Vol. 6, Issue 2, Feb 2018, 125-134
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# PREVALENCE OF CHRONIC DISEASES AND UTILIZATION OF HEALTH CARE AMONG ADULTS, INDIA 

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Received: 23 Jan 2018
Accepted: 27 Jan 2018
Published: 13 Feb 2018


#### Abstract

The objective of this paper is to study the chronic diseases prevalence with selected characteristics of adults and their utilization of health care. For this study, 'Global Aging and Adult Health' (SAGE) data has been used. SAGE is a longitudinal study with the national representative group of aged 50 and older with comparison samples of younger adults aged 18-49 years in the country. To analyse the data, descriptive and bi-variety analysis was used. Findings reveal that prevalence of the symptom-based chronic diseases was higher among older people, illiterates and poor adults. The female respondents were more likely to suffer from undiagnosed arthritis, angina and depression as compared to males. Respondents who were currently economically productive were more likely to report for chronic diseases.


KEYWORDS: Chronic Diseases, Adults, Characteristics, Utilisation, Health Care, India

## INTRODUCTION

The chronic diseases have a multidimensional impact on the community as well as on the individual, and require a lot of healthcare resources for their management. The high prevalence of chronic diseases has long term unfavourable implications on physical, mental health and financial condition of adults. India while struggling with the unfinished agenda of its communicable diseases, is also experiencing rapid rise in the prevalence of chronic diseases (Mahal et al, 2010) like many other developing countries. Over the past few decades, the rising burden of chronic diseases has emerged as the leading cause of death in the world (WHO 2011). Nearly $60 \%$ of all deaths are caused by chronic ailments such as heart disease, stroke, hypertension, diabetes chronic respiratory disease and depression. It was estimated that around $53 \%$ of the total deaths in India were attributed to the non-communicable diseases (Reddy KS et al, 2005). Cardiovascular disease alone account for 24 percent of all deaths. Chronic respiratory disease, cancer and diabetes accounted for 11, six and two percent of all deaths, respectively (WHO, 2012; NCD country profiles, 2011). Ageing will result in an increased burden of chronic diseases, reduced levels of physical functioning, and increased disability, leading to increased medical care and healthcare expenditures. Studies show that the people with low income/socio-economic status (SES) have more health related problems than people with high SES (Syed et al, 2006). Health service utilization is a complex behavioural phenomenon, related to the availability, quality, cost and comprehensiveness of services as well as sociocultural structure, health beliefs and personal characteristics of the users [Solome B, Sarab W et al, 2009]. Evidences have documented that adult population are more vulnerable to various chronic diseases. Nearly half ( $45 \%$ ) of India's disease burden is projected to be borne by older adults by 2030 (Chatterji et al 2008). Usually people from low socio economic
background have symptoms of chronic diseases, but they did not seek any treatment as they fail to realize the presence of an ailment. In this context, the study made an attempt to assess the prevalence of chronic diseases and health-seeking behaviour for self-reported chronic conditions in general.

## OBJECTIVES

The objective of this paper is to study the chronic diseases prevalence with selected characteristics of adults and their utilization of health care.

## DATA AND METHODOLOGY

This paper is based on the data of Study on Global Aging and Adult Health (SAGE). SAGE was implemented (2007-2008) by International Institute for Population science and the samples were selected nationally using a multistage stratified design as to allow each individual household respondents aged 50 and above to compare the samples of younger adults aged 18-49 years in the country. The study is about health and health-related outcomes and their determinants. The data has been collected in rural and urban areas representing the geographical, economic, demographic variations in the country. Such as Assam, Karnataka, Maharashtra, Rajasthan, Uttar Pradesh, and West Bengal Information collected for both in-patients and out-patients on selected chronic diseases, like arthritis, angina, lung disease, asthma and depression and hypertension with the help of a questionnaire consisting questions some specific questions like "Have you ever been diagnosed with/told that you have disease name?, and for treatment seeking, regarding medication questions are asked a) Have you been taking medications or other treatment for it during the last 2 weeks, b) Have you been taking medications or other treatment for it during the last 12 months?

## RESULTS OF THE STUDY

Table 1 shows the percentage share of background characteristics of respondents. Regarding age of the respondents, 41 percent belong to $18-49$ years age group, and nearly 59.0 percent belong to above 50 years age group. Among the total respondents, high proportion ( 75 percent) belongs to rural areas. About 45 percent have no formal education, followed by primary schooling 26 percent, secondary schooling-12.4 percent, and higher secondary and above education is 16 percent. Coming to gender variation among total respondents, 38.7 percent are male and $61.2 \%$ of respondents are females. Households in the poorest wealth quintile are 37 percent, medium wealth quintile are 19 percent and 44 percent in rich wealth quintile. Almost 80 percent of the respondents are currently economically productive. Regarding to marital status of the respondents, nearly 78 percent are currently married, 16 percent widows, 6 percent divorced and single. With regard to religion high proportions ( 84 percent) of respondents are Hindus, and 12 percent are Muslims. On the other hand, 75 percent respondents are from other backward classes followed by Scheduled caste $18 \%$ and 7 percent from scheduled tribes.

Table 2 reveals the percentage distribution of adults who have diagnosed and undiagnosed for chronic disease in the last 12 months and their background characteristics. About 13 percent of respondents reported with angina disease out of them only 3 percent respondents have been diagnosed. With regard to lung diseases, 10 percent are identified among which only 3 percent have been diagnosed. About 15 percent reported symptom based arthritis out of them only 10 percent have diagnosed.

