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Research paper

A Cross-Sectional Study on Health Insurance Coverage among The Aging Population

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Abstract

The aging population is a global phenomenon, with the number of people aged 60 and above reaching 1.05 billion in 2020, representing 13.46% of the world's total population. This trend is expected to continue, with the population of older adults projected to reach 1.41 billion (16.46%) by 2030 and over 2 billion (22%) by 2050. In India, the elderly population is growing rapidly, with the number of people aged 60 and above expected to reach 324 million by 2050 (India Aging, Elderly to Make up 20% of Population by 2050: UNFPA Report, n.d.). However, health insurance coverage among the elderly population in India is poor, with estimates indicating that less than 1% of the elderly population has health insurance. This lack of coverage is more pronounced in developing cities like Chennai, where health insurance penetration is below 3%. In light of this background, the current study assesses health insurance coverage among the aging population in Chen-nai. Additionally, the study identifies factors associated with health insurance coverage among the elderly in Chennai. A household survey was conducted among people aged 60 and above, with a sample size of 120 in Chennai. The principal investigator collected responses through the interview schedule method. The results of the study revealed that 70% of the elderly respondents are dependent on their offspring. Of the 52.5% who have health insurance coverage, 56% are covered by private insurance, with the majority (60%) of these being employee-sponsored plans. Despite 58% of respondents suffering from chronic health issues, only 51% of this group are insured. A significant portion of the population remains uninsured, primarily due to a lack of awareness (39%). Additionally, 70% of the respondents regularly utilize healthcare services for checkups and outpatient department (OPD) care. Based on these key findings, a model has been developed to highlight the reasons for being uninsured, the challenges the aging population faces in obtaining insurance, the available options, and strategies to bridge the coverage gap. This model serves as an important takeaway for insurance providers and policymakers, emphasizing the need to educate the public to improve insurance coverage.

Keywords: *Aging Population; Chronic Conditions; Health Insurance; Healthcare Utilization; Non-Communicable Diseases.*

1. Introduction

The aging population is a global phenomenon, with significant implications for public health, social systems, and economies worldwide (Au et al., 2019). In 2020, the global population of individuals aged 60 and above reached 1.05 billion, accounting for 13.46% of the world's total population (Yang et al., 2023). This demographic shift is expected to continue, with projections indicating that by 2030, 1.41 billion people will be aged 60 or older, representing 16.46% of the global population. India is no exception to this trend. By 2050, this number is anticipated to exceed 2 billion, making up 22% of the world's population (India Aging, Elderly to Make up 20% of Population by 2050: UNFPA Report, n.d.). The country's elderly population is growing rapidly, with the number of individuals aged 60 and above expected to reach 324 million by 2050 (Wojnar, 2023). This surge in the aging population presents numerous challenges, particularly in the healthcare sector, where the demand for age-appropriate services and health insurance is expected to rise substantially (Khan et al., 2018). Despite the increasing need for healthcare, health insurance coverage among India's elderly population remains alarmingly low. Estimates suggest that less than 1% of the elderly in India have health insurance, with the situation being particularly dire in developing urban centers like Chennai, where health insurance penetration is below 3% (Gopal, 2024). This lack of coverage leaves a significant portion of the aging population vulnerable to financial strain in the event of illness, particularly chronic conditions that are prevalent in

older age. Given this context, this study aims to assess the health insurance coverage among the aging population in Chennai. Additionally, the study seeks to identify the factors associated with health insurance coverage among the elderly in this region.

2. Review of Literature

The global rise in the aging population has prompted a surge in research focused on promoting healthy aging and addressing the specific health needs of older adults (Anderson & Prohaska, 2014). As the global population experiences a demographic shift towards a higher proportion of older adults, new challenges and opportunities emerge, necessitating multidisciplinary approaches (Bloom et al., 2015).

Over the past few decades, India has made significant strides in improving health outcomes, yet its health insurance industry lags behind many other developing countries. Studies investigating the changes in India's health insurance sector highlight the issues and challenges it faces. Increasing penetration rates could be achieved through micro-insurance, group insurance, stricter government regulations on the private sector, and more initiatives to reach rural populations. Recent government schemes targeting rural areas have gained popularity and may offer an effective solution to avoid catastrophic health expenditures (Bhatia et al., 2018). The relationship between health insurance and economic performance has been explored by a meta-analysis that uncovers the underlying mechanisms linking the two (Fan et al., 2024).

