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Health status at 60 plus: National Reality from NSS 71st round data

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ABSTRACT

Indian population is growing larger and older due to social and economic development, development in public health, and modern medicine. Providing essential health care and social care to this increasing older population is of great concern for developing societies like India. This study looks at the determinants of health status of elderly in India using multivariate analysis. The results show that elderly experience a greater burden of ailments as compared to other age groups. morbidity prevalence patterns by age clearly indicates that the elderly experience a greater burden of chronic as well as short duration ailments compared to other age groups, across genders and residential locations. Socio-economic variables, especially the economic conditions and living arrangements of the elderly influence their chance of getting health care in the institutional set up (Hospitals). The study points to the urgent need of extending assistance to the need of elderly especially in the form of providing financial risk protection for health care in the form of Insurance coverage.

***Keywords*:** Elderly, Morbidity Prevalence, Ailment, Hospitalization, Chronic illness, Health Insurance, India, Monthly Per Capita Consumption Expenditure (mpce).

1. INTRODUCTION

The population of India is not only growing larger but it is also becoming older. The share of elderly population (aged 60 years or above) in total population has increased from 7.2% in 2003 to 8.3% in 2013, with males marginally lower at 7.8% than females at 8.8%. (Source: SRS, RGI). Among the bigger states the proportion varies from around 6.2 % in Assam to 13.5% in Kerala. As per United Nations projection 21% of the Indian population will be 60plus by the year 2050. Population aging in India can be considered as a result of social and economic development, development in public health, and modern medicine. Rapidly increasing life expectancy coupled with higher rate of infertility leads to more number of aging people. Life expectancy at birth, in rural areas, has steadily gone up from 48 years in 1970-75 to 66.3 years in 2009-13, while in urban areas it has increased from 58.9 years to 71.2 years during the same period. Life expectancy at the age of 60 years, during the same period, has increased from 13.5 to 17.5 years in rural areas and from 15.7 to 19.1 years in urban areas. Female has a higher life expectancy both at birth and at the age of 60 years. Among the Indian states, Kerala, where the proportion of aged in total population is highest, has also the highest life expectancy at birth for its population. In addition to the rapid demographic change, increased number of nuclear family due to urbanization and migration also threw the increased problem of financial and physical support towards the marginalized section of the elderly population. The old-age dependency ratio climbed from 10.9% in 1961 to 14.2% in 2011 for India as a whole.

Old age comes with lot of ailment and diseases. Comparison of data of NSS 60th Rounds (2004) and 71st round (2014) suggest a general increase in the reports of ailments and utilization of healthcare services among the elderly. An analysis of morbidity patterns by age clearly indicates that the elderly experience a greater burden of ailments as compared to other age groups. The increasing number of aging population thus put increased demand on health care and social care systems in the country.

Population aging creates major challenges for government that strive to provide universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all as stated in target 3.7 of Sustainable Development goal for Health.With the increasing trend of elderly population and a definite shift from communicable to non-communicable diseases, country needs an optimal and comprehensive health care system for the elderly. The Ministry of Health and Family Welfare, Govt of India launched the National Programme for Health Care of the Elderly (NPHCE)during the year 2010-11, in the 11thplan period with a vision to provide accessible, affordable, and high-quality long-term, comprehensive and dedicated care services to an ageing population. It was envisaged in the programme to provide free, specialized health care facilities exclusively for the elderly people through the State health delivery system. However, the progress of the programme is very slow as of now. This paper looks at the status of health of the elderly from the point of view of accessibility and affordability of the elderly for the health care and also data gaps from the point of view of more targeted decision making.

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2. Data

Survey on social consumption: Health in the 71st round of the NSS provides data on prevalence rate of deferent disease, the across version age – sex groups in different region of the country, use of medical facility, hospitalization and related details for the general population for 2014. This part of the survey has been used to extract data for the elderly. In addition, there is a special module on the elderly, which provides data on the various aspects of the elderly: these pertain to state of economic independence (whether dependent on others, partially or fully dependent on others), person supporting the person (whether spouse, own children, grand-children or others), living arrangements (living alone in old age home, living alone, living with spouse and other members, living without spouse but with children/other relations/non-relations) physical mobility, current state of health, *etc*. These informations have been used extensively in this analysis.