Table 3 reveals the percentage distributions of the adults reported symptom based chronic diseases who have
sought the health care facility during the last 12 months by background characteristics. Less than 50 percent respondents have diagnosed for the symptom based selected chronic disease. The utilization of health care was higher among widowed/widowers respondents for symptom based arthritis (55\%), angina ( $21 \%$ ), hypertension ( $22 \%$ ) whereas divorced/separated respondents reported more for symptom based asthma (67\%). With the improvement in the wealth status, the utilization of the health care increased for symptom based chronic disease. A large proportion of the respondents belonging to the economically well off households have sought health care facility for symptom based arthritis (53\%), angina (28\%), chronic lung disease (17\%) and depression (22\%). Analysing by states reveals that in West Bengal, a higher proportion of respondents visited health care for symptom based arthritis (61\%) compared to other states. Similarly in Karnataka, a higher proportion of the respondents have sought health care for symptom based angina (40\%) and chronic lung disease ( $31 \%$ ). Seven percent of the respondents have sought health care for symptom based depression, 12 percent hypertension, 15 percent chronic lung disease, 19 percent angina, 39 percent asthma, and 52 percent arthritis. In rural areas, less proportion of the respondents have sought health care for the symptom based chronic diseases as compared to the urban areas except for depression. The proportion of respondents who utilised health care is higher among educated respondents. $56 \%$ of the respondents with high school and above education used health care for symptom based arthritis; $30 \%$ for angina; $24 \%$ for chronic lung disease and $14 \%$ for hypertension.

Table 4 shows the logistic regression of adults in India for the prevalence of selected chronic disease by background characteristics. Older age is associated with the increased prevalence of morbidities as with the increase of age. The prevalence of asthma ( 3.7 times), hypertension ( 3.01 times), diabetes ( 3.5 times), arthritis ( 3 times), and angina ( 2.6 times) is more likely to occur among the elderly population as compared to the adult population. Study shows that females are more vulnerable for arthritis and hypertension as the odd ratios for these diseases are 1.24 and 1.56 times higher for females as compared to males respectively. Among respondents in the age group of $70+$ are more likely to suffer from chronic diseases as compared to the adult population (18-49 years age group). Further, the likelihood of reporting to chronic lung disease was less among the schedule caste respondents. Respondents of other backward class and others caste group were more likely to report arthritis ( 1.34 times) as compared to the respondents belonging to scheduled tribe or caste. Respondents who were currently economically productive were more likely to reports for chronic diseases: arthritis ( 1.28 times), angina ( 1.46 times), diabetes ( 1.5 times), chronic lung disease ( 2 times), asthma ( 2 times) and hypertension ( 1.60 times) as compared to the respondents who were not working. The reason for this paradoxical finding could be the difference in the awareness level of respondents that shaped the attitude and perception about morbidities among the individuals. Comparing the currently married respondents, the divorced/separated and single respondents were less likely to suffer from chronic arthritis ( 0.54 times), diabetes ( 0.48 times) and hypertension ( 0.5 times). The odds of higher prevalence arthritis (4 times), angina (7 times) and depression (3times) were reported in Karnataka state. In Maharashtra the odds of the prevalence of diabetes was reported higher. The likelihood of reported chronic lung disease (6 times) was higher in Utter Pradesh as compared to Assam state. In West Bengal, the odds of having arthritis (2 times), angina ( 3 times), chronic lung disease ( 3 times) were reported higher compared to Assam state. Findings revealed that the prevalence of diabetes and hypertension increased, whereas the prevalence of asthma and chronic lung disease decreased with the improvement in the wealth status of the households. For instance, the respondents belonging to the rich wealth quintile were more likely to suffer from diabetes ( 2.2 times) and hypertension ( 3 times) while the prevalence of chronic lung disease, and asthma was quite less as compared to the respondents belonging to the lowest
wealth quintile.
Table 5 present the logistic regression for undiagnosed symptom based chronic diseases among adults in India. For instance, the oldest population compared to younger older is two times more likely to suffer from depression, 1.8 times from chronic lung disease; 1.7 times from arthritis and 1.6 times from angina and hypertension. The female respondents were more likely to suffer from undiagnosed arthritis, angina and depression as compared to males. Respondents residing in rural areas were less likely to suffer from angina and chronic lung disease undiagnosed chronic diseases (except hypertension) as compared to their urban counterpart consistency with the results of table 3, the likelihood of reported undiagnosed symptom based chronic disease was lower among the educated respondents. For instance, the respondents with education of high school and above were less likely to suffer from undiagnosed symptom based arthritis ( 0.5 times), angina ( 0.4 times), chronic lung disease ( 0.7 times), asthma ( 0.6 times), depression ( 0.7 times), hypertension ( 0.8 times) as compared to illiterate respondents. Comparison with currently married respondents widowed/widowers respondents have more likely to suffer from undiagnosed symptoms based chronic disease depression, hypertension that is 1.2 times higher, whereas divorced/separated/single respondents were less likely to suffer from undiagnosed symptom base arthritis chronic disease. The likelihood of undiagnosed symptoms based chronic diseases declined with the improvement in the economic status of the household. For instance, the respondents belonging to the richest wealth were less likely to suffer from undiagnosed symptom based angina ( 0.5 times), chronic lung disease ( 0.6 times), depression ( 0.4 times), hypertension ( 0.8 times) as compared to the lowest wealth quintile respondents. Compared with Assam state, the likelihood of those reported symptom based undiagnosed depression disease was 11 times higher in Karnataka as well as Utter Pradesh, five times in Rajasthan, two times in Maharashtra, three times in West Bengal states. Furthermore, the likelihood of those reported undiagnosed symptom based angina and chronic lung disease were less in the given states compared to Assam.