Econometric methods are used in the study to estimate unit costs for India's National Health Insurance program, providing valuable insights for health technology assessment, budgeting, and forecasting, potentially applicable in other countries with limited cost data (Bahuguna et al., 2020). Given that most elderly individuals suffer from non-communicable diseases (NCDs), the study also examines healthcare utilization for NCD treatment among the elderly, the burden of out-of-pocket expenditures, and equity in the distribution of public subsidies (Dutta, 2020). The results indicate a pro-rich trend in healthcare utilization, particularly in rural India, calling for targeted policies to improve health equity (Bose & Banerjee, 2019). Further, the study investigates the incidence of catastrophic health expenditure (CHE) and unmet healthcare needs, focusing on potential differences between younger and older populations in Japan (Okamoto et al., 2024). It also explores the association between chronic conditions and limitations in daily living activities among older adults in India, finding a strong link between pre-existing chronic conditions and functional disability (Sharma et al., 2021). Alarmingly, a study conducted in Kolkata revealed that only 20% of households had health insurance coverage, with a majority unaware of the schemes' benefits (Mir, 2018). The probability of health insurance coverage among the elderly significantly depends on income, education, disease types, caste, family size, and most importantly, social relationships. The underprivileged groups have a higher likelihood of being covered by government-funded insurance, while the older people with higher income and education residing in urban areas have a higher likelihood of purchasing private health insurance (Chatterjee et al., 2022).

While existing literature has addressed the challenges faced by the aging population and health insurance coverage related to chronic diseases, this study uniquely connects insurance coverage with the factors influencing it, making it a highly relevant contribution to the field.

3. Materials and Methods

3.1. Objectives of the study

- To find out the health insurance coverage among the aging population in Chennai.
- To identify the factors influencing health insurance coverage among the aging population in Chennai.
- To identify challenges in availing health insurance coverage among the aging population in Chennai

3.2. Hypothesis

- $H0_1$: There is no significant association between socio-economic status (income and Education) and health insurance coverage of the Aging Population.
- H02: There is no significant association between demographic profile and health insurance coverage of the Aging Population
- H03: There is no significant association between Chronic Health Conditions and health insurance coverage of the aging Population.

This cross-sectional study was conducted in Chennai, a metropolitan city in southern India. The study focused on individuals aged 60 and above, given the rapid increase in the elderly population and the low penetration of health insurance in this demographic. The study employed a purposive sampling method, targeting elderly individuals in Chennai. A sample size of 120 respondents was determined to be sufficient for capturing a representative understanding of health insurance coverage among the elderly population in the city. Data were collected from a household survey, wherein the principal investigator conducted face-to-face interviews with the respondents. The interview schedule was designed to gather information on demographic details, health status, health insurance coverage, reasons for being uninsured, and healthcare utilization patterns. Frequency Analysis is used to summarize the distribution of health insurance coverage and other variables. Chi-square tests were used to identify factors associated with health insurance coverage. The chosen sampling method might not be representative of the entire aging population in Chennai, which is a limitation of the study

4. Findings of The Study

Table 1: Health Insurance Coverage Based on Demographic Profile

Variables	Percent of Respondents	Insured	Non-Insured
1. Age			
-> 60-69	55.80%	52.23%	47.76%
-> 70-79	27.50%	51.51%	48.48%
-> 80 or older	16.70%	55%	45%
2. Gender			
-> Male	50%	60%	40%
-> Female	50%	45%	55%
3. Marital Status			
->Married	80.80%	53.60%	46.39%

->Unmarried	19.20%	47.82%	52.17%

This table presents insights into the insurance status of an aging population based on three key demographic variables: age, gender, and marital status. The highest proportion of respondents (55.8%) falls in the 60-69 age group, followed by 70-79 (27.5%) and 80+ (16.7%). Insurance coverage is relatively consistent across age groups, with slightly higher coverage in the 80+ category (55% insured vs. 45% uninsured). The survey is evenly split between male and female respondents (50% each). A higher percentage of males (60%) are insured compared to females (45%). A significant majority of respondents (80.8%) are married, while only 19.2% are unmarried. Married individuals have a higher insurance coverage rate (53.6%) compared to unmarried individuals (47.82%). The study surveyed 120 elderly individuals, with a majority of them being dependent on their offspring (70%).

Table 2: Health Insurance Coverage Based on Socio-Economic Factors

Variables	Percent of Respondents	Insured	Non-Insured
4. Educational Background			
-> Up to Diploma	46.70%	35.17%	64.28%
->Graduate	29.20%	68.50%	31.42%
->Post-Graduate	18.30%	59.09%	40.90%
->Doctorate	5.80%	85.71%	14.28%
5. Annual Income Range			
-> <100000	21.70%	38.46%	61.53%
-> 101000 - 200000	14.20%	52.94%	47.05%
-> 201000 - 300000	26.70%	59.37%	40.62%
-> 301000 - 400000	18.80%	57.89%	42.10%
-> >500000	21.70%	53.84%	46.15%

This data provides insights into the relationship between educational background and annual income range with health insurance coverage. Key observation reveals that higher education levels correlate with higher insurance coverage. Among the 5% respondents who were doctorate holders, 85.71% have insurance coverage. Nearly 46.70% respondents were diploma holders, with the lowest coverage at 35.71%. Insurance coverage is more or less the same across various income groups, though respondents with less than 1,00,000 annual income have the lowest health insurance coverage (38.46%).

