

Prevalence of Non-Communicable Diseases among Elderly Men in Mumbai

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Abstract : This study uses primary data, collected using cluster sampling of sample size 276 elderly of which 218 were elderly men suffering with Hypertension, Diabetes, Alcohol Abuse, Mental Illness, T.B., Tobacco Use Senile Cataract, Hearing loss, Musculoskeletal Disorder, Respiratory disorder from Shivaji Nagar a non-slum area in Mumbai. This paper examines non-communicable diseases related to elderly men and the utilization of health services available to them in this area. The findings using Chi-Square test reveals that there is a strong association between the age groups of the aged male and the Hypertension, Tobacco Use, Alcohol Abuse, Senile Cataract, Musculoskeletal Disorder, Respiratory order respectively. Even with education level groups of elderly men, it showed strong association between hypertension, Diabetes, Mental Illness, T.B., Tobacco Use, Senile Cataract, Hearing loss, Musculoskeletal Disorder respectively. Besides there was evidence of unimaginable low level of treatment seeking behavior which goes without adequate care taken amongst the poorest stratum of these aged men. The need for care services is suggested at younger age particularly for low-income category in such areas.

Keywords: Non-Communicable diseases, Aging, Treatment, Urban.

1. INTRODUCTION

Populations around the world are rapidly ageing, and low- and middle-income countries are experiencing some of the most dramatic increases. (United Nations, 2010) This demographic transition is closely linked to an epidemiological shift from communicable to non-communicable disease (NCD). (WHO, 2010). Hypertension, a key NCD risk factor, appears to be increasing in prevalence, possibly associated with development, urbanization and lifestyle changes. (WHO, 2010), (Yach, et al., 2004). However, there are large variations in reported prevalence, both across and within countries. (Prince, et al., 2012), (Bosu, et al., 2010). Hypertension prevalence increases with age and is a readily treatable risk factor for the most common causes of morbidity and mortality in older age: stroke, ischemic heart disease, renal insufficiency and dementia. (Steyn et al., 2005), (Ferri, et al., 2011), (Ikeda, et al., 2011). It has been suggested that the burden of stroke and ischaemic heart disease may be several times higher in LMICs than in their high-income counterparts. (WHO, 2010).

Approximately 1.9% of the global disability adjusted life years is attributed to diabetes having doubled since 1990 (Murray, et al., 2012). The International Diabetes Federation (IDF) estimates that 450 million people are living with diabetes, with 5.1 million dying from it annually worldwide (IDF Diabetes Atlas, 2013), (WHO, 2011). The prevalence of diabetes is expected to double by 2030 from 8.3 to 17.6% globally (IDF Diabetes Atlas, 2013), (Guariguata, et. al., 2014), (Whiting, et. al, 2011), excluding the high numbers of undiagnosed cases estimated at 175 million (IDF Diabetes Atlas, 2013), (Beagley, et. al, 2014). Although the burden of diabetes is often described in terms of its impact on working-age adults, diabetes in older adults is linked to higher mortality, reduced functional status, and increased risk of institutionalization (Brown, et. al, 2003). Older adults with diabetes are at substantial risk for both acute and chronic microvascular and cardiovascular complications of the disease.

As the population ages, the prevalence of diseases of older age will rise. Whilst asthma is often considered a disease of younger people, the high prevalence of asthma in the community indicates that many older people suffer from asthma with its associated impact on morbidity and mortality. Moreover, mortality and morbidity statistics suggest that older people suffer disproportionately from the burden of asthma and airways disease with the majority of those dying from asthma aged over 55 years. The reasons for this are multi-faceted and relate to the pulmonary changes of ageing, perceptions of dyspnoea and its meaning to older people, difficulties in asthma diagnosis, and the burden of medication and co-morbidities which render asthma in older age-groups a unique problem deserving of specific examination and therapeutic intervention. (Andrew, et al., 2012). Asthma, a disease of the airways, occurs in people of all ages, and wheeze is the most common symptom. The most recent revised global estimate of asthma suggests that as many as 334 million people have asthma, and that the burden of disability is high. The historical view of asthma being a disease of high-income countries no longer holds: most people affected are in low- and middle-income countries, and its prevalence is estimated to be increasing fastest in those countries. Ongoing monitoring is needed to follow the epidemic of asthma and its management ([The Global Asthma Report 2014](#)). Asthma in the elderly is largely under- or misdiagnosed and, thus, undertreated. This is mainly due to the erroneous belief that asthma is a disease of childhood. It is not rare to fall into the trap of attributing respiratory symptoms suggestive of asthma to conditions other than asthma, *i.e.* chronic obstructive pulmonary disease (COPD), when they occur at older ages. Old observational reports and new epidemiological studies confirm that asthma is as frequent in older as it is in younger populations. LEE and STRETTON (Lee, et al., 1972) in 1972 and later BURR *et al.* (Burr, et al.,

1979) in 1979 showed that features of asthma could be documented in individuals aged 70 years and over, to the same proportion of asthma as in younger ages. (Salvatore B., et al, 2016).

The World Health Organization estimates injuries accounted for more than 5 million deaths in 2004, significantly impacting the global burden of disease. Nearly 3.9 million of these deaths were due to unintentional injury, a cause also responsible for more than 138 million disability-adjusted life years (DALYs) lost in the same year. More than 90% of the DALYs lost occur in low- and middle-income countries (LMICs), highlighting the disproportionate burden that injuries place on developing countries. (Ashton, 2013). Injuries continue to be the leading cause of death for the first four decades of life. These injuries result from a confluence of behavioral, physical, structural, environmental, and social factors. Injury prevention efforts to prevent home injuries benefit from multilevel modifications of behavior, public policy, laws and enforcement, the environment, consumer products and engineering standards, as demonstrated with Frieden's Health Impact Pyramid. (Mack, et al., 2015).

The world's population is ageing rapidly. Between 2015 and 2050, the proportion of the world's older adults is estimated to almost double from about 12% to 22%. In absolute terms, this is an expected increase from 900 million to 2 billion people over the age of 60. Older people face special physical and mental health challenges which need to be recognized. (WHO, 2017). Over 20% of adults aged 60 and over suffer from a mental or neurological disorder (excluding headache disorders) and 6.6% of all disability (disability adjusted life years-DALYs) among people over 60 years is attributed to mental and neurological disorders. These disorders in older people account for 17.4% of Years Lived with Disability (YLDs). The most common mental and neurological disorders in this age group are dementia and depression, which affect approximately 5% and 7% of the world's older population, respectively. Anxiety disorders affect 3.8% of the older population, substance use problems affect almost 1% and around a quarter of deaths from self-harm are among people aged 60 or above. Substance abuse problems among older people are often overlooked or misdiagnosed. (WHO, 2017). Mental health problems are under-identified by health-care professionals and older people themselves, and the stigma surrounding these conditions makes people reluctant to seek help. Mental health has an impact on physical health and vice versa. For example, older adults with physical health conditions such as heart disease have higher rates of depression than those who are healthy. Additionally, untreated depression in an older person with heart disease can negatively affect its outcome. (Ilias, 2017)

Older adults are also vulnerable to elder abuse - including physical, verbal, psychological and financial abuse; abandonment; neglect; and serious losses of dignity and respect. Elder abuse can lead not only to physical injuries, but also to serious, sometimes long-lasting psychological consequences, including depression and anxiety.