Brief on NSS 71st round

71st round of NSS survey on Social Consumption: Health took place during January - June 2014 in two sub rounds each of duration of three months. A stratified multi-stage design was adopted for the 71st round survey. Census villages (Panchayat wards in case of Kerala) in the rural sector and Urban Frame Survey (UFS) blocks in the urban sector formed the first stage units (FSU) whereas households in both the sectors were the ultimate stage units (USU). Stratum had been formed at district level with two basic strata (i) rural stratum comprising of all rural areas of the district and (ii) urban stratum comprising of all the urban areas of the district. However, within the urban areas of a district, each town with population 1 lakh or more as per Census 2011 formed a separate basic stratum and the remaining urban areas of the district had been considered as another basic stratum. Both in the rural and the urban sector, from each stratum/sub-stratum, FSUs were selected by Probability Proportional to Size With Replacement (PPSWR), in rural sector size being the population of the village as per Census 2011 and in the urban sector size being the number of households of the UFS Blocks. Both rural and urban samples were drawn in the form of two independent sub-samples and equal number of samples was allocated among the two sub rounds. Three second stage stratum (SSS) were formed as per following criteria:

SSS	Composition of SSS within a sample FSU
1	households having at least one child of age less than 1 year
2	from the remaining, households with at least one member (including deceased former member) hospitalized during last 365 days
2	other households

From each SSS, the sample households were selected by SRSWOR.

Socio economic status of elderly

As per NSS 71st round, of the 7.8% of the population who are elderly, 69% live in villages. Almost half of the Indian elderly are males. There are 1035 elderly females in rural India and 1027 elderly females in urban India per 1000 elderly males. 81% of the elderly in India (77.9 % in Urban and 82% in rural) are not covered by any scheme for health expenditure. This problem compounded with majority of elderly being economically dependent on their children, relative or others. 52 per cent of the aged in rural and 51% in urban were economically dependent on others. Needless to mention the economic status of the female is poor as compared to the male. About 90 per cent aged women in rural and 87 % in urban were economically dependent either partially or fully. Whereas 57% males in rural and 48% in urban were partially or fully economically dependent.

Health status of elderly

In the year 2014, 38 cases of hospitalization per 1000 population was reported whereas for the age group of 60 plus, hospitalization cases reported were almost three times at 110 cases per 1000.Hospitalization case for elderly was substantially lower at 99 per 1000 personin rural India than urban India where 133 cases per 1000 person were reported. This higher rate of hospitalization among urban elderly is expected due to most of the geriatric services available in urban areas.

Table 1 : Age-group wise cases of hospitalization reported per 1000 persons during the last 365 days

Age group	Rural			Urban			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
All	34	36	35	41	46	44	36	39	38
60 and above	106	93	99	142	125	133	117	103	110

Source: NSS report, 574

Highest proportion for hospitalization is recorded for 'Infection' (inclusive of all types of fever, jaundice, tuberculosis, tetanus, diarrheas/dysentery and other infection) followed by 'injuries' both in rural and urban area when persons of all the age groups are considered together. On the contrary, both in rural and urban area highest proportion of elderly hospitalization is recorded for cardiovascular disease (16% in rural and 20.6% in urban). Proportion of hospitalization for cardiovascular disease is more among the older elderly.

As expected private sector comprises major share of hospitalization cases both in Rural and Urban India. However, gap between Public and Private Hospitalization is narrower in case of Rural India than Urban India. It reflects, as expected, on the accessibility of rural population to the private hospital either due to non-availability of private hospitals or due to non-affordability of the rural elderly to access the services of private hospitals. However, rural urban breakup of hospitalization cases is by the residence of the concerned individual not by the actual place of hospitalization. Information was collected only on the state in which hospitalization took place in case where hospitalization is in a state different from state where the ailing elderly resides. Hence the extent of the lack of infrastructure and health services in rural areas could not be ascertained from NSS survey.

