

Chronic Diseases Related to Aging and Disease Prevention in Slums in Mumbai

V. M. Sarode*

Department of Mathematics and Statistics, Mulund College of Commerce, Mumbai, India

Abstract

This study uses primary data, collected using cluster sampling of sample size of 302 of elderly suffering with Hypertension, Diabetes, TB, Throat infection, HIV, Joint pain from Rafi Nagar slum in Mumbai. The paper examines chronic diseases related to aged slum dwellers and the utilization of health services available to these elderly people in the slum. The findings reveal highly significant disorders among aged women related to Skin lesion and super infection, Untreated bacterial pharyngitis; acute rheumatic fever while disorders among aged men found related to hypertension, Illicit drug use, diabetes, Asthma 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 slum dwellers. The need for care services is suggested for such aged slum dwellers particularly low income category women in such slum.

Keywords: Chronic diseases; Aging; treatment; Mumbai slums

Introduction

The biggest underlying risk factor for chronic disease in older people is high blood pressure, which can explain 12 to 19% of the total burden of disease in developing countries. India has around 90 million elderly and the figure is expected to increase to 315 million constituting 20% of the total population by 2050 [1]. The risk factors for chronic diseases vary by country. For example, 63% of men over 50 in India smoke, compared with only 11% in Ghana. In China, 51% of women over 50 have high blood pressure, compared with 27% in India [1]. Additionally, there is an increasing proportion of elderly at 80+ ages and is more pronounced among women. According to UNFPA report, "The overwhelming burden of disease in older persons is from non-communicable diseases (NCDs). Heart disease, stroke and chronic lung disease are the biggest killers. Visual and hearing impairment, dementia and osteoarthritis are the main causes of disability. These diseases affect older persons in developing countries far more than in the developed world."

According to the Study on Global Ageing an Adult Health (SAGE) among males and females aged 50 or older across six countries, including India, 87.9% men and 93.5% women in this age group have insufficient nutrition intake, while 24% men and 26% women have low physical activity. Around one in four men and equal number of women suffer from high blood pressure. Nearly 63% men and 30% women are daily smokers. Almost three in four men aged 50 and above and over four in five women have high risk waist hip ratio or abdominal obesity that greatly increases cardiovascular disease risk [2].

India is experiencing a rapid health transition, with large and rising burdens of chronic diseases, which accounted for 53% of all deaths and 44% of disability-adjusted life-years (DALYs) lost in 2005 [3]. In 2010, 53% of deaths were due to NCDs, of which Cardio Vascular Diseases (CVDs) accounted for 24%, Respiratory diseases 11%, Cancers 6%, Diabetes 2% and Other NCDs 10% [4].

Studies show that chronic disease is a problem in urban and urban underprivileged areas. A study done in Faridabad had reported 15.8% prevalence of hypertension among women in slums [5]. Another study done in Surat slum showed that the prevalence of hypertension among the elderly was found to be 73.3% [6]. The total prevalence of Diabetes among the elderly was found to be 17.5% when the study was done in

Nagpur slum [7]. Another study done in 13 urban slums of Bangalore city showed that 82.9% of the elderly persons reported suffering from at least one illness. The most important Morbid conditions found were Cataract 72.9%, Anaemia 12.6%, Osteoarthritis 6.2%, chronic bronchitis 6.1% and Hypertension 5.1% [8].

Keeping in view the above research work an attempt is made to evolve a suitable strategy for knowing the prevalence of chronic diseases among elderly persons and the utilization of health services available in the slum area of Greater Mumbai, this study has been initiated.

The present study is an attempt to know

1. The prevalence of chronic diseases among elderly persons residing in the slum area of Mumbai city.
2. The utilization of health services available in the study area.

Background of the Study Area

According to a UNESCO document, "a slum is a building, a group of buildings, or area characterized by overcrowding, deterioration, insanitary conditions or absence of facilities, or amenities which, because of all these conditions or any one of them, endanger the health, safety or morals of its inhabitants or the community [9]. "Slums may be characterized as areas of substandard housing condition within a city. A slum is always an area. A single, neglected building even in the worst stage of decoration does not make a slum" [10]. Apart from these definitions, slum is an area of darkness, an area of poverty and thus poverty is the prime characteristic of slum.