Tobacco use is responsible for almost 10,000 deaths each day and approximately 4.9 million deaths per year worldwide (WHO, 2003). Cigarette smoking has been linked to several diseases such as respiratory and ischemic heart diseases, stroke, lung, upper respiratory and digestive tract cancers, and peptic ulcer (WHO, 2003). This habit may contribute to the morbidity and disability associated with many of those illnesses. Smoking is now recognized as a major public health problem also among the elderly. Risk of death among older smokers is higher than among their non-smoking counterparts. Morbidity and mortality from cancer, stroke, cardiovascular, and respiratory diseases are also higher among elderly smokers (Bratzler, et al., 2002), (Husten , et al., 2002). Some data suggest that, as a group, the elderly not only smoke for a longer period of time than younger smokers but are also less aware of the potential harms of tobacco use. As a result, they are more resistant to quit smoking, do not report a greater number of quitting attempts or methods, and tend not only to underestimate the risks but also to overestimate the benefits of smoking (Bratzler, et al., 2002), (Orleans , et al., 1994), (Valeska, et al., 2010).

Around 2 billion people worldwide consume alcoholic beverages. It has been shown that alcohol causes approximately 3.8% of all deaths world-wide (6.3% of men and 1.1% of women) and accounts for 4.6% of the global burden of disease (7.6% of men and 1.4% of women) (Rehm et al., 2009). In most European countries, alcohol consumption was responsible for 14.6% of all premature adult mortality (17.3% for men and 8.0% for women); moreover, in Eastern Europe, particularly in some industrialized cities of Russia, alcohol has been shown to be responsible for more than half of all deaths in younger men (15–54 years), and was a major cause of death in older men (55–74 years) and in women (Fabio, et al., 2012). Over 76 million people have alcohol-use disorders (AUDs) consisting in alcohol dependence, alcohol abuse and dependence or harmful drinking. This latter definition consists of alcohol intake >14 drinks per week or >4 drinks per occasion for men and >7 drinks per week or >3 drinks per occasion for women, where a drink corresponds to 10–12 g of pure alcohol (Schuckit, 2009). AUDs are commonly found in all developed countries, and prevail in men; namely, AUDs were frequently found in Chinese, German, Thai, and US men, and in Brazilian and US women (Rehm et al., 2009). The lifetime risk of AUDs in men is more than 20%, with a risk of about 15% for alcohol abuse and 10% for alcohol dependence (Schuckit, 2009), (Fabio, et al., 2012). Almost 50% of the elderly (aged over 65) and almost 25% of subjects over 85 years old drink alcohol. AUDs afflict 1–3% of elderly subjects and represent a cause of physical and psychiatric morbidity and social distress (Blazer and Wu, 2009).

Musculoskeletal disorders are common problems affecting the elderly. (Wol , et al., 2002). With age, musculoskeletal tissues show increased bone fragility, loss of cartilage resilience, reduced ligament elasticity, loss of muscular strength, and fat redistribution decreasing the ability of the tissues to carry out their normal functions (Freemont, et al., 2007). The loss of mobility and physical independence resulting from arthropathies and fractures can be particularly devastating in this population, not just physically and psychologically, but also in terms of increased mortality rates. (Cheong , et al., 2018).

Blindness is the end stage of many eye disorders. Some previous studies have shown that the most common causes of vision impairments among the elderly are cataract, macular degeneration, glaucoma and diabetic retinopathy (Voleti, et al., 2013), (Owsley, et al., 2011). The occurrence of these disorders differs markedly through the world. Various previous studies have provided estimates on the prevalence and incidence of blindness and visual impairments in Asia and western countries. The eye disease prevalence research group survey result showed cataract, macular degeneration, glaucoma are the most common causes of blindness and low vision in United States (Congdon, et al., 2004). It has been shown that the prevalence of cataract in developing countries and Asia is higher than that of the developed and western populations (Vashist, et al., 2011), (Wong, et al., 2006), (Congdon, et al., 2004). Vashist et al study showed that the prevalence of cataract in people aged ≥ 60 was 56% in north India and 53% in south India. A prevalence survey by Husain et al (15) in Indonesia showed that the prevalence of cataract for adults aged 21 to 29 was 1.1%, increasing to 82.8% for those aged older than 60 years. All previous studies have shown a clinically significant increase in the prevalence of visual impairment with increasing age (Congdon, et al., 2004), (Husain et al., 2005), (Iran, et al., 2015).

Recently, a few studies have been conducted mainly to explore the prevalence of non-communicable diseases among aged men in non-slums area, but negligible attempts were made to examine the determinants of such diseases among aged male in slums. Hence it is necessary to impart knowledge about the prevalence of non-communicable diseases and to understand the root cause of generating such diseases among such poor aged male in non-slum areas. Besides, aged male to which extent are aware of the existing health facilities available and if so, how far it has been adequately utilized, is not known. Thus, keeping in view of the above research work, an attempt is made, to evolve a suitable strategy for knowing

- i) the prevalence of non-communicable diseases among aged men in non-slum area in Mumbai.
- ii) to understand the health seeking behavior among elderly men in non-slums area in Mumbai.

2. BACKGROUND OF THE STUDY AREA

The present study was conducted during December 2016-January 2017 in Mumbai of Maharashtra state of India. The state of Maharashtra situated in the western part of India, came in to existence on 1st May, 1960 with the merging of territories of Bombay state, Madhya Pradesh and Andhra Pradesh. It has a land area of 307713 sq. km. which is about one-tenth of the total land area of the country. As per the 2001 Census of India, the total population of the state is 96.8 million, which is 9.4 percent of the total population of India.

