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URBANIZATION, MULTI-MORBIDITIES AND PREFERENCE FOR HEALTH CARE FACILITY: AN INSIGHT FROM RAJASTHAN, INDIA

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Abstract: India experiences rapid pace of urbanization with increasing elderly population and changing disease profile creating new set of health care demands. The study made a novel attempt by exploring the prevalence of morbidities, multi-morbidities along with preferred healthcare facility substantiated by its reasons among the older adults aged 50+ living in urban Rajasthan based on a primary survey. The higher prevalence of single morbidity compared to multi-morbidity reflects the possibility of future healthcare needs. Poisson regression estimates identified the elderly belonging to the non-SC/ST/OBC group and the non-poor household in the age group of 60+ at higher risk of multi-morbidities. The Government hospitals overall enjoy higher acceptance though the reasons vary from their efficiency to lacuna in other healthcare providers. The study suggests incorporating the factors shaping the preferences to develop a suitable healthcare centre for the elderly and the expansion of government healthcare schemes. Successful ageing can get a boost by adequately addressing their healthcare needs.

Key Words: *urban, Rajasthan, older population, healthcare, morbidity.*

Introduction

The world is experiencing demographic transition (leading to population ageing) and urbanization along with epidemiological transition particularly dominant in low and middle income countries (United Nations 2006, He et al. 2012). The simultaneous occurrence of such transitions has major implications for individuals, societies and nations as a whole. Currently, Asia is home to 54% of the world's older population, followed by Europe with a share of 24% (Lin et al. 2008). Further, it is projected that by 2050, 82% of the older population would be residing in regions of Asia, Africa, Latin America and the Caribbean while only 16% would reside in developed regions of Europe and North America. It thus becomes more challenging for the developing economies that are getting old before being rich and they will also be sharing a major proportion of the older population. The issue gets aggravated with the pace of these transitions which is unprecedented; there is no historical evidence to assist the policymakers in deciding the course of governmental actions to ensure healthy urbanization as well as successful ageing (Bloom et al. 2010). India has witnessed almost tripling of its older population in the last four decades (Rajan 2006). Currently, we are home to the second largest older population of the world with a proportion of 8.6% in the total population (Census of India 2011); thus India has acquired the status of an *ageing nation*. This process of ageing would continue to be rapid whereby the percentage of the older population is projected to increase to 13% by 2030 and further to 20% by 2050 (United Nations 2006). Also, the Ministry of Social Justice & Empowerment (2016) has revealed in its report that the number of older population aged 60 years and above would touch the mark of 198 million by 2030. In other words, India has a shorter time span to ensure healthy ageing in its rapidly urbanizing cities.

Globally, urbanization has registered a sharp increase from 30% in 1950, while the percentage of urban population increased to 54% in 2014 which is further projected to increase to 66% by 2050, amounting to more number of people living in urban areas than in rural areas (United Nations 2015). At regional level, North America and Europe stands amongst the most

urbanized regions with more than 70% of their population as urban while Asia and Africa remains mostly rural (48% and 40% urban population respectively) but estimating urbanization at an aggregate level reveals that Asia is home to 53% of the world's urban population followed by Europe (14%); thus, the pace of urbanization will be faster in the Asian and African regions (United Nations 2015); a possible explanation can be the huge population base. It is projected that India, China and Nigeria as a whole will account for 37% of the growth between 2014 and 2050 with India adding the highest number of urban dwellers i.e. 404 million (United Nations 2015). This indicates that the nation with the largest rural population is bound to experience a rapid pace of urbanization in the years to come. The Indian census also confirms it as the decadal growth rate of urban population for the recent decades (1991-2011) is positive while that of total and rural population is negative (Fig. 1). Consequently, percentage of urban population has increased from 11.4% in 1901 to 31% in 2011 (Census of India 1901, 2001 and 2011).

The simultaneous occurrence of urbanization and population ageing as a consequence of

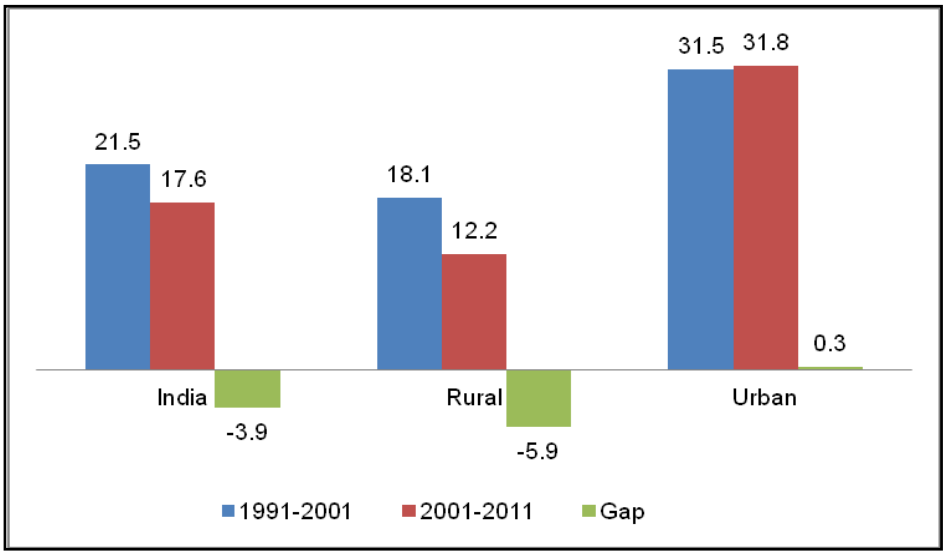

Fig. 1 **– Decadal growth rate of rural, urban and total population in India**
Source: Census of India 2011

economic and medical science development raises various challenges particularly for the health sector since urbanization is a major determinant of public health in the 21st century (World Health Organization 1999). It is generally believed that city dwellers enjoy a better health status (Timaeus and Lush 1995) but an increased exposure to motorized pollution, occupational physical inactivity, access to processed food, tobacco, alcohol etc. has raised critical issues related to the quality of life (Misch 1988, Allender et al. 2010, Kyobutungi et al. 2010, Wagner and Brath 2012). Indeed, mortality levels are controlled in the urban areas but the increasing prevalence of non-communicable diseases (NCDs) raises questions on adding a longer span of diseased years to the human life. The issue gets aggravated with the increasing proportion of the elderly when it is evident that the older adults are at a much higher risk for disease, disability and multiple chronic diseases (Khanam et al. 2011, Salisbury et al. 2011, Salive 2013). The World Health Organization's (2008) estimates show that NCDs accounted for 55% of deaths among the population in the age group of 15 to 60 years whereas for the older population (aged 60+) it was as high as 73%. Further, more than half of the burden of NCDs and 25% of the total disease burden occur in the age group of 45 years and above (Chatterji et