According to Census of India 2001, about 49 percent of population

*Corresponding author: V. M. Sarode, Associate Professor of Statistics, Head, Department of Mathematics and Statistics, Mulund College of Commerce, Mulund (West), Mumbai-400 080, India, Tel: 022 2564 0718; E-mail: vijaymsarode@yahoo.com

Received January 21, 2014; Accepted January 23, 2014; Published January 28, 2014

Citation: Sarode VM (2014) Chronic Diseases Related to Aging and Disease Prevention in Slums in Mumbai. Aging Sci 2: 116. doi: 10.4172/2329-8847.1000116

Copyright: © 2014 Sarode VM. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

of Mumbai lives in slums. About 28 percent and 21 percent of total population is male and female respectively who lives in slums. These slums household people have low income. These people even consist of recent migrants who do odd jobs and cannot afford to pay any rent nor can they leave the city for fear of losing whatever source of income they have. Such people have occupied a space where ever they could find a place even in the face of stringent laws of encroachment. These slums have no basic health facilities like safe drinking water, toilets etc., in fact they have open drainage. They have strong impact of religion and culture and practices of doing early marriages. According to 2001, Census of India, the slum sex ratio of Mumbai is 929 and slum literacy rate is 83.13 where as slum female literacy rate is 75.17 and slum male literacy rate is 89.08. This rate is above the national level.

Materials and Methods

For the present investigation, two stage sampling procedure has been adopted. In the first stage, the slums in Greater Mumbai according to their population size were listed using the “Directory of Slums” published by office of the additional collector (ENC), Mumbai & Mumbai Sub. Dist. [11]. Two lists were prepared, one for plain area slums and other for hilly area slums. From plain area slum list, one slum was selected at random. This plain area slum was Rafi Nagar slum located at Deonar, Mumbai which comes under M/E-ward of Brihan Mumbai Municipal Corporation. The population of this slum (study area) was 8000.

In the second stage of sampling, from this selected slum area, using cluster sampling, two clusters were selected at random. From these two clusters of Rafi Nagar slum area, 302 households were selected, which represents the slum population in Greater Mumbai. The survey was conducted by the trained graduate/undergraduate girls who normally work with the supervision of doctors/ANMs for the pulse-polio programme. This survey was conducted from December 2012 to January, 2013.

The study instrument included questions related to Chronic non-infectious diseases such as Hypertension, Diabetes, Asthma, Ignored injuries 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. The questions on Behavior and habits such as Tobacco Use, Alcohol abuse, illicit drug use, also were included. Besides the questions on morbid conditions among elderly people, whether were suffering from the illness such as Senile cataract, Hearing loss, Musculoskeletal disorders, Respiratory disorders, Gastrointestinal system, Sick (past two weeks), and any Other. At the end, the questions on health facilities and their utilization also were included.

Method of analysis

Chi-Square test was used to understand the association between chronic diseases and age of the elderly, and also with their education. For the Chi-Square test, the elderly slum dwellers who were residing in the slum for the past 20 years prior to survey were interviewed.

Results and Discussion

Table 1 shows the elderly people living in the Rafi Nagar slum, Mumbai according to the selected background. Most of them stay in a joint family (73%), are Muslims in majority (90%), with OBC (35%), having Mother tongue as Hindi (91%), of which 37% were residing in