In terms of population size, it is the second largest state of India, Next to Uttar Pradesh. The population density of Maharashtra has increases from 257 persons per sq. km. in 1991 to 314 persons per sq. km. in 2001. The state has six divisions and forty six percent of the state population is concentrated in two divisions Konkan and Pune which forms the most, industrialized part of the state including Mumbai. According to the 2001 Census, the population density within the state ranges from 208 persons per sq. km. in Nagpur division to 807 persons per sq. km. in Konkan division (Director of Census operations, Maharashtra, 2001a). According to the estimates of the Planning Commission, more than one-third of the state population (37 percent) is below the poverty line. Maharashtra has been a destination for a large influx of migrants from other parts of India. Net migration has contributed 19 percent to its population growth during the last decade. The sex ratio for Maharashtra is 922 females per 1000 males.

2.1 Profile of Mumbai City

The city of Mumbai is originally a cluster of seven islands having an area of 603 sq. km. It has grown at a tremendous pace over the years. Between 1941 and 1961 the population grew 2.5 times and between 1961 and 1981 was of two times. Between 1981 and 2001 the population increased from 82 lacs to 120 lacs. Thus, the overall population density of Greater Mumbai works out to be 19000 persons per sq. km. whereas stated earlier Maharashtra's only 314. This high density of population coupled with dearth of housing lead to the development of degrading slums.

Mumbai being the capital of Maharashtra and also the metropolitan city has many features to attract people, generate job opportunity and then people finds the solution to stay where ever possible as per their earning capacity. It has organized industrial sectors, high literacy rate among workers, well planned transportation facility, good drinking water facility, and underground sewage system, basic education provided by Municipal corporation schools and even private schools and free education to girls is also provided by Govt. of Maharashtra. Many Anganwadies located in slums are imparting education to slum children and also to adults so called 'adult education'. Therefore, on the large scale, the migration takes place from the most parts of India to Mumbai.

2.2 Profile of the Study Area

Shivaji Nagar a, non-slum area is located in Deonar, Mumbai is the study area. The population of Shivaji Nagar is 12,500. This area comes under M/East ward. The slum sex ratio of M/East is 785 and the female literacy rates of these areas are 67.49 compared to male literacy rates of 82.9. This ward spreads over 34.38 sq. km. and has density of 13,730 (1991 Census) population per sq. km. Deonar is at the third rank position as far as slum area population is concern. In Deonar out of 6.72 lacs of population, 5.22 lacs of people stay in slum area (population density – 19,546 per sq. km.), according to Census of India, 2001, Maharashtra population data with data on slum population in urban units.

The present study covers elderly men whose age is 60 and above staying in the non-slum area of Shivaji Nagar, Deonar, Mumbai. This study is based on the non-communicable diseases of old male and the health seeking behavior of such elderly people in Shivaji Nagar non-slum area in Mumbai.

The present study was carried out in a urban communities i.e. Shivaji Nagar non-slum area of Deonar in 'M-east' ward of Brihan Mumbai Municipal Corporation. These areas are situated near Govandi (west) railway station, a suburb in the eastern part of Mumbai. The data was collected during December 2016-January 2017.

3. MATERIALS AND METHODS

Initially, one plain area was selected at random. In this area, elderly people whose age is 60 and above were interviewed. Before taking the interview, the consent of such people was taken. Following steps were used to design the survey. The lists of non-slums were obtained using the 'Directory of non-Slums' published by Office of the additional collector (ENC), Mumbai & Mumbai Sub. Dist.(see ref.). From this list, two different lists were made as plain area and hilly area. One non-slum area was selected at random from the plain area. Plain non-slum area was Shivaji Nagar, Deonar, Govandi (West) in Mumbai, Maharashtra, India. The population of this area was 12,500.

The map of non-slum locality, (Shivaji Nagar) was obtained from Urban Health Center / Sub-Center of the study area. Using cluster sampling method aged people having the age 60 and above were interviewed. The house where elderly men was not found, or refused to give interview, such houses were dropped. But, these numbers were negligible. The interviews of the elderly male were conducted by the trained investigators with the help of structured interview schedule in the study area. Even pilot survey was conducted in the study area. After getting responses from the respondents, some amendments were made in the schedule and then such schedule was used for collecting data. The feedback was also given to the entire field staff (Investigators) before taking main survey.

The process of data collection was continued till the required sample size was attained. In all, sample size of 276 elderly were selected from Shivaji Nagar non-Slum area of which 218 were elderly male and 241 were elderly women, which represents population. Due to lack of financial support, larger sample size could not be collected.

Majority of the studies was focused on non-communicable diseases associated with the elderly people. The present study on non-communicable diseases associated with the elderly people in non-slum area is immense useful at this juncture. This information will assist policy makers, health sector and programme administrators in planning and implementing strategies for improving population, health and nutrition programmes. While conducting survey two elderly people have not responded to the investigators. However, due to time constraint and shortage of manpower the study was restricted to certain limit.

Questionnaire used for data collection has six sections: the first section deals with the household information of the aged people whose age is 60 and above. Second section deals with the Characteristics of respondents in Individual in-depth interviews. The third section deals with Diseases that are chronic or associated with chronic conditions whose complications or end-stage outcomes require long-term medical intervention by the formal health sector services associated with elderly. Fourth section deals with the Signs of depression in the elderly. Fifth section deals with morbid conditions among elderly people and finally sixth section deals with health facilities and their utilization. Six sections of questionnaire canvassed in slums were bilingual, with questions in both Marathi and English. (Questionnaire is annexed in the reference). Besides, the investigators were given rigorous training.

Questionnaire's Section III was used to collect information on Disease or condition of elderly whether they were suffering from chronic diseases like Chronic non-infectious diseases: Hypertension Diabetes, Asthma, Ignored injuries (intentional or unintentional), Mental illnesses, Chronic infectious diseases: Tuberculosis, latent TB infection, HIV infection, Acute infectious disease with chronic outcomes: Skin lesion and super infection, Throat Infection, Joint pain (knee), Untreated bacterial pharyngitis; acute rheumatic fever, Behavior and habits: Tobacco use, Alcohol abuse, Illicit drug use.

4. METHOD OF ANALYSIS

Chi-Square test was used to know the association between elderly men age groups and non-communicable diseases and between education of elderly men and non-communicable diseases. For Chi-Square test, the elderly men who were residing in the non-slum area, i.e. Shivaji Nagar for the past 20 years prior to survey were interviewed.

5. CHRONIC DISEASES AMONG ELDERLY

Chronic non-communicable and communicable diseases like hypertension, diabetes, intentional and unintentional injuries, tuberculosis, rheumatic heart disease, and HIV infection are recognized to exist in slums because of the late complications of these diseases that the formal health sector sees and deals with. However, in a non-slum area, little is known about the magnitude, distribution, and risk factors for these illnesses before they manifest as stroke, myocardial infarction, kidney failure, suicide, multidrug-resistant TB, heart valve disease, and AIDS (Table no.1).

