Gender Differentials in Economic Security & Functional Health Status among Elderly in India

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1. Introduction

Improving life expectancy, both at birth and in later ages, and dwindling fertility rates have contributed to rapid aging of the Indian population. People aged 60 and above will comprise 20% of the Indian population by 2060 (World Health Organization, 2015). The ageing of population is coupled with its feminisation- rise in the proportion of women among the elderly. Due to higher life expectancy of women, women marrying older men or remarriage among widowed men, absolute number of elderly women is higher than older men (Rajan, 2001; United Nations, 2013; UNDESA, 2011; Balagopal, 2009). Tied to these demographic changes is a process of rapid urbanization and changing living arrangements wherein the institution of joint families is withering away. The role of women of the household, hitherto seen as the primary caregivers is also changing. In the scenario of weakening traditional family support systems, provision of economic and social security for healthy ageing is critical. Elderly generally suffer from poor health as they grow old and thus accrue relatively high health care costs. Older women are particularly vulnerable to unmet need for healthcare (Panapasa, 2002), and the social predisposition against them puts them in a disadvantageous position (Prakash, 1999). There is thus a need to scrutinize health or economic security issues pertaining to the elderly, notably women.

With respect to the health conditions of the elderly, there is high prevalence of chronic conditions (NCDs) among this age group. Some of these chronic conditions are known to bring about restrictions in activities of daily living(ADLs) or functional limitations (Woo, 1998; Boult, 1994). These restrictions involve inability or difficulty on part of the elderly to perform certain basic activities of daily living such as walking, brushing, bathing etc. without dependence on others. The existence of physical disability lowers the quality of life that is available to the elderly, while also reducing their morale. There is an association between physical disability and depression even after controlling for various socio-economic factors. (Ganguly 1999; Barberger-Gateau, 1992; Beekman & Prince, 1999; Forsell et al., 1994). Poor functional health status is also a predictor of mortality (Scott, 1997). Elderly suffering from ADL disabilities come to be dependent on their families for caregiving, or in severe cases, the need for long term care or rehabilitation services. Assistive devices can also help with the transition, but these come at a cost.

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With the collapse of the traditional family structure, and rising costs of long term institutional care, the presence of these functional limitations present a considerable financial burden for elderlyhouseholds. Majority of the elderly remain economically inactive and do not possess sufficient economic resources to support their health costs. The out-of-pocket health expenditure is sizeable for elderly households, especially elderly widows, who often lack financial security.

Thus, the provision of economic and social security for healthy aging is critical (Arokiasamy et. al., 2012; Kumar, 2003; Kulkarni, Raju and Bammidi, 2014). In the long run, this would call for enhancing health infrastructure and its affordability for the elderly, particularly by setting up long term care facilities.In the interim it is imperative to make the lives of the elderly as comfortable as possible, with a special focus on the vulnerable sections. In this paper, we examine the economic and health condition of the Indian elderly, particularly women. We further test for a gender-stratified linkage between economic and health conditions and prevalence of disabilities in activities of daily living (ADLs), and identify any other risk factors for the existence of functional limitations.

2.Economic Security in Old Age

The informal sector accounts for nearly 90 % of India's labour force andis instrumental for the absence of income security at old age. Income adequacy at retirement is accomplished either by inter-generational transfers or voluntary savings. The focus on financial inclusion is recent and leaves much to be desired. The passage of the Unorganized Workers Social Security Act (2008) has led to the proliferation of several welfare schemes, However, the benefits from these will accrue to later birth cohorts.

The lack of pensions or other welfare schemes has necessitated elderly to continue working after reaching the "retirement" age- nearly 40% of the elderly population continues to work after age 60 (MoSPI, 2011). Rural elderly, particularly those engaged in agriculture are more inclined to continue work. 66% of the elderly rural males and 23% of the elderly rural females continued to work (MoSPI, 2011). Elderly workforce, comprised mostly of those belonging to poorer socio-economic strata, is concentrated in the informal sector or in low-skilled or unskilled occupations. (Reddy, 2016). The provision of pension could reduce employment in males belonging to the 55-70 age group with primary or lower level of education but has not shown to carry the same impact on women. (Kaushal, 2014).

Women face a double disadvantage because of traditional gender roles, and greater life expectancy. Child-rearing and other domestic activities weigh heavily on a woman's schedule, thus contributing to lower labor force participation and years of employment. Often, women find employment in the informal sector. Thus, savings from income for women tend to be abysmal. Further, inheritance laws limit the prospect of asset-based income for women. This has led to high economic dependence among elderly women: Only 14% (17%) of women are economically independent in rural (urban) areas, as opposed to 50% of the males (MoSPI, 2011). In recent years, there has been greater emphasis towards increased education and labor force participation

of women.The older cohort of women (currently aged 60 or older) are unlikely to have benefitted from it.