| | Number | Percentage |
|---|---------------|-------------------|
| Type of family | | |
| Joint | 222 | 73.5 |
| Nuclear | 38 | 12.6 |
| Extended | 42 | 13.9 |
| Total | 302 | 100.0 |
| Religion | | |
| Hindu | 26 | 8.6 |
| Muslim | 273 | 90.4 |
| Buddhist | 1 | .3 |
| Christian | 1 | .3 |
| Other | 1 | .3 |
| Total | 302 | 100.0 |
| Caste | | |
| SC | 2 | .7 |
| ST | 71 | 23.5 |
| OBC | 107 | 35.4 |
| General | 65 | 21.5 |
| Other | 57 | 18.9 |
| Total | 302 | 100.0 |
| Mother tongue | | |
| Marathi | 18 | 6.0 |
| Hindi | 275 | 91.1 |
| South language | 5 | 1.7 |
| Other | 4 | 1.3 |
| Total | 302 | 100.0 |
| Type of house | | |
| Kachcha | 111 | 36.8 |
| Semi-pacca | 57 | 18.9 |
| Pacca | 134 | 44.4 |
| Total | 302 | 100.0 |
| Whether the house is? | | |
| Rented | 86 | 28.5 |
| Own | 215 | 71.2 |
| On govt.land | 1 | .3 |
| Total | 302 | 100.0 |
| No. of rooms | | |
| One | 238 | 78.8 |
| Two | 60 | 19.9 |
| More than two | 4 | 1.3 |
| Total | 302 | 100.0 |
| | Number | Percentage |
| Do you have separate kitchen | | |
| Yes | 64 | 21.2 |
| No | 238 | 78.8 |
| Total | 302 | 100.0 |
| Availability of electricity in the house | | |
| Yes | 253 | 83.8 |
| No | 49 | 16.2 |
| Total | 302 | 100.0 |
| Toilet facility | | |
| Inside the house | 14 | 4.6 |
| Public | 258 | 85.4 |
| Open | 30 | 9.9 |
| Total | 302 | 100.0 |

Table 1: Percentage of Selected background Characteristics in Rafi Nagar Slum, Deonar, Mumbai.

Kachha house, had owned house (71%), and had one room (79%), thus had no separate kitchen (79%), and no electricity (16%) and were using public toilet facility (85%).

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 slums, 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 2).

The cross tabulation was done according to the age of the elderly men and women related to the chronic diseases such as Hypertension, Diabetes, Asthma, Ignored injuries Mental illnesses (intentional or unintentional), Tuberculosis, latent TB infection, HIV infection,

Skin lesion and super infection, Throat Infection, Joint pain (knee), Untreated bacterial pharyngitis; acute rheumatic fever and the habits of consumptions of Tobacco Use, Alcohol abuse, Illicit drug use, including morbid conditions among elderly people such as Senile cataract, Hearing loss, Musculoskeletal disorders, Respiratory disorders, Gastrointestinal system, Sick (past two weeks), were done to know whether is there any association between them.

The cross tabulation was also done according to the education of the elderly men and women related to the chronic diseases mentioned above.

Cross tabulation was done according to the age groups such as 60-64, 65-69, and 70+ of the elderly men related to Hypertension. Chi square test shows that there is significant difference (.094* at 10% level of significance) between the age groups of the aged male persons and the hypertension they have, treating null hypothesis that there is no association between age of elderly (>= 60) and Hypertension (Table 3).

| 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 |

Table 2: 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.

| HYPERTENSION | AGE- Male | | | Total |
|---------------------------|--------------|-------------|------------------------------|--------------------|
| | 60-64 | 65-69 | 70+ | |
| Yes (%) | 28 (31.8%) | 46 (25.1%) | 12 (22.2%) | 6 (14.6%) |
| No (%) | 60 (68.2%) | 137 (74.9%) | 42 (77.8%) | 35 (85.4%) |
| Total (%) | 88 (100.0%) | 183(100.0%) | 54(100.0%) | 41(100.0%) |
| | Value | df | Asymp. Sig. (2-sided) | |
| Pearson Chi-Square | 4.735 | 2 | .094* | Significant |
| ILLICIT DRUG USE | | | | |
| Yes(%) | 0 (0%) | 0 (0%) | 2 (4.9%) | 2 (1.1%) |
| No (%) | 88 (100.0%) | 54 (100.0%) | 39 (95.1%) | 181 (98.9%) |
| Total (%) | 88 (100.0%) | 54 (100.0%) | 41 (100.0%) | 183 (100.0%) |
| | Value | df | Asymp. Sig. (2-sided) | |
| Pearson Chi-Square | 7.003 | 2 | .030** | Significant |

* 10% LS, ** 5% LS, *** 1% LS with 2 df

Table 3: Cross tabulation of age groups of elderly men related to Hypertension and Illicit Drug Use.