## CONCLUSIONS

The study reveals that prevalence of symptom based chronic diseases was higher among older people, illiterates and poor adults. Similarly, prevalence of symptom based chronic diseases is higher when compared to diagnosed diseases. A large proportion of the illiterate and poor adults are more vulnerable to undiagnosed diseases. Older population in the age group of ( $70+$ years) were more likely to suffer with undiagnosed chronic diseases, compared to the younger adults (18 to 49 years). Prevalence of chronic diseases is higher among rich people.

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## APPENDICES

Table 1: Percent Distribution of Respondents by Background Characteristics

| Background Characteristics | Percent | Number of Respondents |
| :--- | :---: | :---: |
| Age |  |  |
| $18-49$ | 41.6 | 4670 |
| $50-59$ | 26.2 | 2939 |
| $60-69$ | 19.9 | 2235 |
| 70 and Above |  | 1386 |
| Sex | 38.73 | 4349 |
| Male | 61.27 | 6881 |
| Female | 25.3 | 2845 |
| Place of Residence | 74.7 | 8385 |
| Urban |  |  |
| Rural | 45.4 | 5080 |
| Education attainment | 25.8 | 2894 |
| Illiterate | 12.4 | 1395 |
| Up to Primary school | 16.6 | 1861 |
| Up to Secondary School |  | 8715 |
| Higher secondary and Above | 1814 |  |
| Marital Status | 77.6 | 700 |
| Currently Married | 16.2 |  |
| Widowed | 6.2 | 9439 |
| Others* |  | 1384 |
| Religion | 84.1 | 407 |
| Hindu | 12.3 |  |
| Muslim | 3.6 |  |
| Others** |  | 774 |
| Caste | 6.9 | 1978 |
| Scheduled tribes | 17.7 | 8408 |
| Scheduled castes | 75.3 |  |
| Others*** |  |  |
| Work Status |  |  |
|  |  |  |


| Table 1 Contd., |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: |
| Working | 64.2 | 4745 |  |  |
| Not working | 35.8 | 2647 |  |  |
| Wealth quintile |  |  |  |  |
| Lowest | 17.9 | 1992 |  |  |
| Second | 19.2 | 2146 |  |  |
| Middle | 21 | 2136 |  |  |
| Fourth | 22.8 | 2346 |  |  |
| Highest |  | 2539 |  |  |
| States | 10.6 |  |  |  |
| Assam | 13.8 | 1194 |  |  |
| Karnataka | 17.7 | 1553 |  |  |
| Maharashtra | 19.8 | 1983 |  |  |
| Rajasthan | 19.6 | 2225 |  |  |
| Uttar Pradesh | 18.74 | 2201 |  |  |
| Wes Bengal | $\mathbf{1 0 0}$ | 2074 |  |  |
| Total |  |  |  | $\mathbf{1 1 2 3 0}$ |
| Noter Otr\| |  |  |  |  |

Note: Others*: never married, cohabiting, separated/divorced, Others**: Buddhism, Chinese traditional religion, Christianity including Roman Catholic Protestant Orthodox other, Jainism, Judaism, Primal Indigenous, Sikhism) religion, Others***: no schedule caste or no schedule tribe

Table 2: Percentage Distribution of Adults Who Have Diagnosed and Undiagnosed For Chronic Disease in the Last 12 Months and their Background Characteristics

| Background Characteristics | Arthritis |  | Angina |  | Chronic Lung Disease |  | Asthma |  | Depression |  | Hypertension* |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Diagnosed | Undiagnosed | Diagnosed | Undiagnosed | Diagnosed | Undiagnosed | Diagnosed | Undiagnosed | Diagnosed | Undiagnosed | Diagnosed | Undiagnosed |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| 18-49 | 6.6 | 4.4 | 2.3 | 8.1 | 2.3 | 5.3 | 2.4 | 2.5 | 3.2 | 8.1 | 6.9 | 15 |
| 50-59 | 16.6 | 9.5 | 5 | 11.9 | 3.5 | 10.3 | 5.3 | 4.6 | 4 | 15.3 | 15.7 | 19.9 |
| 60-69 | 19.2 | 10.3 | 4.9 | 17 | 4.5 | 14.5 | 8.5 | 5.9 | 4.2 | 18.5 | 16.2 | 23.2 |
| 70 and Above | 20.6 | 9.1 | 7.8 | 17.2 | 6.8 | 15.6 | 9.9 | 6.2 | 4.1 | 20.9 | 21.1 | 22.7 |
| Sex |  |  |  |  |  |  |  |  |  |  |  |  |
| Male | 8.2 | 4.5 | 3.3 | 7.8 | 4.3 | 7.4 | 4.2 | 3.9 | 4.3 | 8.9 | 7.3 | 17.4 |
| Female | 10.8 | 6.9 | 2.9 | 11.5 | 1.5 | 6.6 | 2.9 | 2.6 | 2.5 | 11.9 | 11.6 | 15.8 |
| Residence |  |  |  |  |  |  |  |  |  |  |  |  |
| Urban | 8.9 | 5 | 4.1 | 7.9 | 2.2 | 5.3 | 4.2 | 1.7 | 3.2 | 10.6 | 12.9 | 18.1 |
| Rural | 9.7 | 5.9 | 2.8 | 10.2 | 3.1 | 7.8 | 3.4 | 3.7 | 3.5 | 10.3 | 8.2 | 16.1 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Illiterate | 11.5 | 8.3 | 2.9 | 13.8 | 2.7 | 9.5 | 4.1 | 3.8 | 3 | 14.6 | 9.8 | 18.7 |
| Up to Primary school | 10.7 | 5.8 | 3.1 | 9.3 | 3 | 7.4 | 3.4 | 3.3 | 3.9 | 8.9 | 8 | 18.2 |
| Secondary School | 8.7 | 3.9 | 4.3 | 8.5 | 3.5 | 5 | 2.6 | 2.6 | 2.8 | 8.8 | 8.7 | 12.7 |
| Higher sch. And Above | 5.6 | 2.6 | 2.6 | 4.5 | 2.6 | 4.7 | 3.6 | 2.5 | 3.9 | 6.5 | 11 | 14.1 |
| MaritalStatus |  |  |  |  |  |  |  |  |  |  |  |  |
| Currently Maried | 9.5 | 5.9 | 3.3 | 9.8 | 3.1 | 7.1 | 3.6 | 3.4 | 3.5 | 3.9 | 9.5 | 16.9 |
| Widowed | 17 | 8.9 | 4.2 | 14.7 | 2.7 | 12.2 | 5.5 | 4.1 | 5.3 | 10.4 | 17 | 19.2 |
| Others* | 3 | 1.5 | 0.6 | 4.3 | 1.4 | 3.4 | 2 | 0.7 | 1.5 | 11 | 2.6 | 12.2 |