Table 3: Health Insurance Coverage among Respondents with Chronic Health Conditions

Variable	Insured	Non-Insured
Elders with Chronic health conditions	51%	33%
Elders without Chronic health conditions	49%	67%

Chronic Health Issues and Insurance Coverage - A substantial 58% of respondents reported suffering from chronic health issues, such as diabetes, hypertension, or cardiovascular diseases. However, only 51% of this group had health insurance, indicating a concerning gap in coverage among those who are most in need of healthcare services.

Table 4: Reasons For Being Insured

Reasons	Being Insured
High Treatment Cost	48%
Due to Financial Planning	28%
Effect of Pandemic	16%
Inadequate existing insurance cover	8%

A significant majority (48%) cited high treatment costs as the primary reason for seeking health insurance. This underscores the growing concern among the elderly regarding the financial burden of medical care, especially as age-related illnesses tend to require frequent and sometimes prolonged treatment. Another 28% of respondents indicated that their decision was driven by financial planning. This suggests a proactive approach among a substantial segment of the population, who view health insurance as an essential component of managing future financial risks associated with healthcare needs. The impact of the COVID-19 pandemic was also a noteworthy factor, influencing 16% of participants. This reflects the heightened awareness of health vulnerabilities and the importance of being insured against unforeseen medical emergencies brought to the forefront by the global health crisis. Lastly, 8% of the aging respondents chose to be insured due to inadequate existing insurance coverage, indicating that their previous policies may not have met their evolving healthcare needs with age.

Table 5: Reasons for Being Uninsured

Reasons	Being Uninsured
Lack of Awareness	39%
Financial Constraints	25%
Reliance on Public Healthcare	17%
Perceived lack of need	19%
Difficulties in accessing insurance products	0%

Among the uninsured respondents, the primary reason cited for the lack of coverage was lack of awareness about health insurance options, accounting for 39% of the cases. Other reasons included financial constraints (25%), perceived lack of need, and difficulties in accessing insurance products

Table 6: Results of Chi-Square Analysis

Independent variable	Dependent Variable	p-value	Null Hypothesis (Accept / Reject)
1. Socio-Economic			
-> Income Range	HIC	0.574	Accepted
-> Educational Background	HIC	0.004	Rejected
2. Demographic			
-> Age	HIC	0.968	Accepted
-> Gender	HIC	0.100	Accepted

-> Marital Status	HIC	0.618	Accepted
3. Factors			
-> Chronic Health Conditions	HIC	0.038	Rejected

The above table reveals the relation between socio-economic factors and health insurance coverage. No significant association was found between income levels and health insurance coverage. This suggests that in the elderly population studied, income differences are not influence whether they possess health insurance. Possibly subsidies, government-sponsored schemes, or family support may play a larger role than personal income. However, education appears to influence HIC ($p = 0.004$, null rejected). A significant association was observed. Elderly individuals with higher educational attainment are more likely to be covered by insurance, possibly due to better awareness and financial literacy. With regard to demographic factors, HIC does not differ across age groups within the elderly. This indicates uniformity of access or barriers, regardless of whether individuals are 'younger-old' or 'older-old'. Also, insurance coverage among elderly males and females, both married & unmarried, seems broadly similar. This could reflect that collective gender disparities, if any, have reduced due to universal or family-based coverage models and families adopting collective decisions. Aging individuals with chronic health conditions are more likely to have insurance coverage. Alternatively, insurers may target individuals already in treatment pathways, or families may prioritize covering those with greater health needs.

5. Discussion

The findings revealed that only 52.5% of the elderly respondents had health insurance coverage. Of those insured, 56% were covered by private health insurance, with the majority (60%) of these policies being employee-sponsored plans for their children. This suggests that a significant portion of the insured elderly population relies on health coverage acquired by their children. The study is limited by its focus on the elderly population in Chennai, which may not fully capture the diversity of the Indian aging population. Chennai, being a metropolitan city with relatively healthy insurance infrastructure, higher literacy levels, and wider penetration of health insurance schemes, both government and private, may present findings that differ from smaller towns, rural regions, or states with lower health coverage. A comparative analysis across multiple cities could help identify region-specific determinants and strengthen the generalizability of findings for policy making at the national level. Therefore, the study suggests an inclusive model of health insurance coverage across the country, which may be adopted by future empirical studies.