Cross tabulation was done according to the age groups such as 60-64, 65-69, and 70+ of the elderly men related to Illicit Drug Use. Chi square test shows that there is significant difference (.030** at 5% level of significance) between the age groups of the aged male persons and the hypertension they have, treating null hypothesis that there is no association between age of elderly (>= 60) and Illicit Drug Use (Table 3).

Cross tabulation was done according to the age groups such as 60-64, 65-69, and 70+ of the elderly women related to skin lesion and super infection. Chi square test shows that there is significant difference (.086* at 10% level of significance) between the age groups of the aged male persons and the skin lesion and super infection they have, treating null hypothesis that there is no association between age of elderly (>=60) and skin lesion and super infection (Table 4).

Cross tabulation was done according to the education groups such as Illiterate, 1-7 standard and studied 8+ standard of the elderly men related to Diabetes. Chi square test shows that there is significant difference (.039*** at 5% level of significance) between the age groups of the aged male persons and the hypertension they have, treating null hypothesis that there is no association between education of elderly and Diabetes (Table 5).

Cross tabulation was done according to the education groups such as Illiterate, 1-7 standard and studied 8+ standard of the elderly men related to Asthma. chi square test shows that there is significant difference (.003*** at 1% level of significance) between the age groups of the aged male persons and the hypertension they have, treating null hypothesis that there is no association between education of elderly and Asthma (Table 5).

Cross tabulation was done according to the education groups such as Illiterate, 1-7 standards and studied 8+ standard of the elderly female

related to skin lesion and super infection. chi square test shows that there is significant difference (.005*** at 1% level of significance) between the age groups of the aged female persons and the hypertension they have, treating null hypothesis that there is no association between education of elderly and skin lesion and super infection (Table 6).

Cross tabulation was done according to the education groups such as Illiterate, 1-7 standard and studied 8+ standard of the elderly female related to untreated bacterial pharyngitis; acute rheumatic fever. chi square test shows that there is significant difference (.076*** at 10% level of significance) between the age groups of the aged female persons and the hypertension they have, treating null hypothesis that there is no association between education of elderly and untreated bacterial pharyngitis; acute rheumatic fever (Table 6) [12-16].

Utilization of health facilities:

Health facilities available in the study area and the utilization of such facilities among elderly in the Rafi Nagar slum area concluded that 49% of elderly male have not sought treatment where as 45% of elderly female even not sought treatment.

Only 93% and 92% of elderly male and elderly female respectively have taken treatment from Govt. hospital, where as 94% of both elderly male and elderly female were found satisfied with the treatment from Govt. Hospital.

Those elderly male who have taken treatment from Private Hospital were only 50% where as treatment taken by elderly female were 45%. Even after taking treatment from private hospital, 11% and 10% of elderly male and elderly female respectively were found unsatisfactory.

Conclusion

Cross tabulation was done according to the i) age groups such as

| SKIN LESION AND SUPER INFECTION | AGE- FEMALE | | | Total |
|---------------------------------|-----------------|-------------|------------------------------|--------------------|
| | 60-64 | 65-69 () | 70+ | |
| Yes (%) | 7 (6.4%) | 0 (0%) | 0 (.0%) | 7 (3.8%) |
| No (%) | 103 (93.6%) | 40 (100.0%) | 34 (100.0%) | 177 (96.2%) |
| Total (%) | 110 (100%) | 40 (100%) | 34 (100%) | 184 (100%) |
| | Value | df | Asymp. Sig. (2-sided) | |
| Pearson Chi-Square | 4.895(a) | 2 | .086* | Significant |