While the lack of savings isnot a new phenomenon, fraying family ties and increasing longevity complicate the problem. Traditionally, families are seen to be providing an essential role in the care of elderly by means of income transfers and emotional support. The breakdown of the family may be attributed to several causes. Reduction in land holding size and lack of rural employment contribute to migration of workers towards urban or industrialized rural areas. Increased participation of women in the workforce has diminished their care-giving capacity to ageing parents. Further, expenses associated with the elderly are rising because of increased longevity that brings with it increased health spending.

The economic landscape of the elderly is thus plagued by many problems. Unavailability of formal pensions and the lack of financial literacy hinders prudent retirement planning. This, combined with inadequate public transfers has contributed to high asset-based consumption and reliance on familial support (Ladusingh, 2013). Even with the provision of pension, much of it is spent on medical or education expenses. (Kaushal, 2014). There is a need to provide geriatric care focused on the health care needs of the elderly to address some of these issues.

3. Health Status of the Elderly in India

There is enormous burden of morbidity in old age, and it is tilted towards non-communicable diseases (NCDs) such as diabetes, hypertension, coronary heart disease, osteo-arthritis, stroke, dementia, osteoporosis, cancer, enlarged prostate, depression, and cataract-related blindness. Among the oldest old, complications relating to general physical weakness exist- asthma, poor eyesight, cold and cough, joint pains.

Ailment and hospitalization rates in this population are higher than other populations. NSS (2014) reports that 25% of persons aged 60-69 years in rural areas are ailing, while in urban areas the figure is 35%. Among older age groups, the proportion is higher. The prevalence of multi-morbidity is as high as 30.6% among those aged 70 years or above. (Pati, 2014).

Among the elderly, the burden of diseases is disproportionately higher for women. They are more likely to report poor health (Singh, 2013). There is greater likelihood of women's diseases being long-term and chronic (Borooah, 2016). Older females are also more likely to experience poor health owing to a traditional focus on home care. (Johnson, 2011; Borooah, 2016). Elderly women are more disadvantaged and underprivileged because of being old, poor and women (Prakash, 1999). Further, women are less likely to seek care (Gupta, 2003; Panapasa, 2002). Expenses on treatment for females, particularly older females, are also likely to be lower (Batra, 2014; Borooah, 2016). The wellbeing of financially dependent women thus lies in jeopardy.

Besides gender, several socio-economic factors are known to play a part in the health status of individuals- age, education attainment, consumption expenditure. Low income and low

education are associated with poor health (Gupta, 2003). The chances of care seeking increase with an increase in wealth. (Gupta et al, 2003).

Higher incidence of disease is accompanied by higher costs of treatment. The health care sector in India is plagued by low share of health expenditure in the GDP, and high out-of-pocket expenditure. There is proliferation of unregulated private health institutions. The National Health Mission sought to improve health delivery system, but its focus has been on maternal and child health services. Primary & secondary care has not improved much. The Rashtriya Swasthya Bima Yojana (RSBY) is another scheme aimed at reducing the high out-of-pocket expenditure of healthcare in India. RSBY provides health insurance coverage to several BPL households and unorganized sector workers. The coverage of RSBY does not extend to primary, outpatient or high-level tertiary care (Marten, 2014). Awareness about these schemes also remains low.

4. Gender, Economic Security &Functional Limitations

The burden of chronic diseases is intensified by the presence of disabilities in old age. 6.4% of elderly in rural areas and 5.5 % in urban areas experience one or more disabilities (NSS, 2011). Factors such as senescence, frailty and lower body strength are thought to bring about some decline in functional health status (Alam, 2016). Often, certain preventable causes such as injuries or sensory impairments may contribute to functional limitations among the elderly (Alam, 2011). While declining muscle strength is inevitable in old age, certain sections are particularly vulnerable. Previous studies have found that factors like age, sex, education, income and occupation and chronic diseases are associated with functional status (Rautio et. al., 2005; Koukouli, Vlachonikolis and Philalithis, 2002; Santos et. al., 2008; Rodrigues et. al., 2009; Holmes 2009; Honjo, 2009).