Table no. 1: Diseases that are chronic or associated with chronic conditions whose complications or end-stage outcomes require long-term medical intervention by the formal health sector services.

Disease or condition	Complications or end-stage outcomes requiring formal health sector intervention
Chronic non-infectious diseases	
Hypertension	Stroke; cardiovascular events, including myocardial infarction, congestive heart failure; kidney failure
Diabetes	Kidney failure requiring transplantation or dialysis; chronic infection (foot ulcer, osteomyelitis); acute recurrent infections (urinary tract infection, bacteremia, sepsis, pneumonia); blindness; sexual dysfunction
Asthma	Respiratory infection, respiratory failure
Ignored injuries (intentional or unintentional)	Chronic infection (osteomyelitis, non-healing wounds); limb deformity affecting ambulation, manual dexterity; long-term or permanent brain injury
Mental illnesses	Consequences of attempted suicide or homicide; violence; intractable behavior; restricted self-care
Reproductive health problems	Sterility; unwanted pregnancy; peripartum complications; congenital complications of infection (toxoplasmosis, CMV)
Chronic infectious diseases	
Tuberculosis, latent TB infection	Late-stage TB; Multidrug resistant TB
Hepatitis B, C	Liver cirrhosis; hepatocellular carcinoma
HIV infection	AIDS; opportunistic diseases
Acute infectious disease with chronic outcomes	
Sexually-transmitted infection	Reproductive diseases; AIDS
Skin lesion and superinfection	Bacterial superinfection; kidney failure due to post-streptococcal glomerulonephritis
Untreated bacterial pharyngitis; acute rheumatic fever	Post-streptococcal rheumatic heart disease requiring valve replacement
Behavior and habits	
Tobacco use	Cardiovascular diseases, cancer
Alcohol abuse	Liver failure, cirrhosis, unintentional injuries
Illicit drug use	HIV/AIDS; hepatitis B, C; endocarditis, unintentional injuries

6. ASSOCIATION BETWEEN THE AGE OF THE ELDERLY MEN AND THE CHRONIC DISEASES RELATED TO THE CHRONIC NON-INFECTIOUS DISEASES, CHRONIC INFECTIOUS DISEASES, ACUTE INFECTIOUS DISEASE WITH CHRONIC OUTCOMES, ACUTE INFECTIOUS DISEASE WITH CHRONIC OUTCOMES, MORBID CONDITIONS AMONG ELDERLY PEOPLE, SIGNS OF DEPRESSION IN THE ELDERLY.

The Chi-Square test was applied to understand the association between i) **the age** of the elderly men and the chronic diseases ii) the **educational level** of the elderly men and the chronic diseases related to the **Chronic non-infectious diseases** such as Hypertension, Diabetes, Asthma, Ignored injuries and Mental illnesses (intentional or unintentional), **Chronic infectious diseases** such as Tuberculosis, latent TB infection, HIV infection, **Acute infectious disease with chronic outcomes** such as Skin lesion and super infection, Throat Infection, Joint pain (knee), Untreated bacterial pharyngitis; acute rheumatic fever, **Behavior and habits** such as the habits of consumptions of Tobacco Use, Alcohol abuse, Illicit drug use, **Morbid conditions among elderly people** such as Senile cataract, Hearing loss, Musculoskeletal disorders, Respiratory disorders, Gastrointestinal system, Sick (past two weeks), Urinary symptoms including **Signs of depression in the elderly** such as feeling “emptiness and/or ongoing sadness” and “Tiredness, lack of energy”, “Sleeping problems”, “Eating less than usual”, “Crying too often or too much”, felt “Being irritable”, “Loss of interest or pleasure in everyday activities”, finding “A hard time focusing, remembering, or making decisions”, “Feeling guilty, worthless, or hopeless” and have “Thoughts of death or suicide” were done to know whether is there any association between them in the study areas.

6.1 Chronic Non-Infectious Diseases

The cross tabulation was also done according to the age groups of the elderly men related to the chronic diseases such as Hypertension, Diabetes, Asthma, Ignored injuries and Mental illnesses (intentional or unintentional) in the Shivaji Nagar a non-slum area.

Cross tabulation was done according to the **age groups such as 60-64, 65-69, and 70+** of the **elderly men** related to **Hypertension** in the Shivaji Nagar non-slum area. Chi square test shows that there is significant difference (**.047** at 5% level of significance**) between the age groups of the aged male and the **hypertension** they have, treating null hypothesis that there is no association between age of elderly men (≥ 60) and Hypertension. (Table no. 2).

Table no. 2: Cross tabulation of age groups of elderly men related to Hypertension in Shivaji Nagar a, non-slum area, Deonar, Mumbai.

HYPERTENSION	AGE GROUPS			Total
	60-64	65-69	70+	
Yes	47 (58.0 %)	52 (46.0 %)	17 (70.8 %)	116 (53.2%)
No	34 (42.0 %)	61 (54.0%)	7 (29.2 %)	102 (46.8%)
Total	81 (100.0%)	113 (100.0%)	24 (100.0%)	218 (100.0%)
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	6.096	2	.047**	Significant

6.2 Chronic Infectious Diseases

The cross tabulation was done according to the age groups of the elderly men related to the **Chronic infectious diseases** such as Tuberculosis, latent TB infection, HIV infection, in Shivaji Nagar a non-slum area.

6.3 Acute Infectious Disease with Chronic Outcomes

The cross tabulation was done according to the **age groups** of the elderly men related to the **Acute infectious disease with chronic outcomes** such as Skin lesion and super infection, Throat Infection, Joint pain (knee), Untreated bacterial pharyngitis; acute rheumatic fever in Shivaji Nagar non-slum area.

6.4 Behavior and Habits

The cross tabulation was done according to the **age groups** of the elderly men related to the **Behavior and habits** such as the habits of consumptions of Tobacco Use, Alcohol abuse, Illicit drug use in Shivaji Nagar non-slum area.

Cross tabulation was done according to the **age groups such as 60-64, 65-69, and 70+** of the **elderly men** related to **Tobacco Use and Alcohol abuse** in the Shivaji Nagar non-slum area.

Chi square test shows that there is significant difference (**.024** at 5% level of significance**) between the age groups of the aged male and the **Tobacco Use** they have, treating null hypothesis that there is no association between age of elderly men (≥ 60) and Hypertension. (Table 3).

Chi square test shows that there is significant difference (**.071* at 10% level of significance**) between the age groups of the aged male and the **Alcohol abuse** they have, treating null hypothesis that there is no association between age of elderly men (≥ 60) and Hypertension. (Table no. 3).