al. 2008); projected to increase to more than 45% by 2030 (Arokiasamy et al. 2015). Along with the increasing prevalence of NCDs, it is the co-existence of multiple chronic morbidities which have become progressively common among the elderly. Studies have shown that multi-morbidities are not only associated with many adverse health outcomes, such as reduced physical functions (Fried et al. 1999, Kadam and Croft 2007), poor quality of life (Fortin et al. 2004), increased use of inpatient and ambulatory care (Salisbury et al. 2011), but their adverse impact is further exacerbated by socioeconomic deprivation and poor medical care facilities (Tu 2004, Lehnert et al. 2011, Marengoni et al. 2011). Another issue that seeks the attention of policymakers concerns with the availability of health care infrastructure as well as the preference of the elderly for health care facility. This was never an issue for India till recently where multiple generations staying together under one roof provided the much needed care, support and security to their elderly members (Kumar 2003, Jain and Prakash 2014); however not only India but many Asian countries are experiencing a rise in nuclear living and the diminishing preference for intergenerational co-residence (Goode 1963, Bongaarts and Zimmer 2002, Adams et al. 2011); thereby uprooting the traditional care givers. In fact, an all-together separate branch of gerontological research focused on the effects of care giving, care receipt and available care options is evolving recognizing the importance of this under researched area (Van Haitsma et al. 2013). Kane and Kane (2001) have proved that if the expectations of care are matched with the receipt of the same, it can certainly enhance the satisfaction of the elderly with care and wellbeing, particularly for the ones receiving long term care. Further, a study by Wielink et al. (1997) on the elderly living independently in the Netherlands revealed that with the extension of duration for care giving or requirement for personal care, the preference for informal care declines. Thus it becomes pertinent to assess the adequacy of health care infrastructure in accordance with the needs of the older adults.

In this background, the paper aims to assess the prevalence of multi-morbidities in a less explored setting of urban Rajasthan, India, among the population aged 50 years and above. Also, there is plenty of literature focused on various dimensions of health in the old age such as care giving framework, health care utilization and infrastructure (Mayhew 2000, Jung et al. 2003, Sheikh et al. 2015, Chokshi et al. 2016), however, studies investigating the preference of the elderly for health care facility are extremely rare. Whether older adults would prefer private doctors on government doctors or non-allopathic form of medicines such as Ayurveda, Yoga and Naturopathy, Unani, Siddha, Sowa-Rigpa and Homeopathy (AYUSH) (Rudra et al. 2017) or have no specific preference? This question becomes pertinent for the old age as the care preferences of the older may bridge the gaps between the receiver preferences and the giver decisions about the long term care planning (Reamy et al. 2011). Also, successful ageing is not only the freedom from disability but also the high cognitive, physical and social functioning (Rowe and Kahn 1987, Rowe and Kahn 1997). The paper also substantiates the preference of the elderly for health care facility by carrying out a quantitative as well as a qualitative analysis.

Methodology

Selection of the Study Area

Considering the subject matter and the objectives of the study, it was pertinent to collect primary data from Rajasthan focusing on its urban parts. With India emerging as one of the fastest growing economies, its eight states are still lagging behind i.e. Bihar, Jharkhand, Chhattisgarh, Madhya Pradesh, Rajasthan, Odisha, Uttarkhand, Uttar Pradesh grouped together as the Empowered Action Group (EAG) states to give them focused attention (Arokiasamy and Gautam 2008). Cumulatively, these states account for 46% of India's total population and 61% of the population living below the poverty line (Census of India 2011). Also, the health outcomes are worst in these states contributing to the highest disease burden in the country (Ministry of Health and Family Welfare 2011). Rajasthan, one of the EAG states, is also one of the four states selected for the pilot survey of the Longitudinal Ageing Study in

India (LASI) focused on the population aged 45 years and above; being pioneer in such longitudinal surveys in India. LASI is a large scale, nationally representative, longitudinal survey on ageing, health and retirement with an aim of analyzing population ageing and the formulation of mid and long term policies for India (Arokiasamy et al. 2012). As per the findings of the Census of India 2011, Rajasthan is the largest state by area and the eighth largest by its population size of 68 621 012 people. The state is also ill famous for its poor sex ratio of 928 compared to 943 at the country level reflecting its patriarchal social structure. It is worthwhile to mention that though the sex ratio is below the national average it has improved from 921 as per the Census of India 2001. Rajasthan has a density of 200 persons per square kilometer and a literacy rate of 66.11 overall and 79.68 in the urban areas (Census of India 2011). Further, it is a state still dominated by the rural population as only one fourth of its total population resides in urban areas (17 008 776 people); the study is based on the urban population of Rajasthan only.

Profile of the selected District

Rajasthan is the state with 33 districts and considering the profile of its districts, the city of Jaipur was selected as the study area. It is the capital city and commonly known as *Pink City* of India for its pink colored walled city. It also enjoys the status of being the first planned city of the country along with a rich cultural heritage. Apart from its historical roots, it is ranked at 10th place in terms of the largest urban agglomeration by population size in India (Census of India 2011) as well as one of the four cities of Rajasthan selected for the Smart city mission, the Government of India recognizing its pace of modernization. The Ministry of Housing and Urban Affairs launched this mission in 2015, aiming at the promotion of such cities that can provide core infrastructure and ensure a decent quality of life to its citizens, a clean and sustainable environment along with the application of 'Smart' Solutions (Ministry of Urban Development 2015). Further, the Ministry defines the focus of this mission on sustainable and inclusive development and creating a replicable model in compact areas to act like a light house to other aspirant cities; Jaipur being selected as one of the light house cities. Hence, it will be insightful to assess the health care needs and preferences of the older adults living in a light house city. Further, as per the Census of India 2011, 20.49% of the urban population of Rajasthan, i.e. 34 099 204 people, resides in urban Jaipur. The literacy rate in Jaipur district is 76.44 with 82.47 in the urban parts which is higher than the average literacy rate at the state level for overall and urban areas as well (Census of India 2011). Further, the per capita income of the city is € 461.54 (Government of Rajasthan 2015). This study is focused on the population aged 50 years and above living in the urban parts of Jaipur district which constitutes 11.55% of the total urban population of Jaipur i.e. 288 927 people (Census of India 2001). Since it is the work of an individual researcher and also there is hardly a study focused on Jaipur, this study therefore fulfills the research gap as well.

Sampling

The survey design of the study is finalized by following the Encyclopedia of Survey Research Methods edited by Lavrakas (2008) and other research based on primary data such as the work done by Banjare and Pradhan (2014); hence, a five stage sampling procedure was adopted to select the respondents from urban Jaipur. A brief description of the sampling design is given below:

1. The sample size[1)] was calculated using the sample size formula to arrive at a sample of 400[2)] older adults aged 50 years and above living in the urban parts of Jaipur:

1) This method requires a target precision for the estimates and a given design effect (with the adjustment for expected non-response) (Lwanga and Lemeshow 1991).

2) The sample size formula estimated the number of respondents at 362, but to ensure adequate cell frequency the sample size was inflated to 400.

$$n = \frac{Z_{\alpha}^2 * p * q * (1 + R) * (deff)}{d^2}$$

where, n = estimated sample size
α = level of statistical significance that was set at 0.05
Z_{α} = the z value at 95% confidence level i.e. $\mathbf{z_{\alpha}=1.96}$, with 95% confidence level
d = the margin of error i.e. **d=0.05**
p = the proportion of older adults aged 50 years and above i.e. **p=0.12**
q = 1-p i.e. **q=0.89**
R = non-response rate i.e. **R=0.10**
deff = design effect i.e. **deff=2**

2. In the second stage, it was purposively decided to collect data from five urban wards out of 91 wards divided into eight zones of Jaipur Municipal Corporation[3]. The wards were selected on the basis of their residential pattern so as to capture different socioeconomic segments of the population to the largest possible extent. It is however important to note that there is no official record stating the residential pattern and it is based on the observation of the researcher as well as on the findings from the pilot survey[4]. Hence, the information about the five selected wards is given in Table 1.