Table 3: Percentage Distributions of the Adults Reported Symptoms Based Chronic Diseases Who Have Sought the Health Care Facility during the Last $\mathbf{1 2}$ Months by Background Characteristics

| Background <br> Characteristics | Arthritis | Angina | Chronic Lung <br> Disease | Asthma | Depression | Hypertension* |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| Age |  |  |  |  |  |  |
| $18-49$ | 49.9 | 16.8 | 13.9 | 33.5 | 8.0 | 8.0 |
| $50-59$ | 53.3 | 20.2 | 16.0 | 39.5 | 6.8 | 16.8 |
| $60-69$ | 52.8 | 19.2 | 13.5 | 48.6 | 3.8 | 19.3 |
| 70 and Above | 59.0 | 31.0 | 17.4 | 51.8 | 7.9 | 27.1 |
| Sex |  |  |  |  |  |  |
| Male | 52.1 | 21.7 | 18.1 | 36.9 | 7.4 | 11.4 |
| Female | 51.8 | 17.0 | 10.1 | 42.8 | 7.1 | 13.3 |
| Residence |  |  |  |  |  |  |
| Urban | 53.7 | 28.1 | 14.9 | 56.5 | 4.2 | 17.3 |
| Rural | 51.4 | 16.1 | 14.5 | 34.6 | 8.3 | 10.1 |
| Education attainment |  |  |  |  |  |  |
| Illiterate | 47.5 | 14.7 | 12.0 | 42.3 | 4.5 | 9.1 |


| Table 3: Contd., |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Background Characteristics | Arthritis | Angina | Chronic Lung Disease | Asthma | Depression | Hypertension* |
| Up to Primary school | 54.8 | 22.0 | 14.2 | 38.0 | 9.7 | 12.0 |
| Secondary School | 58.4 | 18.3 | 12.9 | 33.0 | 13.8 | 14.7 |
| Higher sch. And Above | 56.0 | 30.0 | 23.6 | 37.8 | 5.7 | 17.2 |
| Marital Status |  |  |  |  |  |  |
| Currently Married | 51.6 | 19.3 | 14.8 | 36.4 | 3.8 | 11.8 |
| Widowed | 55.2 | 20.9 | 10.9 | 48.9 | 2.5 | 22.0 |
| Others* | 45.4 | 8.9 | 22.1 | 69.6 | 0.0 | 1.5 |
| Religion |  |  |  |  |  |  |
| Hindu | 52.4 | 18.9 | 15.7 | 37.3 | 7.2 | 12.2 |
| Muslim | 54.4 | 19.2 | 8.2 | 54.2 | 7.1 | 13.5 |
| Others* | 33.1 | 21.0 | 18.4 | 26.7 | 8.7 | 11.0 |
| Caste group |  |  |  |  |  |  |
| Scheduled tribes | 56.1 | 12.7 | 24.3 | 15.3 | 7.0 | 6.3 |
| Scheduled castes | 40.4 | 7.9 | 13.1 | 13.9 | 7.5 | 10.1 |
| Others*** | 54.2 | 13.4 | 14.4 | 7.8 | 7.2 | 13.6 |
| Work Status |  |  |  |  |  |  |
| Working | 52.0 | 17.8 | 14.3 | 31.7 | 5.5 | 9.4 |
| Not working | 55.7 | 21.4 | 20.3 | 48.6 | 10.3 | 17.8 |
| Wealth quintile |  |  |  |  |  |  |
| Lowest | 43.2 | 13.0 | 12.2 | 39.2 | 7.9 | 4.5 |
| Second | 74.9 | 15.0 | 15.7 | 28.3 | 4.3 | 9.1 |
| Middle | 58.1 | 18.8 | 13.4 | 36.0 | 5.9 | 13.2 |
| Fourth | 60.2 | 27.3 | 16.8 | 49.5 | 10.2 | 11.0 |
| Highest | 53.3 | 28.1 | 16.8 | 47.2 | 9.0 | 22.4 |
| States |  |  |  |  |  |  |
| Assam | 48.0 | 16.1 | 3.9 | 57.1 | 39.7 | 14.6 |
| Karnataka | 78.1 | 40.9 | 30.5 | 52.9 | 10.3 | 15.2 |
| Maharashtra | 58.6 | 13.2 | 11.8 | 32.9 | 6.8 | 9.2 |
| Rajasthan | 19.4 | 10.8 | 14.4 | 38.1 | 2.1 | 6.2 |
| Uttar Pradesh | 34.6 | 18.5 | 18.1 | 37.8 | 4.5 | 10.6 |
| West Bengal | 61.4 | 20.6 | 7.6 | 38.0 | 13.1 | 20.2 |
| Total | 51.9 | 19.1 | 14.6 | 39.3 | 7.2 | 12.3 |