Table 3: Cross tabulation of age groups of elderly men related to Tobacco Use and Alcohol abuse in Shivaji Nagar non-slum area, Deonar, Mumbai.

TOBACCO Use	AGE GROUPS			
	60-64	65-69	70+	TOTAL
Yes	63	67	17	147
	77.8%	59.3%	70.8%	67.4%
No	18	46	7	71
	22.2%	40.7%	29.2%	23.6%
Total	81	113	24	218
	100.0%	100.0%	100.0%	100.0%
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	7.483	2	.024**	Significant
ALCOHOL ABUSE				
Yes	38	49	5	92
	46.9%	43.4%	20.8%	42.2%
No	43	64	19	126
	53.1%	56.6%	79.2%	57.8%
Total	81	113	24	218
	100.0%	100.0%	100.0%	100.0%
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	5.292	2	.071*	Significant

6.5 Morbid Conditions among Elderly People

The cross tabulation was done according to the **age groups** of the elderly men related to the **Morbid conditions among elderly people** such as Senile cataract, Hearing loss, Musculoskeletal disorders, Respiratory disorders, Gastrointestinal system, Sick (past two weeks), Urinary symptoms in Shivaji Nagar non-slum area.

Cross tabulation was done according to the **age groups such as 60-64, 65-69, and 70+** of the **elderly men** related to **Senile Cataract, Musuloskeletal Disorder, Respiratory Order** in Shivaji Nagar non-slum area.

Chi square test shows that there is significant difference (**.010** at 5% level of significance, .004*** at 1% level of significance and .000* at 1% level of significance**) between the age groups of the aged male and **Senile Cataract, Musuloskeletal Disorder and Respiratory Order** respectively they have, treating null hypothesis that there is no association between age of elderly men (≥ 60) and Hypertension. (Table 4).

Table 4: Cross tabulation of age groups of elderly men related to Senile Cataract, Musuloskeletal Disorder, Respiratory Order in Shivaji Nagar non-slum area, Deonar, Mumbai.

SENILE CATARACT	AGE GROUPS			TOTAL
	60-64	65-69	70+	
Yes	34	25	9	68
	42.0%	22.1%	37.5%	31.2%

No	47	88	15	150
	58.0%	77.9%	62.5%	68.8%
Total	81	113	24	218
	100.0%	100.0%	100.0%	100.0%
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	9.163	2	.010**	Significant
MUSULOSKELETAL DISORDER				
	60-64	65-69	70+	TOTAL
Yes	45	38	14	97
	55.6%	33.6%	58.3%	44.5%
No	36	75	10	121
	44.4%	67.4%	41.7%	55.5%
Total	81	113	24	218
	100.0%	100.0%	100.0%	100.0%
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	11.276	2	.004***	Significant
RESPIRATORY ORDER				
	60-64	65-69	70+	TOTAL
Yes	7	10	9	26
	8.6%	8.8%	37.5%	11.9%
No	74	103	15	192
	91.4%	91.2%	62.5%	88.1%
Total	81	113	24	218
	100.0%	100.0%	100.0%	100.0%
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	16.793	2	.000***	Significant

7. ASSOCIATION BETWEEN THE EDUCATIONAL LEVEL OF THE ELDERLY MEN AND THE CHRONIC DISEASES RELATED TO THE CHRONIC NON-INFECTIOUS DISEASES, CHRONIC INFECTIOUS DISEASES, ACUTE INFECTIOUS DISEASE WITH CHRONIC OUTCOMES, ACUTE INFECTIOUS DISEASE WITH CHRONIC OUTCOMES, MORBID CONDITIONS AMONG ELDERLY PEOPLE, SIGNS OF DEPRESSION IN THE ELDERLY.

The cross tabulation was done according to the **educational level** of the elderly men related to the **Chronic non-infectious diseases** such as Hypertension, Diabetes, Asthma, Ignored injuries and Mental illnesses (intentional or unintentional), **Chronic infectious diseases** such as Tuberculosis, latent TB infection, HIV infection, **Acute infectious disease with chronic outcomes** such as Skin lesion and super infection, Throat Infection, Joint pain (knee), Untreated bacterial pharyngitis; acute rheumatic fever, **Behavior and habits** such as the habits of consumptions of Tobacco Use, Alcohol abuse, Illicit drug use, **Morbidity conditions among elderly people** such as Senile cataract, Hearing loss, Musculoskeletal disorders, Respiratory disorders, Gastrointestinal system, Sick (past two weeks), Urinary symptoms including **Signs of depression in the elderly** such as feeling “emptiness and/or ongoing sadness” and “Tiredness, lack of energy”, “Sleeping problems”, “Eating less than usual”, “Crying too often or too much”, felt “Being irritable”, “Loss of interest or pleasure in everyday activities”, finding “A hard time focusing, remembering, or making decisions”, “Feeling guilty, worthless, or hopeless” and have “Thoughts of death or suicide” were done to know whether there is any association between them in the study areas.

7.1 Chronic Non-Infectious Diseases

Cross tabulation was done according to the educational level **such as “Illiterate”, 1-7 and 8+** of the **elderly men** related to **Hypertension and Diabetes and Mental Illness** in the Shivaji Nagar non-slum area.

Chi square test shows that there is significant difference (**.011** at 5% level of significance, .000*** at 1% level of significance, .064* at 10% level of significance**) respectively between the educational level of the aged male and **Hypertension**

and Diabetes and Mental Illness they have, treating null hypothesis that there is no association between educational level of elderly men (≥ 60) and Hypertension and Diabetes and Mental Illness respectively. (Table 5).

Table 5: Cross tabulation of educational groups of elderly men related to Hypertension and Diabetes and Mental Illness in Shivaji Nagar non-slum area, Deonar, Mumbai.

HYPERTENSION	EDUCATIONAL LEVEL			TOTAL
	Illiterate	1-7	8+	
Yes	40	39	37	116
	62.5%	60.9%	41.1%	53.2%
No	24	25	53	102
	37.5%	39.1%	58.9%	46.8%
Total	64	64	90	218
	100.0%	100.0%	100.0%	100.0%
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	9.045	2	.011**	Significant
DIABETES	EDUCATIONAL LEVEL			TOTAL
	Illiterate	1-7	8+	
Yes	36	28	24	94
	56.2%	43.8%	26.7%	43.1%
No	34	30	66	124
	53.1%	46.9%	73.3%	56.9%
Total	64	64	90	218
	100.0%	100.0%	100.0%	100.0%
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	17.044	2	.000***	Significant
MENTAL ILLNESS	EDUCATIONAL LEVEL			TOTAL
	Illiterate	1-7	8+	
Yes	4	2	0	6
	6.2%	3.1%	0%	2.8%
No	60	62	90	212
	93.8%	96.9%	100%	97.2%
Total	64	64	90	218
	100.0%	100.0%	100.0%	100.0%
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	5.506	2	.064*	Significant

7.2 Chronic Infectious Diseases

Cross tabulation was done according to the educational level such as "Illiterate", 1-7 and 8+ of the elderly men related to Tuberculosis in the Shivaji Nagar non-slum area.