* 10% LS, ** 5% LS, *** 1% LS with 2 df

Table 4: Cross tabulation of age groups of elderly women related to skin lesion and super infection.

| DIABETES | EDUCATION- MALE | | | Total |
|---------------------------|-----------------|------------|------------------------------|--------------------|
| | Illiterate | 1-7 | 8+ | |
| Yes (%) | 19 (17.9%) | 10 (16.4%) | 7 (43.8%) | 36 (19.7%) |
| No (%) | 87 (82.1%) | 51(83.6%) | 9 (56.3%) | 147 (80.3%) |
| Total (%) | 106 (100.0%) | 61(100.0%) | 16 (100.0%) | 183 (100.0%) |
| | Value | df | Asymp. Sig. (2-sided) | |
| Pearson Chi-Square | 6.490(a) | 2 | .039** | Significant |

| ASTHMA | EDUCATION- MALE | | | Total |
|---------------------------|------------------|------------|------------------------------|--------------------|
| | Illiterate | 1-7 | 8+ | |
| Yes (%) | 8 (7.5%) | 3 (4.9%) | 5 (31.3%) | 16 (8.7%) |
| No (%) | 98 (92.5%) | 58 (95.1%) | 11 (68.8%) | 167 (91.3%) |
| Total (%) | 106 (100.0%) | 61(100.0%) | 16 (100.0%) | 183 (100.0%) |
| | Value | df | Asymp. Sig. (2-sided) | |
| Pearson Chi-Square | 11.467(a) | 2 | .003*** | Significant |

* 10% LS, ** 5% LS, *** 1% LS with 2 df

Table 5: Cross tabulation of age groups of elderly men related to Diabetes and Asthama.

| SKIN LESION AND SUPERINFECTION | EDUCATION- FEMALE | | | Total |
|---|-------------------|-------------|-----------------------|--------------|
| | Illiterate | 1-7 | 8+ | |
| Yes (%) | 4 (2.4%) | 3 (18.8%) | 0 (0%) | 7 (3.8%) |
| No (%) | 162 (97.6%) | 13 (81.3%) | 2 (100.0%) | 177 (96.2%) |
| Total (%) | 166 (100.0%) | 16 (100.0%) | 2 (100.0%) | 184 (100.0%) |
| | Value | df | Asymp. Sig. (2-sided) | |
| Pearson Chi-Square | 10.727(a) | 2 | .005*** | Significant |
| UNTREATED BACTERIAL PHARYNGITIS; ACUTE RHEUMATIC FEVER | | | | |
| Yes (%) | 8 (4.8%) | 3 (18.8%) | 0 (0%) | 11 (6.0%) |
| No (%) | 158 (95.2%) | 13 (81.3%) | 2 (100.0%) | 173 (94.0%) |
| Total (%) | 166 (100.0%) | 16 (100.0%) | 2 (100.0%) | 184 (100.0%) |
| | Value | df | Asymp. Sig. (2-sided) | |
| Pearson Chi-Square | 5.167(a) | 2 | .076* | Significant |

* 10% LS, ** 5% LS, *** 1% LS with 2 df

Table 6: Cross tabulation of age groups of elderly women related to skin lesion and super infection and untreated bacterial pharyngitis; acute rheumatic fever.

60-64, 65-69, and 70+ of the i) elderly male related to a) Hypertension, b) Illicit drug use respectively, and

ii) elderly female age groups such as 60-64, 65-69, and 70+ related to Skin lesion and super infection.

Chi-square test showed that there is significant difference between the i) age groups of the aged male persons and the a) Hypertension they have (.094* at 10% level of significance), b) Illicit drug use (0.030 ** at 5% LS) and ii) elderly female age groups and Skin lesion and super infection (.086* at 10% LS) respectively.

Cross tabulation was done according to the i) educational groups such as illiterate, 1-7, and 8+ of the elderly male related to a) Diabetes, b) Asthma and i) elderly female educational groups such as illiterate, 1-7, and 8+ related to a) Skin lesion and super infection and b) Untreated bacterial pharyngitis; acute rheumatic fever.