3. In the third stage, from each of the five wards, one census enumeration block (CEB) was randomly selected.

4. In the fourth stage, the operation of housing list was carried out in each of the selected CEB of five wards. The minimum eligibility criterion for listing the household was the presence of at least one person in the age group of 50 years and above in the household.

5. In the fifth stage, following the systematic random sampling, households were selected from each of the five CEBs using the household list. It implies that every fifth household listed on the household list was selected for the interview to ensure systematic randomness while selecting the sample.

Table 1

Information of selected wards (Urban Jaipur, 2012)

Ward Number	No of Households	Total population	Selected Area	Major Population Characteristic
Ward No 17	224	1415	Bani Park	Richer section
Ward No 27	9177	41058	Mansorover (SFS colony)	Retired government officials
Ward No 35	11895	58027	Jhalana	Lower income group
Ward No 38	6320	29333	Malviya Nagar	Business and teacher community
Ward No 54	6919	34534	Ramganj	Muslim population

Source: Directorate of Census Operation, Jaipur office; Jain and Arokiasamy 2016

3) See Appendix 1 for the ward map.

4) During the in-depth interviews at the time of the pilot survey, the elderly were asked about the residential pattern of the city.

Health care assessment

Since the study is based on primary data[5], a cross-sectional survey design consisting two sets of self-administered questionnaire, i.e. Household questionnaire and Individual questionnaire, were developed[6]. The former is used to collect information about the household and its members (such as ownership of household assets which is used to calculate the wealth index using the Principal component analysis), while the latter is used to collect specific information about the respondents (such as age, gender, education status, caste, religion). The data on the prevalence of various morbidities was collected by asking the elderly the following specific question: "*If any health professional has ever diagnosed them with a (particular) chronic disease or minor ailment in the last one year or last 30 days preceding the survey respectively*."

The responses were recorded without conducting any clinical or cross examination of medical reports. Further, consistent with the research carried out in the field of multi-morbidity (for example, Khanam et al. 2011, Arokiasamy et al. 2015), the study defined it as the simultaneous presence of two or more chronic conditions at the time of the survey based on the information collected on individual chronic diseases[7]. Further, in order to meet the second objective about the health care preferences, the elderly were asked the following questions according to the ailment: "*Which health facility do you prefer for health care and treatment seeking in case of any minor ailment? Which health facility do you prefer for health care and treatment seeking in case of any major illness?"*. The rationale for asking two separate questions was to rule out the probability of having different preferences for a different nature of disease. The reasons that shaped the preferences of the elderly for health care facility were also explored.

Data Processing

The field work for data collection from the 400 elderly aged 50+ was carried out in urban Jaipur during August 2012 to January 2013. The data so collected was then entered using the United States Census Bureau's Census and the Survey Processing System (CSPro) version 4.0.1 which is being widely used for processing of survey data. The data was entered as two separate files, i.e. Household file and individual file, which were later on merged with assigned unique identification codes and converted into STATA version 10 (Stata Corporation, College Station, Texas, USA) for the purpose of the analysis. It is important to note that the necessary editing and cleaning of data was undertaken before carrying out the analysis.

Statistical tool

Considering the objectives of the study, the uni-variate, bi-variate and multi-variate analyses were carried out[8]. The bi-variate associations are tested using the chi-squared goodness of fit statistics which is used as a test for counts and to determine how well each item contributed to a common dependent variable (Phaswana-Mafuya et al. 2013). In the multi-variate analysis, the Poisson regression model is applied as the prevalence of multi-morbidity turned out to be a rare event. Also, its use is justified based on the statistically significant value of the Wald chi-square statistic for the full model (p-value for the chi square) (Saikia and Ram 2010). A brief description of the model is as follows:

5) In primary data, information is collected and used for the first time by the investigator/ researcher.

6) See Appendix 2 and 3.

7) The information collected is used to estimate the prevalence of no disease, one disease and 2+ diseases.

8) See Appendix 4 for the demographic and economic profile of the respondents.

Poisson Regression Model: A Poisson random variable Y has the probability density function, f(y) = P(Y = y) given as,

$$f(Y_i) = \frac{e^{-\mu}\mu^{Y}}{Y!}$$

where, f (Y) denotes the probability that the variable Y takes non-negative integer values. The parameter μ is the mean value of the random variable Y which takes on values from zero to infinity, at integers.

The Poisson regression model may be written as:

$$Y_i = E(Y_i) + u_i = \mu_i + u_i$$

where the Y's are independently distributed as Poisson random variables with means μ_i for each individual expressed as (Gujarati 2009):

$$E(Y_i) = \mu_i = \{\beta_1 + \beta_2 x_{2i} + \beta_3 x_{3i} + \ldots + \beta_k x_{ki}\}.$$

Ethical Consideration and Informed Consent

This study is based on primary data collected from the older population aged 50 years and above living in the urban parts of Jaipur. A due attention is paid to the ethical considerations by taking a prior approval for the study and questionnaire from the International Institute for Population Sciences, Mumbai. Respondents were interviewed only after taking their informed consent wherein they were assured of keeping their identity anonymous and information shared as confidential. Also, their participation in the survey was voluntary and they were free to discontinue the interview at any point of time and they could choose not to answer the questions they did not like.

Results

Prevalence of Morbidities and Multiple morbidities

The first objective of the study is to assess the prevalence of various morbidities among the older population, defined in terms of morbidity, multi-morbidities and zero morbidity along with individual distribution of diseases (Fig. 2). The findings reveal that 28% did not report any disease while 40% suffered from one disease and 31% reported the prevalence of multiple diseases. Considering chronic diseases, the majority of elderly reported hypertension (39%) followed by diabetes (24%) and arthritis (23%). Angina and lung disorders were reported by 13% of the elderly. Further, less than 10% of the elderly suffered from heart diseases (eight percent); thyroid (four percent); spondylitis (three percent); genital ulcers (two percent); polio/ paralysis (one percent) and less than one percent complained about slip disc and cervical[9]. Among the minor ailments, problems related to vision were the most commonly reported (66%) followed by fatigue (44%), dental problems (40%) and prolonged cough (27%).

9) The reason for such less percentages was not the less prevalence of these diseases, but rather the elderly who were bed ridden were either unwilling for the interview or those who consented couldn't complete their interviews

Association of socioeconomic factors with the prevalence of morbidities

This section deals with exploring the crude associations of multi-morbidities with the socioeconomic and demographic characteristics of the elderly in order to identify the vulnerable groups (Table 2). As expected, the older adults reported comparatively a better health status defined in terms of zero morbidities and multi-morbidities than the oldest old (34% and 23% for zero morbidity and 25% and 37% for multi-morbidities for the population aged 50-59 years and 60+ respectively). In a patriarchal Indian society, females are often an ignored gender yet biologically stronger; hence, 33% of older males reported multi-morbidities compared to 28% of older females though the other two indicators preferred older males. Education and economic status depicts a positive association with multi-morbidities justified on the grounds of a reporting pattern shaped up by the awareness levels. Also, the percentage of older adults suffering from multi-morbidities was more among those living in non-nuclear families (33%) and belonging to other caste group (34%) and to the Hindu religion compared to their counter parts (24% for nuclear families and the deprived caste group and 27% for the Non-Hindu religion).