5.1. Healthcare utilization

Despite the low levels of insurance coverage, 70% of the respondents reported regularly utilizing healthcare services, including routine checkups and outpatient department (OPD) care. This indicates a high level of healthcare engagement among the elderly, despite the financial barriers posed by the lack of insurance. The study highlights several critical issues related to health insurance coverage among the aging population in Chennai. The low penetration of health insurance, particularly among those with chronic health conditions, points to a significant gap in the healthcare safety net for the elderly, as stated in previous studies (Pathak et al., 2023). The findings suggest that a lack of awareness is a major barrier to insurance coverage, underscoring the need for targeted educational campaigns as pointed out in previous literature (Agarwal et al., 2020). Moreover, the reliance on employee-sponsored insurance plans among the insured elderly suggests that health coverage is often tied to formal employment, leaving many without adequate protection in retirement. This underscores the need for more accessible and affordable insurance options tailored to the needs of the aging population.

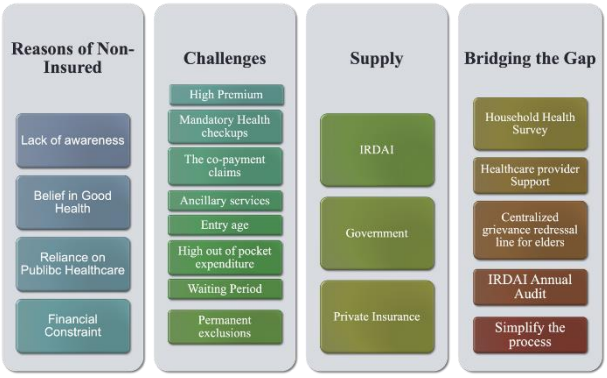

Fig. 1: Reasons for Non-Insurance.

5.2. Reasons for non-insured

The reasons for non-insurance among the elderly population primarily revolve around five major factors: lack of awareness, belief in good health, reliance on public healthcare, financial constraints, and the absence of a perceived need for insurance. Many older adults remain uninsured due to a lack of information about available insurance schemes or because they trust in their current good health and therefore do not see the need for insurance. Additionally, a significant portion of the population relies on public healthcare services, assuming it will suffice for their needs, while others face financial barriers that make insurance premiums unaffordable.

5.3. Challenges in health insurance coverage

The challenges within the health insurance industry exacerbate the issue of underinsurance among the elderly. High premiums, mandatory health checkups, and co-payment requirements are significant deterrents for many older adults. Other barriers include restrictive entry ages, ancillary services that are not covered, high out-of-pocket expenditures, and long waiting periods for claim processing. Permanent exclusions in coverage, such as for pre-existing conditions, further discourage the elderly from seeking insurance, as they fear the policies will not cover their most pressing health needs.

5.4. Supply-side dynamics

On the supply side, the key players are the Insurance Regulatory and Development Authority of India (IRDAI), the government, and private insurance providers. IRDAI plays a crucial role in regulating the industry and ensuring fair practices, while government initiatives and private insurance companies offer various health insurance schemes. However, despite the presence of these institutions, the reach and effectiveness of these schemes remain limited, particularly in rural areas where the need is greatest. The study suggests the expansion of private insurance networks through third-party administrators (TPAs), along with generating financial awareness among the elderly (Chatterjee et al., 2022).

5.5. Bridging the gap

- The Government should conduct a household health survey once in two years to identify and categorize the senior population's health needs and cover the aging population under health insurance.
- IRDAI should conduct an audit of insurance companies, which will ensure transparency and build confidence among the geriatric population for taking health policies.
- Centralized grievance redressal for policyholders (helpline numbers for the geriatric population) can help in timely addressing of policyholders' grievances.
- The IRDAI should provide guidelines on specific policies for the geriatric population where relaxation in the high premium, entry age, waiting period, etc., can be granted.
- IRDAI should encourage hospitals to offer health policies to geriatric patients to facilitate timely care for the needy

6. Future Trends

Growing use of digital platforms will make it easier for the elderly to enroll, renew, and manage insurance claims. Telemedicine coverage within insurance packages will also become more common. Future insurance schemes may increasingly cover preventive check-ups, wellness programs, and lifestyle management, encouraging proactive rather than reactive healthcare among the elderly. As demand grows, private insurers may introduce innovative offerings such as family floater plans covering elderly parents and disease management support. With increasing education and financial literacy among future elderly cohorts, awareness of insurance benefits will rise, potentially improving early adoption before chronic conditions set in.

7. Conclusion

The study provides valuable insights into the state of health insurance coverage among the aging population in Chennai. The low levels of insurance penetration, especially among those with chronic health conditions, highlight the urgent need for policy interventions aimed at increasing coverage. By implementing the proposed model, insurance providers and policymakers can help bridge the coverage gap and ensure better healthcare outcomes for the elderly population

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Data Availability Statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Conflict of Interest Statement

The authors declare that there is no conflict of interest related to this study.

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