Table 2: Elderly hospitalization cases by level of care

Level of care	Rural	Urban
PHC	3.7	1.4
Public hospital	34.8	30.0
Private hospital	61.4	68.6
All	100	100

Table 3: Elderly hospitalization cases by type of ward

Type of ward	Rural	Urban
Free	39.8	30.9
Paying General	43.8	40.2
Paying special	16.4	28.9
All	100	100

As proportion of hospitalization cases in public hospital was more in rural area as compared to urban area so was the proportion of hospitalization cases with free type of ward at higher side in rural area than urban area. This also shows the lower level of affordability for the health care system by the rural elderly.

It has been observed that both in rural and urban areas, the percentage of households where at least one member was hospitalized increases as we move from lower to higher quintile class of monthly per capita consumption expenditure (MPCE).

Quintile class of UMPCE (Usual Monthly Per Capita Expenditure) refers to the 5 quintile classes of the distribution of households by MPCE and the quintile classes are referred to simply as I (lowest quintile class), 2, 3, 4 and 5.

Following table shows the lower and upper limits of the all-India quintiles.

Table 4: Lower and upper limits of UMPCE in different quintile classes for each sector.

Quintile class of MCPE	MCPE in Rs.			
	Rural		Urban	
	Lower limit	Upper limit	Lower limit	Upper limit
1	2	3	4	5
1	0	800	0	1182
2	800	1000	1182	1600
3	1000	1264	1600	2200
4	1264	1667	2200	3200
5	1667	-	3200	-

Table 5: Percentage of at least one hospitalization in various MPCE groups

MPCE classes	Rural		Urban	
	Male	Female	Male	Female
1	8	9	9	13
2	7	8	14	14
3	18	19	17	17
4	25	22	25	27
5	42	42	36	30
All	100	100	100	100

An analysis of morbidity prevalence patterns by age clearly indicates that the elderly experience a greater burden of chronic as well as short duration ailments compared to other age groups, across genders and residential locations. Morbidity prevalence reaches its peak at the age group 70 plus.

Table 6: Proportion (per 1000) of ailing persons during last 15 days for different age group separately for chronic and short duration ailment

Age-group	PAP (in 1000)					
	Rural			Urban		
	Chronic	Short duration	All	Chronic	Short duration	All
(1)	(2)	(3)	(4)	(5)	(6)	(7)
0-4	4	99	103	9	105	114
5-9	6	52	58	11	69	80
10-14	6	39	45	9	47	56
15-19	9	32	41	12	37	49
20-24	11	37	48	10	31	41
25-29	17	32	49	14	39	53
30-34	24	34	58	26	38	64
35-39	33	43	76	54	51	105
40-44	54	47	101	77	56	133
45-49	73	53	126	114	46	160
50-59	96	45	141	185	50	235
60-64	175	79	254	302	48	350
65-69	203	61	264	305	57	362
70+	235	71	306	320	53	373
60+	204	72	276	309	53	362
All	**40**	**49**	**89**	**67**	**51**	**118**

The elderly most frequently suffer from cardiovascular illness, circulatory diseases, and cancers and management of these chronic diseases is also very costly, especially for cancer treatment, joint replacements, heart surgery, neurosurgical procedures etc., thereby making it out of pocket for elderly persons. Elderly population suffers from multiple chronic diseases. This mixed disease burden among the Indian elderly places unique demands on the country's public healthcare system.

There is a feminization of the health status of elderly population. More women report poor health status as compared to males, and yet a far greater proportion of men are hospitalized as compared to females. Though the percentage of population reported ailment in rural is almost same for male and female, the fact that there are 1035 elderly female per 1000 elderly male in rural area clearly indicates that in absolute number, ailing female elderly outreaches ailing male elderly.

Table 7: Percentage of population reported ailment and hospitalization during the reference period

	Rural		Urban	
	Male	**Female**	**Male**	**Female**
% reported ailment	27.6	27.5	34.7	37.6
% reported hospitalization	7.3	7.1	10.0	9.5

Non affordability or financial constraint was reported to be the major reason for treatment without medical advice. In rural areas, as expected, the second most cited reason for not seeking medical advice is lack of access to medical facility.