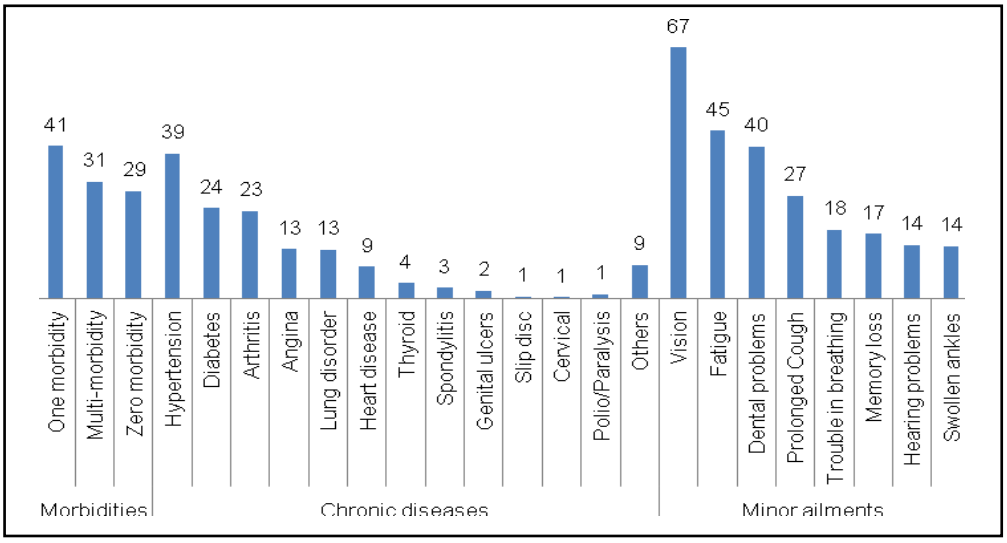

Fig. 2 **– Morbid conditions among the elderly aged 50 years and above (per cent distribution by morbidities, Urban Jaipur, 2013)**
Note: Percentage may add up to more than 100 because of multiple responses

Socioeconomic correlates of multiple morbidities

The crude associations were further explored using the sophisticated regression analysis. Table 3 presents the estimates from the Poisson regression model used to examine the determinants of multi-morbidities relative to the reference category “no morbidity”. The results are consistent with the patterns as indicated in the bivariate analysis. For instance, among the predictors, age, caste and the economic status of the elderly are of importance. Age has significant effect on the prevalence of morbidities as older adults aged 60+ have a 1.36 times higher risk of morbidity than those in the age group of 50-59 years. The effect of caste on the risk ratio is paradoxical as the elderly belonging to the deprived caste group experienced a 26% lesser risk ratio of morbidity than their counterparts. Similarly, the elderly from the households with medium and high standard of living experienced a 28% and 27% higher risk ratio of morbidity than the elderly from the low standard of living households.

Table 2

Prevalence of multiple diseases among the elderly, by socioeconomic characteristics (Urban Jaipur, 2013)

SES characteristics	Zero morbidity	One morbidity	Multi-morbidity
Age**			
50-59 years	34.17	41.21	24.62
60+ year	22.89	39.80	37.31
Gender			
Male	29.55	37.65	32.79
Female	26.80	45.10	28.10
Educational level*			
No education	27.27	47.27	25.45
Up to higher secondary	30.10	41.75	28.16
Graduation	31.16	41.30	27.54
Post-graduation and above	24.04	34.62	41.35
Working status***			
Currently working	36.36	40.64	22.99
Retired	22.64	35.85	41.51
Not working	20.56	44.86	34.58
Living Arrangement			
Nuclear	31.33	44.58	24.10
Non-Nuclear	27.76	39.43	32.81
Caste***			
Others	23.91	42.03	34.06
SC/ST/OBC	38.71	37.10	24.19
Religion*			
Hindu	30.40	36.63	32.97
Non-Hindu	24.41	48.82	26.77
Wealth**			
Poor	34.33	44.78	20.90
Middle	27.07	36.09	36.84
Rich	24.06	40.60	35.34
Total	28.50	40.50	31.00

*Notes: ***significant at 1% level of significance (p<0.01); **significant at 5% level of significance (p<0.05); *significant at 10% level of significance (p<0.10), as per the Chi-squared test results.*

Overall, the elderly belonging to the forward caste group (non-SC/ST/OBC) and the non-poor households in the age group of 60+ were at a higher risk of morbidities. The results derived consistency with the literature that with poor socio-economic standing sometimes an individual's own understanding of health may not be in accordance with the appraisal of medical experts and thus they fail to realize the presence of a morbid condition and they do not report it (Sen 2002, Jain et al. 2012).

Preference for health care facility

There is a plethora of literature focused on the various dimensions of health such as health care infrastructure and their adequacy and availability (Sheikh et al. 2015, Chokshi et al. 2016);

however, studies exploring the preference of people for health care facility are relatively rare. Since the old age needs much of health care, the knowledge about their preferences would certainly assist in designing the appropriate type of health care infrastructure. When in this

Table 3

Poisson regression results (IRR) showing the effect of socioeconomic and demographic predictors on the prevalence of multiple morbidities among the elderly aged 50+ (Urban Jaipur, 2013)

Morbidity	IRR	95% Confidence Interval	
		Lower Limit	Upper Limit
Age			
50-59 Years®			
60+	1.38***	1.15	1.65
Educational level			
No education®			
Up to secondary	0.89	0.66	1.21
Graduation	1.02	0.69	1.52
Post-graduation & above	1.26	0.86	1.87
Gender			
Male®			
Female	0.91	0.77	1.09
Caste			
Other Caste®			
SC/ST/OBC	0.74***	0.61	0.92
Religion			
Hindu®			
Muslim	1.04	0.79	1.37
Others	0.95	0.78	1.16
Living Arrangement			
Nuclear®			
Non-Nuclear	1.19	0.96	1.49
Economic Status			
Poor®			
Middle	1.36**	1.07	1.73
Rich	1.37**	1.05	1.78
Constant	0.88	0.57	1.36
N	400		
Wald Chi-Square (13)	**50.8**		
Prob> Chi-Square	**0.000**		
Pseudo R Square	**0.0353**		

*Notes: ***p<0.01; **p<0.05; *p<0.10;*
®: reference group;
IRR: Incidence Risk Ratio.

study the older adults were asked about their preference for the type of health care facility, their response varied with the types of morbidities (Table 4). To illustrate this, 42% of them preferred the government hospitals for the treatment of chronic diseases (42%) while for minor

ailments, the majority preferred home remedies on any other health care facility (31%). Despite increasing the consumption of allopathic medicines, AYUSH still managed to be a preferred option by 14% of the older adults for minor ailments. Further, 15% and three percent of the respondents did not have any specific health care preference for chronic and minor morbidities respectively.

Table 4

Most preferred health care facility by type of ailment (Urban Jaipur, 2013)

Health facility	Chronic diseases	Minor ailments
Government Hospitals/Clinics	42.50	22.50
Community/Charity Centers	#	3.00
Private practitioners/Hospitals	33.75	17.00
AYUSH	0	14.50
Pharmacy/Drug Store	NA	8.50
Home Remedies	NA	31.50
NGO/Trust Hospitals	7.00	0
No Specific Preference	15.50	3.00

Note: # cell frequency is less than 8

While responding to the question of preference for health care facility, a few of the older adults (31%) expressed their strong inclination for a particular health care facility irrespective of the nature of ailment (Table 5). Fourteen percent of the elderly have always preferred the government hospitals or clinics followed by 10% of the elderly with the preference for private hospitals and seven percent for NGO/Community hospitals. Sixty nine percent of the elderly did not have any specific preference and they were quite flexible with their choice of health care facility.