Note: Others*: never married, cohabiting, separated/divorced, Others**: Buddhism, Chinese traditional religion, Christianity including Roman Catholic Protestant Orthodox other, Jainism, Judaism, Primal Indigenous, Sikhism) religion, Others***: no schedule caste or no schedule tribe, Hypertension* disease is Measured

Table 4: Logistic Regression of Prevalence for Selected Chronic Disease by Background Characteristics

| Background Characteristics | Arthritis | Angina | Diabetes | CLD | Asthma | Depression | Hypertension |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Age |  |  |  |  |  |  |  |
| 18-49 |  |  |  |  |  |  |  |
| 50-59 | $\begin{gathered} 2.13 * * * \\ (1.74-2.61) \\ \hline \end{gathered}$ | $\begin{gathered} 1.63 * * * \\ (1.15-2.13) \\ \hline \end{gathered}$ | $\begin{gathered} 2.66 * * * \\ (1.85-3.82) \end{gathered}$ | $\begin{gathered} 1.41^{*} \\ (0.96-2.08) \end{gathered}$ | $\begin{gathered} 2.28 * * * \\ (1.62-3.22) \\ \hline \end{gathered}$ | 1.17 | $\begin{gathered} 2.03 * * * \\ (1.64-2.51) \\ \hline \end{gathered}$ |
| 60-69 | $\begin{gathered} 2.82 * * * \\ (2.26-3.52) \end{gathered}$ | $\begin{gathered} 1.69 * * * \\ (1.14-2.4) \end{gathered}$ | $\begin{gathered} 3.32 * * * \\ (2.25-4.90) \end{gathered}$ | $\begin{gathered} 1.53 * * \\ (1.01-2.31) \end{gathered}$ | $\begin{gathered} 3.36 * * * \\ (2.37-4.77) \end{gathered}$ | 0.96 | $\begin{gathered} 2.18 * * * \\ (1.71-2.77) \end{gathered}$ |
| 70 and Above | $\begin{gathered} 2.93 * * * \\ (2.25-3.81) \\ \hline \end{gathered}$ | $\begin{gathered} 2.65 * * * \\ (1.73-4.04) \\ \hline \end{gathered}$ | $\begin{gathered} 3.51 * * * \\ (2.26-5.45) \\ \hline \end{gathered}$ | $\begin{gathered} 1.58^{*} \\ (0.99-2.52) \\ \hline \end{gathered}$ | $\begin{gathered} 3.64 * * * \\ (2.46-5.38) \\ \hline \end{gathered}$ | 1.02 | $\begin{gathered} 3.01 * * * \\ (2.28-3.97) \\ \hline \end{gathered}$ |
| Sex |  |  |  |  |  |  |  |
| Male |  |  |  |  |  |  |  |
| Female | $\begin{gathered} 1.24 * * \\ (1.04-1.48) \\ \hline \end{gathered}$ | 0.89 | $\begin{gathered} .64 * * * \\ (0.47-0.87) \\ \hline \end{gathered}$ | $\begin{gathered} 0.32 * * * \\ (0.22-0.46) \\ \hline \end{gathered}$ | $\begin{gathered} 0.62 * * * \\ (0.48-0.82) \\ \hline \end{gathered}$ | $\begin{gathered} 0.37 * * * \\ (0.27-0.52) \\ \hline \end{gathered}$ | $\begin{gathered} 1.56 * * * \\ (1.29-1.89) \\ \hline \end{gathered}$ |
| Residence |  |  |  |  |  |  |  |
| Urban |  |  |  |  |  |  |  |
| Rural | $\begin{gathered} 0.72 * * * \\ (0.60-0.87) \\ \hline \end{gathered}$ | $\begin{gathered} 1.34 * * \\ (1.01-1.77) \\ \hline \end{gathered}$ | $\begin{gathered} 1.54 * * * \\ (1.20-1.96) \\ \hline \end{gathered}$ | 0.99 | 1.11 | $\begin{gathered} 0.72^{*} \\ (0.52-1.01) \\ \hline \end{gathered}$ | $\begin{gathered} 1.22 * * \\ (1.03-1.45) \end{gathered}$ |
| Education |  |  |  |  |  |  |  |
| Illiterate |  |  |  |  |  |  |  |
| Up to Primary school | 1.02 | $\begin{gathered} 1.55 * * * \\ (1.13-2.12) \\ \hline \end{gathered}$ | 1.3 | 1.23 | 1.19 | $\begin{gathered} 0.73^{*} \\ (0.52-1.01) \\ \hline \end{gathered}$ | 1.18 |
| Secondary School | 0.95 | $\begin{gathered} 1.51^{*} \\ (0.99-2.31) \end{gathered}$ | $\begin{gathered} 1.76 * * * \\ (1.19-2.6) \\ \hline \end{gathered}$ | 1.41 | 1.21 | $\begin{gathered} 0.66^{*} \\ (0.42-1.06) \end{gathered}$ | $\begin{gathered} 1.59 * * * \\ (1.22-2.07) \end{gathered}$ |
| Higher school and Above | $\begin{gathered} 0.79^{*} \\ (0.60-1.03) \end{gathered}$ | 1.05 | $\begin{gathered} 2.17 * * * \\ (1.5-3.15) \\ \hline \end{gathered}$ | 0.93 | 0.75 | $\begin{gathered} 0.65^{*} \\ (0.42-1.01) \\ \hline \end{gathered}$ | $\begin{gathered} 1.86^{* * *} \\ (1.44-2.41) \\ \hline \end{gathered}$ |
| Religion |  |  |  |  |  |  |  |
| Hindu |  |  |  |  |  |  |  |
| Muslim | 1.14 | 1.14 | $\begin{gathered} 1.41^{*} \\ (0.99-2.0) \\ \hline \end{gathered}$ | $\begin{gathered} 0.63^{*} \\ (0.39-1.0) \\ \hline \end{gathered}$ | $\begin{gathered} 1.32^{*} \\ (0.96-1.81) \\ \hline \end{gathered}$ | 1.02 | $\begin{gathered} 1.54 * * * \\ (1.21-1.95) \\ \hline \end{gathered}$ |
| Others ${ }^{\text {b }}$ | 0.87 | 1.14 | 1.14 | 1.06 | 0.68 | 0.78 | 1.09 |
| Caste group |  |  |  |  |  |  |  |
| Scheduled tribes |  |  |  |  |  |  |  |
| Scheduled castes | 1.05 | 1.25 | 0.87 | $\begin{gathered} 0.60^{*} \\ (0.35-1.03) \\ \hline \end{gathered}$ | 0.97 | 0.73 | 1.22 |
| Others ${ }^{\text {c }}$ | $\begin{gathered} 1.34^{*} \\ (1.0-1.79) \\ \hline \end{gathered}$ | 1.21 | 1.46 | 0.70 | 0.92 | 0.91 | 1.26 |
| Working Status |  |  |  |  |  |  |  |
| Yes working |  |  |  |  |  |  |  |
| Not working | $\begin{gathered} 1.28 * * * \\ (1.09-1.50) \\ \hline \end{gathered}$ | $\begin{gathered} 1.46 * * * \\ (1.12-1.90) \\ \hline \end{gathered}$ | $\begin{gathered} 1.54 * * * \\ (1.20-1.98) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 2.06 * * * \\ (1.54-2.76) \\ \hline \end{gathered}$ | $\begin{gathered} 1.93 * * * \\ (1.54-2.42) \\ \hline \end{gathered}$ | 1.05 | $\begin{gathered} 1.60^{* * *} \\ (1.35-1.88) \\ \hline \end{gathered}$ |
| Wealth quintile |  |  |  |  |  |  |  |
| Lowest |  |  |  |  |  |  |  |
| Second | 0.93 | 0.89 | 1.08 | 0.79 | 0.96 | 1.06 | 1.22 |
| Middle | 1.16 | 0.83 | $\begin{gathered} 1.63 * * \\ (1.04-2.56) \\ \hline \end{gathered}$ | 0.76 | 0.88 | 1.24 | $\begin{gathered} 1.77 * * * \\ (1.34-2.34) \\ \hline \end{gathered}$ |
| Fourth | 1.01 | 0.87 | $\begin{gathered} 1.85 * * * \\ (1.20-2.87) \end{gathered}$ | $\begin{gathered} 0.66^{*} \\ (0.43-1.01) \\ \hline \end{gathered}$ | $\begin{gathered} 0.71 * * \\ (0.50-0.10) \\ \hline \end{gathered}$ | $\begin{gathered} 1.54 * * \\ (1-2.35) \\ \hline \end{gathered}$ | $\begin{gathered} 2.29 * * * \\ (1.73-3.01) \\ \hline \end{gathered}$ |
| Highest | 0.93 | 1.25 | $\begin{gathered} 2.17 * * * \\ (1.38-3.42) \end{gathered}$ | $\begin{gathered} 0.49 * * * \\ (0.30-0.78 \end{gathered}$ | $\begin{gathered} 0.64 * * \\ (0.44-0.94) \end{gathered}$ | 1.13 | $\begin{gathered} 3 * * * \\ (2.25-4.01) \end{gathered}$ |
| States |  |  |  |  |  |  |  |
| Assam |  |  |  |  |  |  |  |