Financial protection for health spending in India is largely in the form of savings and insurance. However, insurance in India is limited not only by its low coverage of conditions, but also by low coverage of populations.

Change in socio-economic status adversely affects the health care of elderly. Economic dependency increases due to loss of income due to retirement or unemployment at 60plus. Financial risk protection for health care in the form of Insurance coverage for elderly is very poor in India. The following table shows the extent of coverage of health expenditure support for the 60plus population.

Table 8: Percentage of persons covered under insurance for medical expenditure

	Rural			Urban			Rural +Urban		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Government	16.3	17.2	16.7	15.1	14.7	14.9	15.9	16.4	16.1
funded insurance									
scheme									
Employer	0.5	0.5	0.5	2.0	2.0	2.0	1.0	0.9	1.0
supported									
(other than got.)									
Arranged by	0.3	0.3	0.3	5.0	4.9	4.9	1.8	1.7	1.7
individual									
household from									
insurance company									
Others	0.1	0.0	0.1	0.3	0.3	0.3	0.2	0.1	0.1
not covered	82.8	82.0	82.4	77.7	78.1	77.9	81.2	80.8	81.0
All	100	100	100	100	100	100	100	100	100

It is thus seen that as high as 82.4% of rural 60plus population and 77.9% of urban 60plus population were still not covered under any scheme of health expenditure support. Government, however, was able to bring about 14.9%

urban and 16.7% rural 60plus population under health protection coverage through Rastriya Swasthya BimaYojana (RSBY) for unorganized workers and those below poverty line, ESI for organized workers,CGHS for government employees and other state levels insurance plans that cover the below poverty line population. Only 4.9% of urban 60plus population had some arrangement of medical insurance from private provider and for rural 60 plus population this share of private medical insurance is negligible at 0.3%.

Table 9: Percentage of elderly population insured

MPCE Class	Rural	Urban
1	17.6	18.3
2	18.7	15.0
3	18.1	19.3
4	19.8	20.3
5	23.3	28.0

Lack of employment and income affect elderly utilization of medical insurance, as these populations are often incapable of paying regular insurance premiums. Finally, insurance companies often explicitly exclude the elderly due to age limits or eligibility restrictions for those with pre-existing conditions. This results in heightening the estrangement of the aged from a healthcare system and policy environment that has historically lagged in supporting the financially weak.

In addition to the economic constraint, a key physical barrier to access health care system is that many elderly require home-based care, a need arising from illness-related confinement following an age gradient. Sample survey data suggest that as many as 84 per 1,000 population in rural areas and 70 per 1,000 population in urban areas are confined to the home meaning that in absolute terms, the need for elderly care is slightly higher in rural areas. Reduced mobility due to illness related confinement hinders health-seeking.

Table 10: Percentage of aged persons unable to move outside and confined to bed or home

Age-group	% of immobile aged persons					
	Rural			Urban		
	Male	Female	Persons	Male	Female	Persons
(1)	(2)	(3)	(4)	(5)	(6)	(7)
60-64	1.5	3.0	2.3	2.2	4.4	3.2
65-69	2.6	7.0	4.7	3.3	5.6	4.5
70-74	10.9	13.6	12.4	5.3	11.4	8.2
75-79	9.4	17.3	12.8	8.1	11.6	9.7
80+	30.0	37.4	34.0	19.9	31.9	26.7
All	**6.5**	**10.2**	**8.4**	**4.9**	**9.1**	**7.0**

Ref : NSS report, 574

It is found from the above discussion that the elderly population does not have access to health care system commensurate to their health conditions and even where the care is physically accessible, costs of accessing this care hinder uptake (affordability).

Materials and Method: In the next section of the paper Binary logistic regression model is fitted to find out the significant predictor variables which describe the challenges in the domains of access and affordability in the health care system. Logistic regression is normally recommended when the independent variables do not satisfy the multivariate normality assumption and at the same time the response variable is qualitative. Situations where the response variable is qualitative and independent variables are mixture of categorical and continuous variables, are quite common and occur extensively in statistical applications in agriculture, medical science etc. The statistical model preferred for the analysis of such binary (dichotomous) responses is the binary logistic regression model, developed primarily by a researcher named Cox during the late 1950s.