Table 5

Percentage of the elderly with fixed preference for health care facility (Urban Jaipur, 2013)

Fixed preference	Percent	N
Government Hospitals	14.25	57
NGO/Community/Charity Hospitals	7.00	28
Private Hospitals	9.75	39
Flexible preference	69.00	276

Factors governing the preference for health care facility

Though the elderly have revealed their preference for health care facility, it would be insightful to understand the factors responsible for shaping up such preferences in order to ascertain the strengths and weaknesses of the exiting health care infrastructure (Fig. 3). The availability of better facilities (32%) and best doctors (23%), as well as affordability (23%), was amongst the most commonly reported factors. The facilities of reimbursement and CGHS hospitals also emerged as factors for seven and four percent of the elderly respectively. It is important to note that none of the older adults covered under the CGHS scheme have preferred any other health care facility except the CGHS approved health care facility; hence, there is a need to expand the social security benefits. It was also observed that the choice for a particular health care facility emerged on the account of refusal to other facility. For instance, nine percent of the

elderly did not visit a particular health care facility owing to lack of adequate infrastructure; however, they were indifferent to any other facility. Likewise, two percent of the elderly did not visit a health care facility as they believed providers to be dishonest.

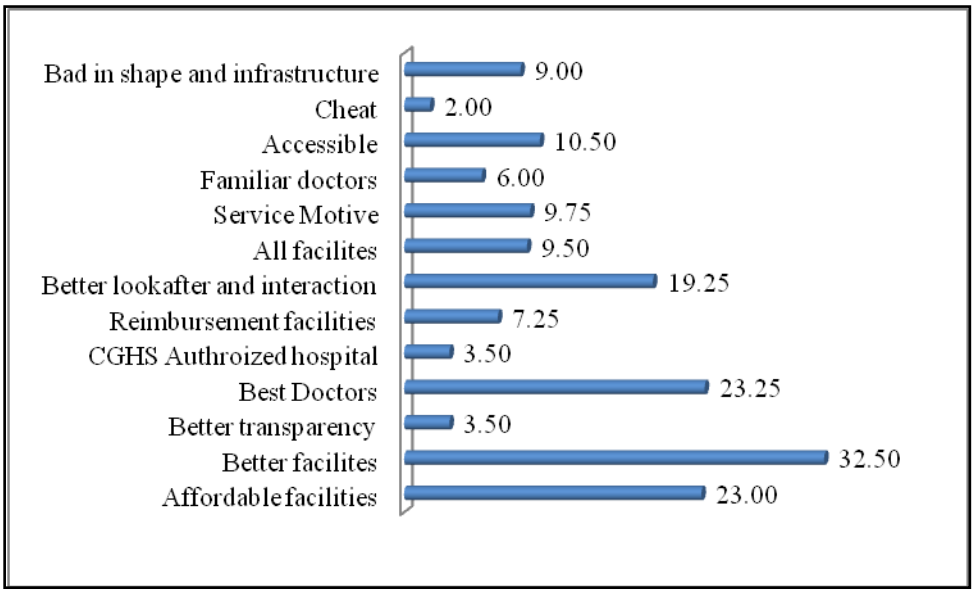

Fig. 3 **– Factors governing the preference for the health care facility (Urban Jaipur, 2013)**

The factors shaping up the preferences were re-analyzed by the type of health care facility to evaluate such facilities from a consumer's view point (Table 6). The majority of the elderly who preferred government facilities rationalized their choice based on the availability of best doctors (61%) followed by the affordable facilities (37%) and a belief that these hospitals are governed by service motive (18%). Likewise, in the context of NGO/Charity facilities, 50% of the elderly preferred it because they believed facilities to be better while 18% chose this facility owing to its accessibility. Fifty six percent of the elderly who preferred the private health care facility were governed by the availability of better facilities and look after while 23% of them preferred it due to the lack of proper infrastructure in other health care facilities; hence, the weakness of other health care providers led older adults to prefer private providers.

The quantitative analysis has clearly brought out the factors shaping the preferences; the qualitative excerpts would however allow us to explain their rationale; for instance, a married male aged 64 years and an elderly widow aged 79 years narrated their reasons for preferring the government hospital:

"The reliability of the private hospitals is very suspicious… they are sitting there to make money… but government doctors are much more qualified and have service motive… they won't make us to go for unnecessary tests..." [Married male, 64 years].

"Doctors in government hospitals don't listen to us properly… there are such long queues and it becomes difficult for me to wait… but I have no choice… I am dependent on my kids after their uncle's death… I have to go where there are lesser fees…" [Elderly widow, 79 years].

These two elderly preferred government hospitals however their reasons differ considerably; for the former, good facilities are shaping the preference as well as the lack of trust on the other health facility while for the latter there is no willingness to prefer this hospital, but owing to lesser fees, she was forced to. Likewise, there were few more respondents who did not like a particular health facility and so they either chose another or they were forced to visit the same health care facility.

Table 6

Percent distribution of the elderly according to the preferred health care facility by their reasons (Urban Jaipur, 2013)

Reasons	Facilities			
	Government	NGO/Charity	Private	Not specific
Affordable facilities	36.84	28.57	0	22.83
Better facilities	17.54	50.00	56.41	30.43
Better transparency	#	#	#	#
Best Doctors	61.40	10.71	0	19.93
Reimbursement	12.28	#	#	11.23
Better look after and interaction	5.26	#	56.41	17.03
All facilities	17.54	0	0	10.14
Service Motive	17.54	14.29	0	9.06
Familiar doctors	0	10.71	#	6.52
Accessible	#	17.86	0	12.68
Cheat	#	0	0	#
Bad in infrastructure	0	14.29	23.08	8.33

Note: # cell frequency is less than 8

Discussion

Ageing and healthy ageing are two separate issues; the former is bound to happen beyond the control of governments while the latter is to be ensured by policymakers. By now, ageing has hit most of the countries and a crossover of an increasing older population and a declining child population is projected when the number of children and older persons will be the same (United Nations 2006). Both these sub-groups are the largest consumers of health services though they need an all together different health care infrastructure. Hence, it is of utmost importance to carry out systematic studies dealing with the different dimensions of population ageing such as financial needs, wellbeing, and health care infrastructure to assist policymakers in formulating effective policies and interventions. In the context of India, there is limited literature on the socioeconomic correlates of multi-morbidities among the elderly population (Himanshu and Talukdar 2017) and this study has attempted to fill this research gap by providing insights upon Rajasthan, the largest state of India. The findings from the study reveal that multi-morbidities are reported by 31% of the elderly; however the prevalence of only a single morbidity is reported among 41% of the study population which reflect the risk group for multi-morbidities. Thus, the burden on health care resources appears to be increasing in the near future. The study also identified the vulnerable groups that need targeted attention. For instance, the older adults belonging to the non-SC/ST/OBC group and to non-poor households in the age group of 60+ were at a higher risk of multi-morbidities. Though it does not entail for the immunity of their counterparts from multi-morbidities, it should rather be understood in the terms of deciding a starting point for the targeted intervention.

