CV.

Table-3: Prevalence rate (per 1000) of three major NCDs by gender, place of residence, wealth quintile and region

NCD diseases	DIABETES	CARDIO_VASCULAR	MUSCULO_SKELETAL
Gender			
male	7	10	4
female	6	10	5
Place of Residence			
rural	4	8	4
urban	10	13	4
Wealth Quintile			
poorest	2	4	4
poor	4	6	4
middle	6	10	5
rich	8	14	5
richest	14	18	4
north			
east	6	10	4
north-east	3	6	3
central	4	11	5
west	1	1	2
south	3	3	3
Total	7	10	3

Source: Author calculation based on various rounds of NSS data

Determinants of NCDs:

From logistic regression it is found that factors like place of residence, caste, marital status, standard of living, education level, basic household amenities like garbage disposal facility, latrine facility, protected drinking water facility, clean cooking fuel facility and region statistically significantly determine the prevalence of NCD among elderly in India. The likelihood of urban elderly suffering from NCDs are higher compared to rural elderly. Elderly belong to households with basic amenities like clean cooking fuel, garbage disposal facility, protected drinking water facility and latrine facility have less likelihood of suffering from NCDs than their counterpart. Currently unmarried have higher prevalence likelihood than married elderly. Rich elderly have more probability of suffering from NCDs than poorer elderly. Elderly belong to north easter region are less likelihood of suffering from NCDs than other parts of India.

Table-4: Logistic regression result on determinants of self-reported NCD prevalence among older adults in India, 2017-18

NCD (1) or No-NCD (0)	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Place of residence							
urban	.08	.03	2.66	.008	.021	.139	***
Gender							
female	-.03	.026	-1.18	.237	-.081	.02	
Caste							
obc	-.005	.034	-0.14	.887	-.071	.062	
general	.267	.035	7.68	0.000	.199	.335	***
Marital Status							
Currently not married	.222	.027	8.28	0.000	.169	.274	***
MPCE Quintile							
poor	.468	.043	11.02	0.000	.385	.552	***
middle	.606	.043	14.11	0.000	.522	.691	***
rich	.878	.045	19.58	0.000	.79	.966	***
richest	1.128	.048	23.27	0.000	1.033	1.224	***
Education Level							
primary or below	.21	.031	6.73	0.000	.149	.271	***
middle/higher	.109	.034	3.18	.001	.042	.176	***
diploma/graduate	.062	.048	1.31	.191	-.031	.156	

Cooking fuel							
Clean	-.164	.031	-5.33	0.000	-.225	-.104	***
Garbage Disposal							
yes	-.12	.028	-4.27	0.000	-.175	-.065	***
Latrine							
yes	-.46	.45	10.30	0.000	-.373	.548	***
Protected Drinking Water							
yes	-.342	.035	-9.83	0.000	-.41	-.274	***
Region							
east	.659	.04	16.45	0.000	.58	.737	***
North east	-1.17	.072	-16.19	0.000	-1.312	-1.029	***
central	.12	.045	2.66	.008	.032	.208	***
west	.48	.041	11.63	0.000	.399	.561	***
south	1.102	.036	30.50	0.000	1.031	1.172	***
Constant	-2.422	.067	-36.20	0.000	-2.553	-2.291	***

Mean dependent var	0.256	SD dependent var	0.436
Pseudo r-squared	0.096	Number of obs	44666
Chi-square	4888.770	Prob > chi2	0.000
Akaike crit. (AIC)	45930.565	Bayesian crit. (BIC)	46122.118

*** p<.01, ** p<.05, * p<.1

Determinants of Health Seeking Behaviour:

As far as factors that determine the treatment seeking behaviour is concerned factors like place of residence, marital status, standard of living (MPCE quintile), educational level, latrine facility and region found to be statistically significant. Elderly belong to urban area are more likely to seek treatment from formal care than informal or no treatment all in comparison to rural area if they are suffering from NCDs. Those who currently unmarried, belong to central region of India are less likely to seek treatment formal treatment compared to their counterpart which statistically significant at 1 percent level. Elderly with higher educational qualification have higher probability of formal treatment than illiterate and it is statistically significant at 5 percent level. Middle, rich and richest MPCE quintile have higher likelihood of treatment seeking than poorest MPCE quintile.