| Table 4: Contd., |  |  |  |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Background <br> Characteristics | Arthritis | Angina | Diabetes | CLD | Asthma | Depression | Hypertension |
| Karnataka | $3.52^{* * *}$ <br> $(2.55-4.87)$ | $6.53^{* * *}$ <br> $(3.22-$ <br> $13.22)$ | $2.43 * * *$ <br> $(1.44-4.11)$ | $3.47 * * *$ <br> $(1.59-7.63)$ | 1.25 | $2.74^{* * *}$ <br> $(1.79-4.18)$ | 0.82 |
| Maharashtra | $2.08^{* * *}$ <br> $(1.50-2.88)$ | $2.77^{* * *}$ <br> $(1.35-5.70)$ | $2.51^{* * *}$ <br> $(1.50-4.20)$ | 1.7 | 1.09 | $0.47^{* * *}$ <br> $(0.28-0.78)$ | 0.84 |
| Rajasthan | $0.35^{* * *}$ <br> $(2.4-0.51)$ | 1.02 | 0.69 | $3.17 * * *$ <br> $(1.48-6.78)$ | 0.87 | $0.1^{* * *}$ <br> $(0.05-0.21$ | $0.45^{* * *}$ <br> $(0.33-0.62)$ |
| Uttar Pradesh | 0.82 | $3.17^{* * *}$ <br> $(1.54-6.53)$ | 1.18 | $5.91^{* * *}$ <br> $(2.79-12.5)$ | 1.12 | $0.23^{* * *}$ <br> $(0.38-0.1)$ | $0.56^{* * *}$ <br> $(0.41-0.76)$ |
| West Bengal | $2.12 * * *$ <br> $(1.53-2.92)$ | $3.09^{* * *}$ <br> $(1.51-6.33)$ | 1.96 | $2.51^{* *}$ <br> $(1.16-5.45)$ | 0.78 | $0.61^{* *}$ <br> $(0.38-0.99)$ | 1.09 |
| Nb: On |  |  |  |  |  |  |  |