A comparison of the results with the available literature divulges into some contradictory as well as similar results. A study carried out in Chandigarh found the elderly females more prone to morbidities (Swami et al. 2002) but in Karnataka no gender differentials were observed (Shraddha et al. 2012) while this study found a lesser prevalence of multi-morbidities among the elderly females in urban Rajasthan. In addition, consistent with the findings of Banjare and Pradhan (2014), Ha et al. (2015) and Mini and Thankappan (2017), this study also revealed a higher prevalence of multi-morbidities among the well-off section of the society. Further, since India is in the early stages of establishing government programs to support its aging population (Arokiasamy et al. 2012, Jain and Arokiasamy 2016), exploring the preferences of the elderly for health care infrastructure would be insightful. This study shows an inclination towards government hospitals as 14% of the older adults have always preferred government hospitals or clinics while nearly 10% preferred the private hospitals. It is worthwhile to mention that the entire group of older adults covered under the CGHS scheme has always preferred those hospitals affiliated with the scheme; hence, there is 100% acceptance and utilization of the scheme among masses.

The study acknowledges that each country has its own pace of demographic transition and urbanization. The initiatives taken by the developed world such as the restructuring of policies, pension plans and health care infrastructure to ensure successful ageing can still be suggestive of effective policies though they should be modified and adopted according to their own needs. In fact, the state based care options prevailing in Europe differ by scope, organization and quality within the European countries. So that, in Sweden and the Netherlands, health care infrastructures are funded by the state, while Switzerland employs a local system of services and the Denmark represents the example of a public-private policy of both pensions and savings (Davey et al. 2014, Smits et al. 2014, Mair et al. 2016). Similarly, the Stockholm European Council defined a three-pronged strategy to address population ageing through: 1) reducing public debt, 2) raising employment rates and productivity, and 3) reforming pension, health care and long-term care systems (European Commission 2014), while Lee and Mason (2006) believed that European policies should now be designed to exploit the ‘second demographic dividend’. India is though in the stage of reaping its first demographic dividend; however, considering the pace of transitions occurring concomitantly, the government should integrate the elements of these lessons in its ageing policies, particularly focusing on health and long term care systems.

Conclusions

The essence of this paper lies in assisting the government to provide for adequate health care infrastructure for the elderly by exploring the prevalence of morbidities and multi-morbidities as well as the preference of the elderly for health care facility shaped up by their reasons in an urban set up. The study recommends the government to keep in mind the preferences of the older adults while designing appropriate geriatric hospitals. Though there was an inclination towards government hospitals, in few instances, there was observed that, apart from quality, lacunas in the non-government health care providers left the older adults with this option which remains valid for choosing a different health care provider in other instances as well. Thus, the burden of government doctors should be reduced by either hiring more staff or creating more hospitals; also, there should be some stringent regulations to monitor the functioning of private providers. The recent incidence of sheer negligence by some big private providers in few cities of India calls for strict actions by the government to avoid such incidences in the future where the possibility of under reporting cannot be ignored. The insight gleaned from the study strongly suggests the expansion of coverage under the insurance schemes (such as CGHS) at least in the urban areas where these schemes have already become popular. Hence, if the inhibiting or promoting factors can be rectified or strengthened, the shape of health care infrastructure will be in accordance with the needs of the elderly.

The study is though based on the data collected from the urban areas of the largest state of India. So that, it would be unjust to generalize the findings for the whole country, but still, the prevalence of morbidities and the preference for health care facility can assist the government in predicting future health care needs and the type of infrastructure required to cater to such needs. Also, the scenario depicted in urban areas can be indicative of the quantum of health care needs in the rural areas where under-reporting is a major issue due to widespread illiteracy and unawareness about the morbid conditions.

Finally the study concludes by an urge to alter the assumption of considering the older population as a burden on resources, and the concept of successful ageing can certainly assist us in this drive. If their health needs are adequately addressed, this sub-group of population is a rich source of experiences which none of the text books can ever teach.

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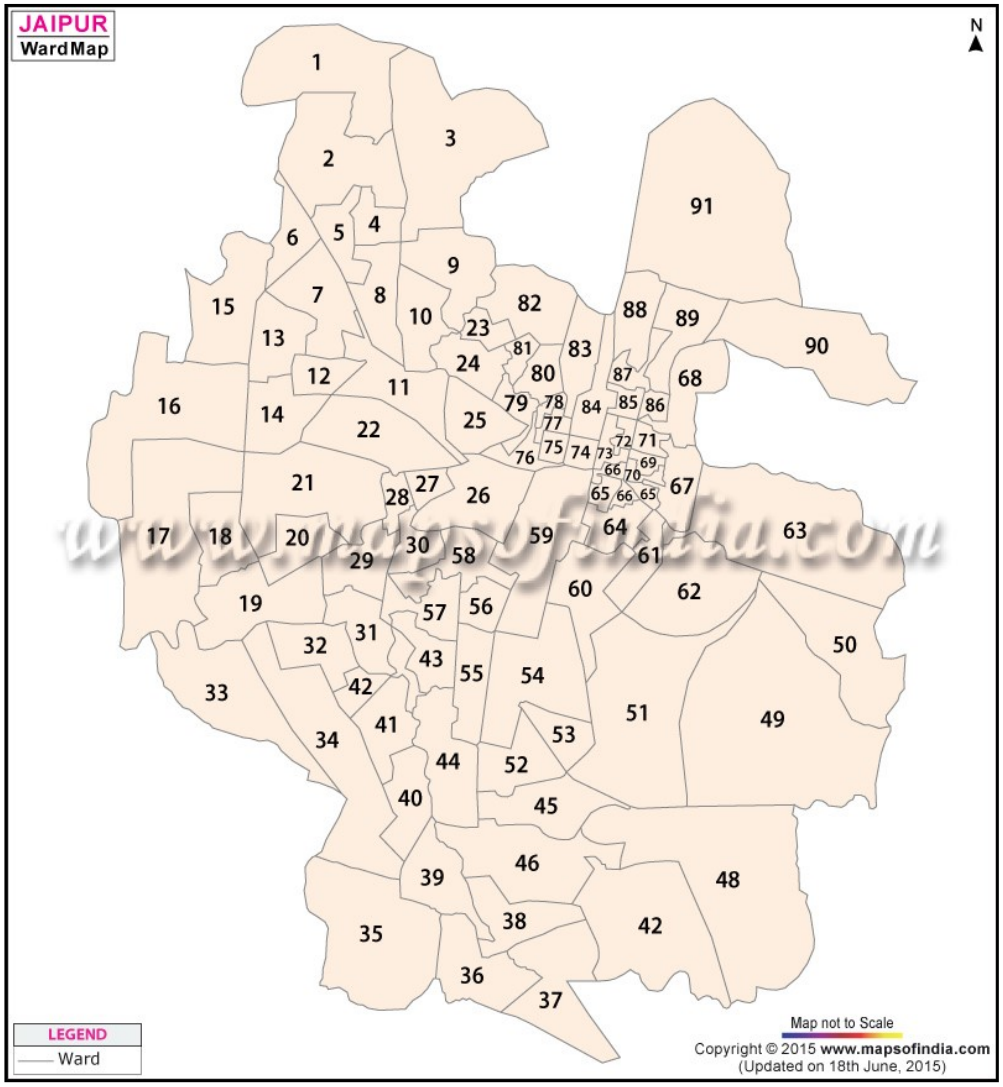
APPENDICES

Appendix 1



Ward Map of Jaipur

Appendix 2

Household schedule

Now I would like to have some information about the people who usually live in your household (HH). (Please add sheets and columns if more members are in the household).