Chi square test shows that there is significant difference (.001*** at 1% level of significance) between the educational level of the aged male and Tuberculosis they have, treating null hypothesis that there is no association between educational level of elderly men (≥ 60) and Tuberculosis. (Table 6).

Table 6.: Cross tabulation of educational groups of elderly men related to Tuberculosis Shivaji Nagar non-slum area, Deonar, Mumbai.

TUBERCULOSIS	EDUCATIONAL LEVEL			TOTAL
	Illiterate	1-7	8+	

Yes	8	16	4	28
	12.5%	25.0%	4.4%	12.8%
No	56	48	86	190
	87.5%	75.0%	95.6%	87.2%
Total	64	64	90	218
	100.0%	100.0%	100.0%	100.0%
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	14.127	2	.001***	Significant

7.3 Behavior and Habits

Cross tabulation was done according to the **educational level** such as “**Illiterate**”, **1-7** and **8+** of the **elderly men** related to **Tobacco Use** in the Shivaji Nagar non-slum area.

Chi square test shows that there is significant difference (**.000*** at 1% level of significance**) between the educational level of the aged male and the **Tobacco Use** they have, treating null hypothesis that there is no association between age of elderly men (≥ 60) and **Tobacco Use**. (Table 7).

Table 7.: Cross tabulation of educational groups of elderly men related to Tobacco Use Shivaji Nagar non-slum area, Deonar, Mumbai.

TOBACCO USE	EDUCATIONAL LEVEL			TOTAL
	Illiterate	1-7	8+	
Yes	55	50	42	147
	85.9%	78.1%	46.7%	67.4%
No	9	14	48	71
	14.1%	21.9%	53.3%	32.6%
Total	64	64	90	218
	100.0%	100.0%	100.0%	100.0%
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	30.983	2	.000***	Significant

7.4 Morbid Conditions Among Elderly People

Cross tabulation was done according to the **educational level** such as “**Illiterate**”, **1-7** and **8+** of the **elderly men** related to **Senile Cataract, Hearing Loss, Musculoskeletal Disorder** respectively they have, treating null hypothesis that there is no association between age of elderly men (≥ 60) and **Senile Cataract, Hearing Loss, Musculoskeletal Disorder** respectively in the Shivaji Nagar non-slum area.

Chi square test shows that there is significant difference (**.000*** at 1% level of significance, .018** at 5% level of significance, .001*** at 1% level of significance**) respectively between the educational level of the aged male and the **Senile Cataract, Hearing Loss, Musculoskeletal Disorder** respectively they have, treating null hypothesis that there is no association between age of elderly men (≥ 60) and **Senile Cataract, Hearing Loss, Musculoskeletal Disorder** respectively. (Table 8).

Table 8.: Cross tabulation of educational groups of elderly men related to Senile Cataract, Hearing Loss, Musculoskeletal Disorder in Shivaji Nagar non-slum area, Deonar, Mumbai.

SENILE CATARACT	EDUCATIONAL LEVEL			TOTAL
	Illiterate	1-7	8+	
Yes	31	27	10	68
	48.4%	42.2%	11.1%	31.2%
No	33	37	80	150
	51.6%	57.8%	88.9%	68.8%
Total	64	64	90	218

	100.0%	100.0%	100.0%	100.0%
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	29.383	2	.000***	Significant
HEARING LOSS MALE	Illiterate	1-7	8+	TOTAL
Yes	27	21	19	67
	42.2%	32.8%	21.1%	30.7%
No	37	43	71	151
	57.8%	67.2%	78.9%	69.3%
Total	64	64	90	218
	100.0%	100.0%	100.0%	100.0%
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	7.989	2	.018**	Significant
MUSCULOSKELETAL DISORDER				
Yes	35	35	27	97
	54.7%	54.7	30.0%	44.5%
No	29	29	63	121
	45.3%	45.3%	70.0%	55.5%
Total	64	64	90	218
	100.0%	100.0%	100.0%	100.0%
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	13.041	2	.001***	Significant

8. CONCLUSION:

Thus, it was found that the elderly men who were residing in a non-slum area, were found suffering from

A) Chronic non-infectious diseases such as Hypertension, Diabetes, Mental illnesses.

In the long term, those elderly men were suffering from

- i) Hypertension may lead to Stroke; cardiovascular events, including myocardial infarction, congestive heart failure; kidney failure.
- ii) Diabetes may lead to Kidney failure requiring transplantation or dialysis; chronic infection (foot ulcer, osteomyelitis); acute recurrent infections (urinary tract infection, bacteremia, sepsis, pneumonia); blindness; sexual dysfunction
- iii) Mental illnesses may lead to Consequences of attempted suicide or homicide; violence; intractable behavior; restricted self-care and

B) Chronic infectious diseases such as Tuberculosis, latent TB infection,

In the long term, those elderly suffering from

Tuberculosis, latent TB infection may lead to Late-stage TB; Multidrug resistant TB

C) Behavior and habits such as Tobacco use, Alcohol abuse

In the long term, those elderly suffering from

- i) Tobacco use may lead to Cardiovascular diseases, cancer
- ii) Alcohol abuse may lead to Liver failure, cirrhosis, unintentional injuries

Thus, probably unawareness may be one of the determinant factors which lower the knowledge of elderly men regarding the diseases they suffering from.

9. HEALTH FACILITIES AVAILABLE AND THEIR UTILIZATION AMONG ELDERLY IN THE NON-SLUM AREA

Table no. 8 shows the Health facilities available in the study area and the utilization of such facilities among elderly in the Shivaji Nagar non-slum area.

In the Shivaji Nagar non-slum area, 44.5% of elderly male have not sought treatment from Govt. hospital.

Only 64.5 % of elderly men have taken treatment from Govt. Hospital, where as 86.2% men and 91.6 female were satisfied with the Govt. Hospital treatment.

64.5% and 60.3% of elderly male and elderly female respectively have taken treatment from Govt. hospital from Shivaji Nagar non-slum area, where as 19.2% of elderly male were found satisfied with the treatment from Govt. Hospital.