Table-5: Logistic regression result on determinants of health seeking behavior among older adults in India, 2017-18

Formal Treatment taken=1, Informal or no treatment=0	**Coef.**	**St.Err.**	**t-value**	**p-value**	**[95% Conf**	**Interval]**	**Sig**
Place of residence							
urban	.253	.137	1.84	.065	-.016	.523	*
Gender	0	.	.	.	.	.	
female	.051	.121	0.42	.673	-.187	.289	
Caste	0	.	.	.	.	.	
obc	.01	.142	0.07	.942	-.269	.289	
general	.09	.152	0.60	.551	-.207	.388	
Marital Status							
Currently not married	-.283	.12	-2.36	.018	-.517	-.048	**
MPCE Quintile	0	.	.	.	.	.	
poor	-.436	.250	-1.74	.006	-.062	-.349	
middle	.372	.166	2.24	.025	.047	.697	**
rich	.635	.185	3.43	.001	.272	.997	***
richest	1.27	.228	5.57	0	.823	1.717	***
Education Level							
primary or below	.053	.14	0.38	.707	-.222	.328	
middle/higher	.229	.173	1.32	.185	-.11	.568	
diploma/graduate	.431	.148	2.89	.058	.276	3.78	*
Cooking fuel							
Clean	.181	.132	1.37	.172	-.078	.44	
Garbage Disposal							
yes	-.131	.124	-1.06	.291	-.374	.112	
Latrine							
yes	.678	.159	4.26	0	.366	.99	***
Protected Drinking Water							
yes	.259	.159	1.63	.104	-.053	.572	

Region							
east	-.175	.185	-0.95	.344	-.538	.187	
North east	1.115	.259	4.31	0	.823	1.608	***
central	-.611	.192	-3.18	.001	-.987	-.235	***
west	.082	.214	0.38	.7	-.337	.501	
south	.644	.188	3.42	.001	.275	1.014	***
Constant	1.765	.273	6.46	0	1.23	2.3	***

Mean dependent var	0.966	SD dependent var	0.182
Pseudo r-squared	0.077	Number of obs	11275
Chi-square	258.255	Prob > chi2	0.000
Akaike crit. (AIC)	3156.172	Bayesian crit. (BIC)	3317.440

*** $p<.01$, ** $p<.05$, * $p<.1$

Source:

CONCLUSION:

Noncommunicable diseases (NCDs) are a major public health concern in the twenty-first century, not only because of the suffering they inflict on individuals but also because of the harm they do to the socioeconomic advancement of the country. The rapidly growing number of elderly people in India suggests that a larger proportion of the population has more specific demands for care and assistance. Strengthening the delivery of geriatric health care services requires an understanding of the morbidities and health-seeking behavior of the aged. This study set out to investigate the trends, patterns, and factors of NCD incidence and health-seeking behavior among India's senior population. The findings indicated that, regardless of socioeconomic group, the prevalence of NCDs is rising overall over time. Nonetheless, it is more noticeable among older people living in cities, those who are single at the moment, those in the upper MPCE quintile, those who are generally well-educated, and those who live in southern India. High wealth, lack of protected water, use of dirty cooking fuel, lack of latrine facilities, and residency in northern India all raise the likelihood of developing noncommunicable diseases (NCDs). In terms of health-seeking behavior, older adults with noncommunicable diseases (NCDs) who are highly educated, live in an urban location, are married, and are from western and southern India are more likely to seek formal care than informal or no care at all. As a result, the study's policy implications emphasize the need for a robust network of public health facilities, mainly in rural India, and the availability and accessibility of quality medical care at reasonable prices. There is north south divide in prevalence of NCDs in India. But interestingly it is found that though prevalence of NCDs in north is low but treatment seeking from formal care is low in that area. Therefore, regional disparity in health seeking behaviour need to be curbed through appropriate policies and programme.

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