LINE NO 001	**USUAL RESI-DENTS OF THE HH**	**RELATION-SHIP WITH THE HEAD OF THE HH**	**SEX**	**AGE**	**MARITAL STATUS**
	Q 102	Q002	Q003	Q004	Q005
	Please tell me the names of the person who usually lives in your HH starting with the head of the HH	What is the relationship of (NAME) to the head of the household? **(A)**	Is (NAME) male or female M=1 F=2	How old is (Name)? (Completed year) **(B)**	What is the current marital status of (name)? NM=1 CM=2 S/D=3 W=4 MNG=5 **(C)**
01					
02					
03					
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					

LINE NO 001	**EDUCATION (If Age>/ 5 years)**			**IF EVER ATTENED SCHOOL/ COLLEGE**		
	Q006	Q007	Q 008	Q 009	Q 010	Q 011
	Can (Name) read and write? Yes=1 No=0	Has (Name) ever been to school Yes=1 No=0 **IF YES GO TO Q 010**	If never attended school What is the main reason (Name) went to school? **(D)** **(GO TO NEXT PERSON)**	What is the highest standard (Name) has completed? **(E)** **IF AGE IS 18 YEARS OR MORE GO TO NEXT PERSON**	IF AGE IS LESS THAN 18 YEARS Is (Name) still in school/ college? Yes=1 No=2 **IF YES GO TO NEXT PERSON**	IF NOT IN SCHOOL/ COLLEGE What is the main reason (Name) not going to school/ college? **(F)**
01						
02						
03						
04						
05						
06						
07						
08						
09						
10						
11						
12						
13						
14						
15						

LINE NO 001	**WORKING STATUS**			**IDENTIFICATION OF ELGIBILE ELDERLY**
	Q 012	Q 013	Q014	Q 015
	What is the current working status of (Name)? CW=1 S/C/P=2 R=3 HM=4 SJ=5 NW=6	IF (NAME) IS WORKING Is (Name) in full time or part time em-ployment FT=1 PT=2	What is the nature of employment? GS=1 Inst=2 N/T=3 CS=4 PS=5 SE/ Bus=6 O=96	Write (1) if **Elderly Person** above age 50 years and (2) for others. Also Circle Line No of Eligible Respondents
01				
02				
03				
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				

A. CODES for Q103 **Relationship With the Head of the Household** 1= Head 2= Wife or husband 3= Son or daughter 4= Son-in-law or daughter-in-law 5= Grandchild 6= Parent 7= Parent-in-law 8= Brother or sister 9= Brother-in-law or sister-in-law 10= Niece or nephew 11= Other relative 12= Adopted/ Foster Child/ Step Child 13= Domestic servant 14= Other not related 98= Don't know	**B. CODES for Q105** **Age** 00= Age less than one year	**C. CODES for Q106** **Marital Status** 1= Never Married 2= Currently married 3= Separated / Deserted/ Divorced 4=Widowed/ Widower 5=Married but gauna not performed	**D. CODES for Q109** **Main Reasons:** 1= School too far away 2= Transport not available 3= Education not considered necessary 4= Required for household 5= Required for work on farm/ family 6= Required to work outside to earn 7= Expensive 8= No proper school facilities for girls 9= Required to care for younger siblings 10= Not interested in studies 96= Any other reason (Specify) 98= Don't know

E. CODES for Q110	**F. CODES for Q112**	**G. CODES for Q113**	**H. CODES for Q114**	**I. CODES for Q115**
Standard 00= Less than one year of education Otherwise actual standard	**Main Reasons:** 1= School too far away 2= Transport not available 3=Further Education not considered necessary 4= Required for household 5= Required for work on farm/ family 6= Required to work outside to earn 7= Expensive 8= No proper school facilities for girls 9= Not safe to send girls 10= Required to care for younger siblings 11= Not interested in studies 12= Repeated failures 13= Got married 96= Any other reason (Specify) 98=Don't know	**Work status** 1= Currently working 2=In school/ college/ professional courses 3= Retired 4= Homemaker 5= Searching for job 6=Not working	**Type of work** 1=Full time work 2= Part time work	**Nature of employment** 1= Govt Sector 2= Institution 3= NGO/ Trust 4= Cooperative Society 5=Private Sector 6= Self employed/ Business 96=Others (Specify)

HH 016	What is the religion of the head of the house-hold?	1 Hindu 2 Muslim 3 Sikh 4 Christian 5 Jain 96 Other (Specify) 98 Don't know	
HH017	What is the caste or tribe of the head of the house-hold?	1 Scheduled Caste 2 Scheduled Tribe 3 Other Backward class 4 General 96 Other (Specify) 98 Don't know	
HH018	What is the language you generally speak at home or languages you know?	1 Hindi 2 English 3 Marwari/ Rajasthani 4 Punjabi 5 Urdu 6 Bengali 7 Sindhi 96 Other (Specify)	
HH019	Have you always lived in this city?	1 Yes → HH021 0 No	
HH020	How long have you been living in this area?	Months Years	
HH021	Note the type of house	1 Kaccha House 2 Semi- kuccha house 3 Pucca house	
HH022	How many rooms are in your home excluding bathrooms, porches, balconies or hallways but including kitchen?	Number of rooms If only one room → HH025	

HH023	Of these rooms, how many are used for sleeping?	Number of rooms	
HH024	Do you have separate room for kitchen?	1 Yes 0 No	
HH025	What is the main source of drinking water for the household?	1 Piped water 2 Water from spring 3 Rainwater 4 Tanker 5 Bottled water/ purchased water 96 Any other (Specify)	
HH026	What type of toilet facility do members of your household use?	1 Flush or pour flush toilet 2 Pit latrine 3 Pit ventilated improved (VIP) biogas latrine 4 Pit latrine with slab 5 Pit latrine without slab/Open pit 6 Twin pit/composite toilet 7 Dry toilet 8 No facility, use open space 96 Other (Specify)	
HH027	What type of fuel does your household use for cooking?	1 Liquefied petroleum gas (LPG) 2 Compressed Natural gas (CNG) 3 Kerosene/ Electric 4 Biogas/ Solar energy 5 Coal/lignite/ Charcoal/ Crop residue/ burning wood/ dung cake 96 Other (Specify)	

HH028	Does your household have the following:		

Assets	**Yes**	**No**
Refrigerator	1	0
Washing Machine	1	0
Sewing Machine	1	0
Television	1	0
Mixer	1	0
Pressure Cooker	1	0
Dishwasher	1	0
Telephone	1	0
Mobile Phone	1	0
Radio/Transistor/ Stereo System/ CD Player	1	0
Computer	1	0
Air Conditioner	1	0
Cot or bed/ Mattress	1	0
Electric Fan	1	0
Cooler	1	0
Car/ any four wheeler	1	0
Motorcycles/ Scooter/ Mopeds	1	0
Bicycles	1	0

Thank you for your cooperation and giving your precious time.