Those elderly males who have taken treatment from Private Hospital, only 53.6 % were satisfied with the treatment. Even after taking treatment from private hospital, only 1.9 % of elderly male were found unsatisfactory with the treatment.

Table 9: Health facilities available and their utilization of facilities among elderly men in the Shivaji Nagar Non-slum area, Deonar, Mumbai.

	Yes(%)	No (%)	Total (%)
Have you sought treatment	121 (55.5%)	97 (44.5%)	218 (100%)
If yes, From Govt Hospital	78 (64.5%)	43 (35.5)	121 (100.0)
Are you satisfied with Govt treatment	63 (80.8%)	15 (19.2%)	78 (100.0%)
If no, taken treatment from Private hospital	52 (53.6%)	45 (46.4%)	97 (100.0%)
Are you satisfied with treatment taken from private hospital	51 (98.1%)	1 (1.9%)	52 (100.0%)

10. POLICY IMPLICATIONS

Elderly people living in non-slums have a high risk of developing hypertension. Furthermore, the results indicate that awareness and treatment of hypertension in urban area residents is inadequate. Generally, in developing countries, prevalence of hypertension appears to be rising rapidly and the societal response is fragmented with very low levels of awareness, treatment and control. This is worse in the densely populated the urban areas. The results discussed above have important implications both for clinicians and public health professionals. Moreover, there is need for public education concerning management of hypertension starting early in life and regular screening of people at risk in the urban areas. The high prevalence of risk factors for non-communicable diseases across elderly age groups in this urban area community indicates the likelihood of a high future burden of illness. Immediate action for prevention and control is required to prevent the situation from worsening.

11. FURTHER RESEARCH

The project in the non-slum area, among elderly men in Mumbai was undertaken to have a firsthand knowledge about the diseases /infections particularly chronic and non-chronic diseases associated with elderly men in Mumbai and efforts are also made to know its prevalence. The disease pattern among elderly men was found to be very high. The awareness increases with the increase in the level of education. This meager research is not enough to generalize the awareness about the diseases among elderly men in a non-slum area and there is a scope for further research in such area with a larger sample size.

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REFERENCES

1. Andrew Gillman¹ and Jo A Douglass^{2,3}. Asthma in the elderly, *Asia Pac Allergy*. 2012 Apr; 2(2): 101–108. Published online 2012 Apr 30. doi: [10.5415/apallergy.2012.2.2.101](https://doi.org/10.5415/apallergy.2012.2.2.101)

2. ASHTON ACTON (2013), ISSUES IN GLOBAL, PUBLIC, COMMUNITY AND INSTITUTIONAL HEALTH: 2013 EDITION, PP 1028.

3. Beagley J, Guariguata L, Weil C, Motala AA. Global estimates of undiagnosed diabetes in adults. *Diabetes Res Clin Pract.* 2014;103(2):150–160. doi: 10.1016/j.diabres.2013.11.001. [[PubMed](#)] [[Cross Ref](#)]
4. Blazer, D.G., Wu, L.T., 2009. The epidemiology of at-risk and binge drinking among middle-aged and elderly community adults: national survey on drug use and health. *Am. J. Psychiatry* 166, 1162–1169.
5. Bosu W. Epidemic of hypertension in Ghana: a systematic review. *BMC Public Health.* 2010;10:418. [[PMC free article](#)] [[PubMed](#)]
6. Bratzler DW, Oehlert WH, Austelle A. Smoking in the elderly: it's never too late to quit. *J Okla State Med Assoc* 2002; 95:185-91.
7. Brown AF, Mangione CM, Saliba D, Sarkisian CA ; California Healthcare Foundation/American Geriatrics Society Panel on Improving Care for Elders with Diabetes. Guidelines for improving the care of the older person with diabetes mellitus. *J Am Geriatr Soc* 2003;51(Suppl. Guidelines):S265–S280
8. Burr MI, Charles Tj, Roy K, et al. asthma in the elderly: an epidemiological survey. *br med j* 1979; 1: 1041–1044. [[pmc free article](#)] [[pubmed](#)]
9. Centers for Disease Control and Prevention. Annual smoking-attributable mortality, years of potential life lost, and economic costs: United States, 1995-1999. *MMWR Morb Mortal Wkly Rep* 2002; 51:300-3.
10. Cheong HW, Peh WC, Guglielmi G. Imaging of diseases of the axial and peripheral skeleton. *Radiol Clin North Am* 2008;46:703-33, vi (*PDF*) *Musculoskeletal Disorders in the Elderly*. Available from: https://www.researchgate.net/publication/230736064_Musculoskeletal_Disorders_in_the_Elderly [accessed Jun 24 2018].
11. Congdon N, O'Colmain B, Klaver CC, Klein R, Muñoz B, Friedman DS, et al. Eye diseases prevalence research group. Causes and prevalence of visual impairment among adults in the United States. *Archives of Ophthalmology.* 2004; 122(4): 477-85.
12. Congdon N, Vingerling JR, Klein BE, West S, Friedman DS, Kempen J, et al. Eye diseases prevalence research group. Prevalence of cataract and pseudophakia /aphakia among adults in the United States. *Archives of Ophthalmology.* 2004; 122(4): 487-94.
[Fabio Caputo](#)¹, [Teo Vignoli](#)², [Lorenzo Leggio](#)^{3,4}, [Giovanni Addolorato](#)⁴, [Giorgio Zoli](#)¹, and [Mauro Bernardi](#)⁵ · ALCOHOL USE
13. DISORDERS IN THE ELDERLY: A BRIEF OVERVIEW FROM EPIDEMIOLOGY TO TREATMENT OPTIONS, [Exp Gerontol.](#) Author manuscript; available in PMC 2016 Aug 25. Published in final edited form as: *Exp Gerontol.* 2012 Jun; 47(6): 411–416. Published online 2012 Apr 10. doi: [10.1016/j.exger.2012.03.019](https://doi.org/10.1016/j.exger.2012.03.019)
14. Ferri CP, Schoenborn C, Kalra L, et al. Prevalence of stroke and related burden among older people living in Latin America, India and China. *J Neurol Neurosurg Psychiatry.* 2011;26:511–19. [[PMC free article](#)] [[PubMed](#)]
15. Freemont AJ, Hoyland JA. Morphology, mechanisms and pathology of musculoskeletal ageing. *J Pathol* 2007;211:252-9.
16. Guariguata L, Whiting DR, Hambleton I, Beagley J, Linnenkamp U, Shaw JE. Global estimates of diabetes prevalence for 2013 and projections for 2035. *Diabetes Res Clin Pract.* 2014;103(2):137–149. doi: 10.1016/j.diabres.2013.11.002. [[PubMed](#)] [[Cross Ref](#)]
17. Husain R, Tong L, Fong A, Cheng JF, How A, Chua WH, et al. Prevalence of cataract in rural Indonesia. *Ophthalmology.* 2005; 112(7): 1255- 62
18. Husten CG, Shelton DM, Chrismon JH, Lin YCW, Mowery P, Powell FA. Cigarette smoking and smoking cessation among older adults: United States, 1965-94. *Tob Control* 1997; 6:175-80.
19. IDF: IDF Diabetes Atlas, 6 edn. Brussels, Belgium: International Diabetes Federation; 2013.
20. Ikeda N, Saito E, Kondo N, et al. What has made the population of Japan healthy? *Lancet.* 2011;378:1094–105. [[PubMed](#)]
21. Ilias Grammatikopoulos (2017) , Mental health in elderly in the era of economic crisis in Greece. University of Ioannina, Greece, Accepted on October 14, 2017, *Journal of Mental Health and Aging*
22. Iran Afsun Nodehi Moghadam, Maryam Goudarzian, Farhad Azadi, Arezoo Nasiri, Seyedeh Masume Hosseini, Zahra