From the previous section it is clear that age and gender are two important variables. In addition, education, social status (whether belongs to scheduled tribes or castes), residence (rural/urban), are important factors that may affect the ability to control illness. Economic status of the household in which the individual lives will again affect health directly as well as indirectly via the ability to seek care and treatment. Hence monthly per capita expenditure (as a proxy to income of the household), insurance coverage and economic dependency are also used as predictor variable in the model. Physical mobility and living arrangements are also seems to be the probable factor deciding the extent of access and affordability of the health care system. The details of the predictor variable, dummy variables corresponding to predictor variable, indicator variable and reference variable are given at annexure-I.

3. RESULTS AND DISCUSSION

The result of the binomial regression model to ascertain the effect of various predictor variables is given below.

Table 11 : Effect of various predictor variables on hospitalization of elderly persons

Variable	Coefficient (SE)	Odds ratio
sector(1)	-.239 (0.031) **	0.787
sex(1)	.331 (0.034) **	1.393
flg_age(1)	-.174 (0.036) **	0.84
flg_age(2)	-.276 (0.044) **	0.759
flg_age(3)	-.310 (0.044)**	0.733
flg_age(4)	-.101 (0.0.63)	0.904
flg_sg(1)	-.190 (0.063) **	0.827
flg_sg(2)	-.175 (0.054) **	0.84
flg_edu(1)	.047 (0.039)	1.048
flg_edu(2)	.179 (0.064) **	1.196
flg_ins(1)	.180 (0.036) **	1.198
flg_mpce(1)	-.288 (0.035) **	0.75
flg_mpce(2)	-.577 (0.040) **	0.562
eco_depend(1)	-.115 (0.044) **	0.892
eco_depend(2)	-.103 (0.039)**	0.902
flg_live(1)	1.153 (0.09) **	3.167
flg_live(2)	1.166 (0.089) **	3.208
flg_mobil(1)	1.077 (0.044) **	2.936
Constant	-.627(0.118) **	0.534

*** Significant at 99% confidence level*

The result mentioned above showed that almost all the variables are statistically significant with signs in the expected direction. The odds in favor of urban area for hospitalization are 0.787. However, from the estimated figure of NSS 71st data, it is found that more number of hospitalization cases is reported in urban area. As already discussed that in NSS, the reporting of hospitalization in urban or rural area were based on the domicile of the respondent not on the basis of actual location of hospitalization. Higher figure for hospitalization cases in urban area may be due to better accessibility and affordability of the urban population for health services as compared to rural area.

Hospitalization among the female population is expected to be 1.39 times higher as compared to the male population. This also indicates towards the feminization of health status as NSS data shows less number of hospitalization cases reported among the female population. The probability of hospitalization increases as we

move from lower educated population to higher educated population. The elderly who are not covered under any form of health insurance scheme are 1.198 times more likely to be hospitalized than the elderly who are covered under any health insurance scheme. The elderly who are fully economically dependent are 0.902 times less likely to be hospitalized than the elderly who are economically independent. It can easily be seen the elderly who are staying with their spouses are 3.20 times more likely to be hospitalized than the elderly who is living alone. As already discussed physical mobility of the elderly hinders the access to health care services, the results of the logistic regression also shows that the elderly who are physically mobile are 2.936 times more likely to be hospitalized than who are confined to bed/home due to illness.