Appendix 3

Individual questionnaire

Variables	Questions and Filters	Coding Categories	Skip/Go to
D001	Note down the sex of the respondent	1 Male 2 Female	
D002	What is your current marital status?	1 Never Married 2 Married 3 Separated/ Deserted 4 Divorced 5 Widowed	
D003	Tell me the living arrangement of your house	1 Living Alone 2 Living with spouse only 3 Living with spouse and children or others 4 Living without spouse but with children or others 5 Living with others	→ D005A
D004	Can you please tell me why are you staying alone?		
D005	What is your date of birth? In which year and month were you born?	Don't know 98 98 98 D005A Day of birth D005B Month of birth D005C Year of birth	→ D007
D006	How old were you on your last birthday? Compare and correct D005 and D006 if inconsistent		
D007	Can you read and write?	1 Able to read only 2 Able to write only 3 Able to read and write 4 Cannot read or write	

D008	What is the highest level of education that you have completed?	0 No education 1 Primary 2 Secondary 3 Higher secondary 4 Diploma/ Certificate course 5 Graduation 6 Post graduation or above	
D008A	Years of schooling	0 to 40 years	
D009	What is your current working status?	1 Currently working 2 Re-employed after retirement 3 Retired 4 Home-maker 5 Unable to work 6 Not working	→ D016
D010	Where are/were you working before retirement?	1 Government sector 2 Institution 3 Cooperative society/ cooperation/ NGO/ Trust 4 Private sector 5 Business 6 Self employed/ 96 Others	

Health care utilization

HS001	How do you rate your current health status?	1 Excellent 2 Fairly Good 3 Normal 4 Poor (Sick) 5 Bad (Bed Ridden) 98 Don't know/ Can't say 99 Refuse to answer	
HS002	What is your current health status as compared to last month?	1 Improved 2 Same/ no change 3 Worsened 98 Don't know/ Can't say 99 Refuse to answer	
HS003	What is your current health status as compared to last one year?	1 Improved 2 Same/ no change 3 Worsened 98 Don't know/ Can't say 99 Refuse to answer	
HS004	Which health facility do you prefer for health care and treatment seeking in case of any minor illness?	1 Government clinics 2 Community/ charity centers 3 Private Practioners 4 AYUSH (Ayurvedic, Siddha, Homeopathy, Unani) 5 Pharmacy/ Drug store 6 Home remedies 7 No specific preference 99 Refuse to answer	
HS005	Which health facility do you prefer for health care and treatment seeking in case of any major illness?	1 Government hospitals 2 Community centers 3 NGO/Charity hospital 4 Private hospitals 5 No specific preference 99 Refuse to answer	

HS006 — What are the factors that govern your preference?

1	Affordable facilities
2	Better facilities
3	Less corruption
4	Best doctors wherever available
5	CGHS authorized hospitals
6	Reimbursement facilities
7	Better look after and interaction
8	Availability of facilities
9	Service motive
10	Familiar doctor or known people
96	Other

HS007 — Are you going for health check up?

1	Yes, regular
2	Often
3	Rarely/occasionally
0	No

HS008 — Have you been diagnosed by any health professional from any of the following ailment in last 30 days:

Disease	Yes	No
a Cough	1	0
b Fatigue	1	0
c Hearing problems	1	0
d Problem in vision (cataract etc)	1	0
e Dental/tooth problem	1	0
f Skin problem	1	0
g Trouble breathing	1	0
h Memory loss	1	0
i Swollen ankles or feet	1	0

HS009 — Has any of the health professional diagnosed you with:

Disease	**Y**	**N**
a Hypertension	1	0
b Diabetes	1	0
c Angina	1	0
d Arthritis	1	0
e Lung disorder (eg. asthma)	1	0
f Heart disease (eg. cholesterol)	1	0
g Thyroid	1	0
h Spondylitis	1	0
i Genital ulcers /Painful urination	1	0
j Slip Disc	1	0
k Cervical	1	0
l Polio/ Paralysis	1	0
m Any other (Specify)	1	0

If no, HS012

HS010	Are you taking any treatment for your disease?	1 Yes, on regular basis 0 No	→ HS012
HS011	Why are you not seeking treatment or go to the hospital?	1 Monetary issues 2 Illness was not serious 3 Disease can't be cured so no use of treatment 4 No willingness to go 5 Have faith on almighty 6 Have medicines at home/ self treatment 96 Any other reason (specify) 99 Refuse to answer	
	Now I would like to ask questions about your most recent visit to a medical facility (in the past thirty days), pharmacist or healthcare provider (HS012 to HS021)		
HS012	Within the past thirty days have you visited any medical facilities, pharmacist or healthcare provider?	1 Yes 0 No	→ HS018A
HS013	Which health care facility did you visit the last time you went?	1 Government hospitals/ clinics 2 Community centers 3 NGO/Charity hospital 4 Private hospitals/clinics 5 AYUSH (Ayurvedic, Siddha, Homeopathy, Unani) 6 Pharmacy/ Drug store	
HS014	Who accompanied you?	1 Family member 2 Friend 3 Relative 4 Someone else 5 No one	
HS015	Did your provider prescribe medicines at the visit?	1 Yes 0 No	→ HS018A
HS016	Did you obtain the medicine?	1 Yes 0 No	→ HS018A

HS017	Why you did not obtain the medicine?	1 Did not have money 2 Unable to find medicine 3 Medicine was at home 4 Did not think medicine was effective 96 Any Other (specify)	
HS018	Overall, in general how are you largely meeting your medical expenditure?	A By own savings YES 1 NO 0 B By pension/ income C Borrowing D Met by commercial insurance E Met by family insurance F Availing government facilities or employer facilities G Dependant on family H Any other	
HS019	Overall, how is the quality of medical care that you receive?	1 Excellent 2 Very good 3 Average 4 Poor 5 Pathetic/ very poor	

Thank you for your cooperation and giving your precious time.

Appendix 4

Demographic and economic information of sample population
(Urban Jaipur, 2013)

	Percent	**N**		**Percent**	**N**
Age			**Insurance coverage**		
50-54	31.83	127	CGHS	18.73	47
55-59	18.05	72	State Government	23.51	59
60-64	16.04	64	Medi-claim Policy	22.31	56
65-69	13.28	53	Employer Reimbursement	7.57	19
70-75	11.03	44	Private Health Insurance	3.98	10
76 and above	10.00	40	Private Life Insurance	14.34	36
Gender			Govt life insurance	21.91	55
Male	61.75	247	Family Insurance	3.98	10
Female	38.25	153	No cover	37.25	149
Education level					
Male				**Mean**	
No education	4.05	10	**Average Household size**	4.75	
Up to primary	6.88	17	**Average Household income**	52689.57	
Up to secondary	3.24	8	**Average Household expenditure**	21913.12	
Up to higher secondary	7.29	18			
Graduation	44.94	111	**Mean age (Standard deviation)**	61.16 (± 9.2370)	
Post graduation or above	33.60	83			
Female					
No education	29.41	45			
Up to primary	16.34	25			
Up to secondary	15.03	23			
Up to higher secondary	7.84	12			
Graduation	17.65	27			
Post graduation or above	13.73	21			
Social group					
SC/ST	13.50	54			
OBC	17.50	70			
General	69.00	276			
Religion					
Hindu	68.25	273			
Muslim	11.50	46			
Jain	14.50	58			
Others	5.75	23			
Total	**100**	**400**			