Note: Others ${ }^{\text {b }}$ : Buddhism, Chinese traditional religion, Christianity including Roman Catholic Protestant Orthodox other, Jainism, Judaism, Primal Indigenous, Sikhism) religion, Others ${ }^{\text {c }}$ : no schedule caste or no schedule tribe; Significance Level: ${ }^{* * *} \mathrm{p}<0.01, * * \mathrm{p}<0.05$, ${ }^{*} \mathrm{p}<0$

Table 5: Logistic Regression of Undiagnosed Chronic Disease by Background Characteristics

| Background Characteristics | Arthritis | Angina | Chronic Lung Disease | Asthma | Depression | Hypertension |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Age |  |  |  |  |  |  |
| 18-49 |  |  |  |  |  |  |
| 50-59 | $\begin{gathered} 1.94 * * * \\ (1.52-2.48) \end{gathered}$ | $\begin{gathered} 1.39 * * * \\ (1.12-1.74) \end{gathered}$ | $\begin{gathered} 1.69 * * * \\ (1.34-2.13) \end{gathered}$ | $\begin{gathered} 1.5 * * \\ (1.09-2.07) \end{gathered}$ | $\begin{gathered} 1.71 * * * \\ (1.39-2.09) \end{gathered}$ | $\begin{gathered} 1.61 * * * \\ (1.38-1.89) \end{gathered}$ |
| 60-69 | $\begin{gathered} 1.87 * * * \\ (1.43-2.46) \\ \hline \end{gathered}$ | $\begin{gathered} 1.85 * * * \\ (1.46-2.34) \end{gathered}$ | $\begin{gathered} 1.96 * * * \\ (1.53-2.51) \\ \hline \end{gathered}$ | $\begin{gathered} 1.56 * * \\ (1.10-2.21) \\ \hline \end{gathered}$ | $\begin{gathered} 2.03 * * * \\ (1.63-2.53) \end{gathered}$ | $\begin{gathered} 1.54 * * * \\ (1.29-1.84) \\ \hline \end{gathered}$ |
| 70 and Above | $\begin{gathered} 1.69^{* * *} \\ (1.21-2.37) \end{gathered}$ | $\begin{gathered} 2.19^{* * *} \\ (1.64-2.91) \end{gathered}$ | $\begin{gathered} 2.43 * * * \\ (1.83-3.23) \end{gathered}$ | $\begin{gathered} 1.93 * * * \\ (1.30-2.88) \end{gathered}$ | $\begin{gathered} 2.54 * * * \\ (1.96-3.28) \end{gathered}$ | $\begin{gathered} 1.62^{* * *} \\ (1.30-2.02) \end{gathered}$ |
| Sex |  |  |  |  |  |  |
| Male |  |  |  |  |  |  |
| Female | $\begin{gathered} 1.29 * * \\ (1.04-1.60) \end{gathered}$ | $\begin{gathered} 1.55 * * * \\ (1.28-1.88) \end{gathered}$ | $\begin{gathered} 0.74 * * * \\ (0.61-0.90) \end{gathered}$ | $\begin{gathered} 0.64 * * * \\ (0.49-0.85) \end{gathered}$ | $\begin{gathered} 1.36^{* * *} \\ (1.14-1.62) \end{gathered}$ | $\begin{gathered} 0.77 * * * \\ (0.66-0.89) \end{gathered}$ |
| Residence |  |  |  |  |  |  |
| Urban |  |  |  |  |  |  |
| Rural | 0.88 | $\begin{gathered} 0.78 * * \\ (0.62-0.98) \end{gathered}$ | $\begin{gathered} 0.73 * * * \\ (0.58-0.91) \end{gathered}$ | 0.78 | 0.9 | 1.09 |
| Education |  |  |  |  |  |  |
| Illiterate |  |  |  |  |  |  |
| Up to Primary school | 0.84 | $\begin{gathered} 0.84^{*} \\ (068-1.03) \end{gathered}$ | 0.92 | 0.99 | 1.08 | $\begin{gathered} 0.75 * * * \\ (0.64-0.88) \end{gathered}$ |
| Secondary School | $\begin{gathered} 0.74 * \\ (0.52-1.03) \\ \hline \end{gathered}$ | $\begin{gathered} 0.68 * * \\ (0.5 .-0.92) \end{gathered}$ | $\begin{gathered} 0.52 * * * \\ (0.37-0.72) \end{gathered}$ | $\begin{gathered} 0.51 * * * \\ (0.31-0.82) \\ \hline \end{gathered}$ | 0.84 | $\begin{gathered} 0.7 * * * \\ (0.56-0.86) \end{gathered}$ |
| Higher sch. and Above | $\begin{gathered} 0.54 * * * \\ (0.38-0.78) \\ \hline \end{gathered}$ | $\begin{gathered} 0.39 * * * \\ (0.28-0.56 \\ \hline \end{gathered}$ | $\begin{gathered} 0.61 * * * \\ (0.44-0.83) \\ \hline \end{gathered}$ | $\begin{gathered} 0.58 * * \\ (0.37-0.91) \\ \hline \end{gathered}$ | $\begin{gathered} 0.69 * * * \\ (0.52-0.92) \\ \hline \end{gathered}$ | $\begin{gathered} 0.82^{*} \\ (0.67-1.02) \\ \hline \end{gathered}$ |
| Religion |  |  |  |  |  |  |
| Hindu |  |  |  |  |  |  |
| Muslim | 0.97 | 1.22 | $\begin{gathered} 1.69 * * * \\ (1.34-2.14) \\ \hline \end{gathered}$ | 0.99 | $\begin{gathered} 1.33 * * \\ (1.06-1.67) \\ \hline \end{gathered}$ | $\begin{gathered} 0.81^{*} \\ (0.66-1.01) \\ \hline \end{gathered}$ |
| Others** | 1.41 | 0.89 | 0.97 | 0.85 | 1.11 | 1.12 |
| Caste group |  |  |  |  |  |  |
| Scheduled tribes |  |  |  |  |  |  |
| Scheduled castes | 1.15 | 1.07 | $\begin{gathered} \hline 1.64 * * * \\ (1.15-2.34) \\ \hline \end{gathered}$ | 1 | 1.26 | $\begin{gathered} 0.76^{* *} \\ (0.60-0.96) \\ \hline \end{gathered}$ |