Similar kind of results is also observed for the chronic illness, the details of which are given in the table below. However, for chronic ailment the difference between male and female is not much significant. :

Table 12: Effect of various predictor variables on chronic ailment

Variables in the equation	B	S.E.	Sig.	Exp(B)
sector(1)	-.469	.031	.000	.626
sex(1)	.080	.034	.019	1.083
flg_age			.000	
flg_age(1)	-.172	.037	.000	.842
flg_age(2)	-.320	.044	.000	.726
flg_age(3)	-.244	.056	.000	.784
flg_age(4)	-.138	.063	.029	.871
flg_sg			.000	
flg_sg(1)	-.724	.073	.000	.485
flg_sg(2)	-.824	.064	.000	.439
flg_edu			.000	
flg_edu(1)	.042	.039	.290	1.043
flg_edu(2)	.278	.063	.000	1.321
flg_ins(1)	.683	.035	.000	1.981
flg_mpce			.000	
flg_mpce(1)	-.388	.035	.000	.678
flg_mpce(2)	-.850	.040	.000	.427
eco_depend			.000	
eco_depend(1)	-.020	.045	.653	.980
eco_depend(2)	-.182	.040	.000	.834
flg_live			.021	
flg_live(1)	.238	.096	.013	1.268
flg_live(2)	.262	.095	.006	1.299
flg_mobil(1)	.558	.046	.000	1.747
Constant	1.270	.128	.000	3.560

4. CONCLUSION

The population of India will become older over the years and will bring with it enormous burden of morbidity and mortality. The major hindrance towards availing health care services by the elderly seems to be economic dependency, living arrangements, physical mobility and lack of institutional financial protection for paying for

health care. Providing better health care system in rural India is a challenge for the Government. The stringent rules for eligibility of health insurance need to be made more flexible to cover larger proportion of geriatric population. More and more qualitative data and research is needed to find in depth the various aspects of poor health of the elderly.

5. LIMITATION

Though information was collected on one's own perception regarding change in state of health, in absence of information on what type of services the elderly require improving their state of health it is difficult to estimate the quantum of various service provider required to ensure the well being of the elderly.

Measuring health status of elderly only from self reported data has some drawback particularly country like India which is characterized by widespread undiagnosed diseases, including hypertension and diabetes, and low awareness of health problems. However, it is important to mention here the findings of the study by Gupta and Shankar (2003), which shows that the elderly are better able to report their physical discomforts that may not require diagnosis and May not often prompt treatment-seeking behavior.

Interstate variations in the number and severity of predictor variables for affordability and accessibility are out of purview of this paper.

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Annexure-I

Predictor/independent variable and their value	**Dummy variable and their value**	**Indicator variable and their value**	**Reference variable and their value**
Sector : Rural (1) , Urban (2)	No dummy used	Sector(1): Urban (2)	Rural(1)
Sex: Male (1), Female (2)	No dummy used	Sex(1) : Female(2)	Male(1)
Age	Flg_age: 60-65 years (1), 65-70 years (2), 70-75 years (3), 75-80 years (4), 80 years and more (5),	Flg_age(1): 65-70 (2)Flg_age(2): 70-75 (3)FLg_age(3): 75-80 (4) Flg_age (4): >80(5)	age: 60-65 years (1)
education	Flg_edu : upto Primary (1), Middle to higher secondary (2), graduate and above (3)	Flg_edu(1) : Middle to higher secondary-2 Flg_edu(2): graduate and above -3	up to primary (1)
Insurance coverage	Flg_insurance : Insured(1), not insured (2)	Flg_ins(1) : not insured -2	Insured(1)
Economic condition: independent (1), partially dependent (2), fully dependent (3)	No dummy used	Eco(1): partially dependent -2 Eco(2): fully dependent -3	Economically independent(1)
Living arrangements	Flg_live: living alone (1), Living without spouse (2), Living with spouse (3)	Flg_live(1): living without spouse –2 Flg_2: living with spouse -3	living alone (1)
Physical Mobility:	Flg_mobil: physically immobile (1); physically mobile – (2)	Flg_mobil (1): physically mobile - 2	physically immobile (1)
Social group:	Flg_SG: Scheduled Tribes-1, Scheduled Castes -2, Other -3	Flg_SG(1):, Scheduled Castes -2 Flg_SG (2): Other -3	ST (1)
Monthly per capita consumption expenditure	Flg_mpce: Lower income (1), middle income (2), higher income(3)	Flg_mpce (1): middle income (2) Flg_mpce(2): higher income(3)	Lower income (1)