23. Mosallanezhad, Nouraddin Karimi, Yassin Larne, Maryam Habibi, Poorya Yaghmaei, Sosan Geranmayeh, Prevalence of Eye Disorders in Elderly Population of Tehran, *Elderly Health Journal* 2015; 1(2): 46-51. Shahid Sadoughi University of Medical Sciences, Yazd, Iran Journal Website : <http://ehj.ssu.ac.ir>

24. Kearney P, Whelton M, Reynolds K, Muntner P, Whelton P, He J. Global burden of hypertension: analysis of worldwide data. *Lancet*. 2005;365:217–23. [[PubMed](#)]

25. Lee hy, stretton tb. asthma in the elderly. *br med j* 1972; 4: 93–95. [[pmc free article](#)] [[pubmed](#)]

26. MACK KA¹, LILLER KD², BALDWIN G³, SLEET D³. PREVENTING UNINTENTIONAL INJURIES IN THE HOME USING THE HEALTH IMPACT PYRAMID. *HEALTH EDUC BEHAV*. 2015 APR;42(1 SUPPL):115S-122S. DOI: 10.1177/1090198114568306.

27. Mohan S, Campbell N, Chockalingam A. Management of hypertension in low and middle income countries: challenges and opportunities. *Prev Control*. 2005;1:275–84.

28. Murray CJ, Vos T, Lozano R, Naghavi M, Flaxman AD, Michaud C, Ezzati M, Shibuya K, Salomon JA, Abdalla S, et al. Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990-2010: a systematic analysis for the global burden of disease study 2010. *Lancet*. 2012;380(9859):2197–2223. doi: 10.1016/S0140-6736(12)61689-4. [[PubMed](#)] [[Cross Ref](#)]

29. Orleans CT, Jepson C, Resch N, Rimer BK. Quitting motives and barriers among older smokers: the 1986 adult use of tobacco survey revisited. *Cancer* 1994; 74:2055-61.

30. Owsley C. Aging and vision. *Vision Research*. 2011; 51(13): 1610-22.

31. Prince M, Ebrahim S, Acosta D, et al. Hypertension prevalence, awareness, treatment and control among older people in low and middle income countries; a 10/66 cross-sectional population-based survey in Latin America, India and China. *J Hypertens*. 2012;30:177–87. [[PubMed](#)]

32. Salvatore Battaglia,¹ Alida Benfante,¹ Mario Spatafora,¹ and Nicola Scichilone^{1,2} Asthma in the elderly: a different disease? *Breathe (Sheff)*. 2016 Mar; 12(1) : 18–28. doi: [10.1183/20734735.002816](https://doi.org/10.1183/20734735.002816)

33. Steyn K, Sliwa K, Hawken S, et al. Risk Factors Associated With Myocardial Infarction in Africa. The INTERHEART Africa Study. *Circulation*. 2005;112:3554–61. [[PubMed](#)]

34. Subburam R, Sankarapandian M, Gopinath DR, Selvarajan SK, Kabilan L. Prevalence of hypertension and correlates among adults of 45-60 years in a rural area of Tamil Nadu. *Indian J Public Health*. 2009;53:37–40. [[PubMed](#)]

35. THE GLOBAL ASTHMA REPORT 2014

36. United Nations. *World Population Prospects, The 2010 Revision*. New York: United Nations Population Division; 2010.

37. Valeska Marinho, Jerson Laks, Evandro Silva Freire Coutinho, Sergio Luís Blay, (2010) : Tobacco use among the elderly: a systematic review and meta-analysis, *Cad. Saúde Pública*, Rio de Janeiro, 26(12):2213-2233, dez, 2010.

38. Vashist P, Talwar B, Gogoi M, Maraini G, Camparini M, Ravindran RD, et al. Prevalence of cataract in an older population in India: the India study of age-related eye disease. *Ophthalmology*. 2011; 118(2): 272-8.

39. Voleti VB, Hubschman J. Age-related eye disease. *Maturitas*. 2013; 75(1): 29-33

40. Whiting DR, Guariguata L, Weil C, Shaw J. IDF diabetes atlas: global estimates of the prevalence of diabetes for 2011 and 2030. *Diabetes Res Clin Pract*. 2011;94(3):311–321. doi: 10.1016/j.diabres.2011.10.029. [[PubMed](#)] [[Cross Ref](#)]

41. World Health Organization (WHO) *Mental health of older adults, Fact Sheet*, 12 December 2017

42. World Health Organization (WHO) *Global status report on noncommunicable diseases 2010*. Italy: World Health Organization; 2011

43. Wol JL, Stareld B, Anderson G. Prevalence, expenditures, and complications of multiple chronic conditions in the elderly. *Arch Intern, Med* 2002;162:2269-76.

44. Wong TY, Loon SC, Saw SM. The epidemiology of age related eye diseases in Asia. *The British Journal of Ophthalmology*. 2006; 90(4): 506-11.

45. World Health Organization (WHO) *Global Status Report on Noncommunicable Diseases 2010*. Geneva: WHO; 2010.

46. World Health Organization. Confronting the tobacco epidemic in an era of trade liberation. Geneva: World Health Organization; 2003.

47. Yach D, Hawkes C, Gould C, Hofman K. (2004) The global burden of chronic diseases. Overcoming impediments to prevention and control. JAMA. 2004;291:2616–22. [[PubMed](#)]