| Table 5: Contd., |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Background Characteristics | Arthritis | Angina | Chronic Lung Disease | Asthma | Depression | Hypertension |
| Others*** | 1.31 | 1.12 | $\begin{gathered} 1.4^{*} \\ (1.0-1.95) \\ \hline \end{gathered}$ | 0.88 | $\begin{gathered} 1.41^{*} \\ (1.02-1.96) \\ \hline \end{gathered}$ | $\begin{gathered} 0.72 * * * \\ (0.58-0.89) \\ \hline \end{gathered}$ |
| Working Status |  |  |  |  |  |  |
| Yes working |  |  |  |  |  |  |
| Not working | 1.16 | $\begin{gathered} 1.25 * * \\ (1.05-1.50) \end{gathered}$ | $\begin{gathered} 1.46 * * * \\ (1.23-1.74) \end{gathered}$ | $\begin{gathered} 1.34 * * \\ (1.04-1.72) \end{gathered}$ | $\begin{gathered} 1.28 * * * \\ (1.09-1.50) \end{gathered}$ | 0.98 |
| Wealth quintile |  |  |  |  |  |  |
| Lowest |  |  |  |  |  |  |
| Second | 0.81 | $\begin{gathered} 0.79 * * \\ (0.62-0.99) \end{gathered}$ | 0.95 | 1.03 | $\begin{gathered} \hline 0.83^{*} \\ (0.67-1.02) \\ \hline \end{gathered}$ | 0.88 |
| Middle | $\begin{gathered} 0.78^{*} \\ (0.60-1.03) \\ \hline \end{gathered}$ | 0.86 | 0.94 | 0.78 | $\begin{gathered} 0.78 * * \\ (0.63-0.98) \\ \hline \end{gathered}$ | 0.95 |
| Fourth | 0.79 | $\begin{gathered} 0.74 * * \\ (0.57-0.95) \\ \hline \end{gathered}$ | $\begin{gathered} 0.68^{*} \\ (0.52-0.89) \\ \hline \end{gathered}$ | $\begin{gathered} 0.53 * * * \\ (0.36-0.79) \end{gathered}$ | $\begin{gathered} 0.64 * * * \\ (0.50-0.81) \end{gathered}$ | 0.87 |
| Highest | 0.78 | $\begin{gathered} 0.54 * * * \\ (0.40-0.73) \end{gathered}$ | $\begin{gathered} 0.64 * * * \\ (0.47-0.86) \end{gathered}$ | 0.73 | $\begin{gathered} 0.42 * * * \\ (0.31-0.55) \end{gathered}$ | $\begin{gathered} 0.8^{*} \\ (0.65-1.00) \end{gathered}$ |
| States |  |  |  |  |  |  |
| Assam |  |  |  |  |  |  |
| Karnataka | $\begin{gathered} 0.58 * * \\ (0.36-0.94) \end{gathered}$ | 1 | $\begin{gathered} 0.5 * * * \\ (0.36-0.71) \\ \hline \end{gathered}$ | 1.75 | $10.42^{* * *}$ $(6.16-17.63)$ | 0.96 |
| Maharashtra | 1.12 | $\begin{gathered} 1.67 * * * \\ (1.22-2.30) \end{gathered}$ | 0.91 | $\begin{gathered} 2.58 * * * \\ (1.47-4.52) \end{gathered}$ | $\begin{gathered} 2.19 * * * \\ (1.26-3.81) \end{gathered}$ | $\begin{gathered} 1.26^{*} \\ (0.99-1.59) \end{gathered}$ |
| Rajasthan | $\begin{gathered} 1.86 * * * \\ (1.25-2.76) \\ \hline \end{gathered}$ | 0.77 | $\begin{gathered} 0.62 * * * \\ (0.46-0.84) \\ \hline \end{gathered}$ | 1.59 | $\begin{gathered} 5.16 * * * \\ (3.05-8.74) \\ \hline \end{gathered}$ | 0.85 |
| Uttar Pradesh | $\begin{gathered} 1.56 * * \\ (1.03-2.36) \\ \hline \end{gathered}$ | $\begin{gathered} 0.72^{*} \\ (0.51-1.01) \\ \hline \end{gathered}$ | $\begin{gathered} 0.59 * * * \\ (0.43-0.80) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 2.15 * * * \\ (1.22-3.78) \end{gathered}$ | $\begin{gathered} 10.67 * * * \\ (6.33-17.98) \\ \hline \end{gathered}$ | $\begin{gathered} 0.5 * * * \\ (0.39-0.650 \end{gathered}$ |
| West Bengal | 1.4 | $\begin{gathered} 0.58 * * * \\ (0.41-0.83) \end{gathered}$ | $\begin{gathered} 0.60 * * * \\ (0.44-0.81) \\ \hline \end{gathered}$ | $\begin{gathered} 1.79 * * \\ (1.02-3.16) \end{gathered}$ | $\begin{gathered} 3.13 * * * \\ (1.83-5.37) \\ \hline \end{gathered}$ | 0.83 |
| Note: Significance Level: ***p<0.01, **p<0.05, *p<0, C.I- confidence interval. |  |  |  |  |  |  |