Chi-square test showed that there is significant difference between

i) educational groups of the aged male persons and the a) Diabetes they have (.039** at 5% level of significance), b) Asthma (0.003 *** at 1% LS) and ii) elderly female educational groups and a) Skin lesion and super infection (.005*** at 1% LS) and b) Untreated bacterial pharyngitis; acute rheumatic fever (0.76* at 10% LS) respectively.

49% of elderly male have not sought treatment where as 45% of elderly female even have not sought treatment.

6% of both elderly male and elderly female were not found satisfied with the treatment from Govt. Hospital.

Even after taking treatment from private hospital (elderly men 50% and elderly female 45%), 11% and 10% of elderly male and elderly female respectively were found unsatisfactory.

Recommendations

The high prevalence of risk factors for non-communicable diseases across all age groups (60+) and even illiteracy in this urban slum community indicates the likelihood of a high future burden of illness.

Adequate determinants of chronic and even acute diseases in slums require long-term prospective population-based surveillance which is also challenging and expensive. But further neglect of this neglected population is likely to become even more costly.

Acknowledgement

Author is thankful to Dr. C. P. Prakasam and the organizers of Eleventh Conference of IASSH organized by School of Public Health, SRM University held at Kattankulathur, Chennai, India from 26-28 December, 2013 for giving him Travel Grant to present this paper, otherwise this presentation would not have possible.

Author is also thankful to the Management and the Principal of Mulund College of commerce, Mumbai – 400080, India for giving him consistent encouragement to present papers in such prestigious conferences.

References

- UNFPA report (2013) Ageing in the 21st century.
- Times of India, TNN Oct 1 2012.
- Global Health Statistics (2012) Global Burden of Disease and Injury Series.
- WHO (2012) NCD country profiles, 2011.
- Anand K, Shah B, Yadav K, Singh R, Mathur P, et al. (2007) Are the urban poor vulnerable to non-communicable diseases? A survey of risk factors for non-communicable diseases in urban slums of Faridabad. *Natl Med J India* 20: 115-120.
- Pawar AB, Bansal RK, Paresh B, Pancha, Shaishav, Patel et al. (2010) Prevalence of hypertension among elderly women in slums of surat city. *National Journal of Community Medicine* 1: 39-40.
- Singh JP, Saoji AV, Kasturwar NB, Pitale SP, Deoke AR, et al. (2011) Epidemiological study of diabetes amongst geriatric population in an urban slum, Nagpur. *National Journal of Community Medicine* 2: 204-208
- NiranjanGV, VasundhraMK, (1996) A Study of health status of aged persons in slums of urban field practice area, Bangalore. *Indian Journal of Community Medicine* 21: 37-40.
- Anderson Nels (1960) *The Urban Community*, pp. 191, Urban Land Policies, New York, United Nations, April 1952.
- Bergel E (1955) *Urban Sociology*, pp 410.
- "Directory of Slums" published by office of the additional collector (ENC), Mumbai & Mumbai Sub. Dist.
- Fiscella K Williams DR (2004) Health disparities based on socioeconomic inequities: implications for urban health care. *Acad Med* 2004 79: 1139- 1147.
- National Center for Chronic Disease Prevention and Health Promotion, Atlanta (2011) "Healthy Aging: Helping People to Live Long and Productive Lives and Enjoy a Good Quality of Life. At a Glance.
- Purty AJ , Joy B, Malini K, Kavita V, Anita V, et al. (2006) Morbidity Pattern Among the Elderly Population in the Rural Area of Tamil Nadu, India. *Turk J Med Sci* 36: 45-50.

15. Ross NA, Gilmour H, Dasgupta K (2010) 14-year diabetes incidence: the role of socio-economic status. *Health Rep* 21: 19-28.
16. Vlahov D, Gibble E, Freudenberg N, Galea S (2004) Cities and health: history, approaches, and key questions. *Acad Med* 79: 1133-1138.