Socioeconomic and demographic factors are found to have an impact on functional ability (Bedoun, 2005). Studies conducted to assess the factors responsible for functional disabilities include age, gender and education. An increase in age increases the risk of functional limitations (Holmes, 2009). Females are more likely to experience functional limitations (Barbosa et al., 2005; Smith, 1997; Kastor, 2016; Nagarkar, 2017; Alam, 2011), while education reduces the risk of functional limitations. (Holmes, 2009; Arokiasamy, 2015; Kastor, 2016). Women are also progressively experiencing greater disability by increase in age (Holmes, 2009) or birth cohort (Sjölund, 2014). There is also greater likelihood of experiencing 3 or more disabilities among women than in men. Further, women may also lack assistance in coping with these limitations. (Alam, 2011). Education may play a part owing to psychosocial or behavioral issues (Honjo, 2009). There are linkages between education and income as well.

Area of residence (rural or urban) is also influential. Co-residence (as opposed to living alone or with a spouse) is tied to the likelihood of disability (Bedoun, 2005). Social identity also plays a part in determining the existence of functional limitations. Historically disadvantaged groups tend to experience a greater likelihood of disability. (House, 1990; Holmes, 2009).

Existing or past health conditions also have an impact. Poor health increases dependence in activities of daily living (Cramm, 2015). Hospitalisation in the previous year (Shinkai 2003), presence of chronic diseases (Arokiasamy, 2015; Kastor, 2016; Nagarkar, 2017) and tobacco usage increase the chances of functional limitations. Certain chronic conditions have a greater association with functional limitations viz. asthma, COAD, hypertension, osteoarthritis, gastrointestinal tract diseases, anemia, neurological problems, visual impairment, hearing impairment, depressive symptoms, and others including urinary incontinence, fecal incontinence (Joshi et al, 2003). The association with self-rated health has not been conclusively established in either study for India. Sharma et al. (2014) finds the presence of musculoskeletal problems and cataract significantly affect the risk of functional status decline among the elderly in Shimla hills of North India.

High incidence of chronic & multiple diseases coexists with higher risk of functional dependency (Arokiasamy, 2010). The presence of functional limitations is a predictor of progressively rising healthcare costs (Mor et al, 1994), morbidity and short-term mortality (Alam, 2011; Stineman, 2012). Low quality of care in public health has increased the reliance on market solutions- in this case private health care institutions. Considering rising poverty among the elderly, lack of formal long-term care facilities coupled with the changing family structure spells doom for India's elderly population.

There is a lack of consensus for the direction of the linkage between economic status and functional status. In these numerous studies, economic status has variedly been defined in terms of income, consumption or wealth. Bedoun (2005) finds that an increase in income is associated with lower limitations. Smith (1997) cautions that the use of income in such an analysis should consider its sources and finds that while income from earnings has a positive correlation with health, income from welfare has a negative correlation. Using a marginal per capita expenditure definition of poverty, Pandey (2009) finds that poverty is higher among the disabled elderly, though this relationship is stratified by several socio-demographic variables such as gender, residence location, social groups and educational status. The use of a wealth-based definition of economic status has gained prominence in recent times, because of the absence of a reporting bias. Zimmer (2008) and Smith (1997) suggest the lack of a linear relationship between wealth and the odds of functional limitations. In the context of India, no clear answers emerge. Using the LASI survey data for Punjab, Rajasthan, Kerala and Karnataka, Arokiasamy (2015) failed to find a clear relationship between wealth quintile and functional disability, whileKastor (2016) finds that an increase in wealth is associated with an increase in number of limitations.

Previous studies pertaining to India examining the correlates of functional limitations are restricted to only select states, and hence their replicability for the rest of the country is questionable. There is also a lack of consensus regarding the linkage between wealth and the functional health status of older adults in India. Through this study, we aim to explore the nexus between gender-stratified economic security and ADL disabilities in India. The study will

contribute to a larger literature on the gender-stratified economic conditions of the Indian elderly, while also drawing up its link with health conditions.

5. Method

5.1 Data

The studyutilized the second round of the India Human Development Survey (IHDS), 2012 which is a national household level survey collecting information on various aspects relating to households- income and social capital, education and health and gender relations, to name a few. The survey was jointly organized by researchers from the University of Maryland and the National Council of Applied Economic Research (NCAER), New Delhi.

Certain variables used in this study were constructed keeping in mind the goals of this study. The definitions of these are present below:

5.2 Measures of Socio-Demographic Characteristics

For the purposes of this paper, as in the National Policy on Older Persons, 1999, elderly have been defined as those aged 60 years or above. In our analysis, we use three age groups:60 to 70 years of age, 70 to 80 years of age or aged 80 years or above.

Marital status is defined as married, widowed or others. The category "others" includes those who are unmarried, separated or divorced or those who are married but gauna has not been done.

Educational status of the individual is categorized as illiterate, having primary or lower level of education, secondary or lower level of education or those had completed graduation or higher levels of studies.

5.3 Measures of Health

We define the presence of functional limitations as having difficulty in, or inability to perform at least one of the following activities of daily living (ADL): walking 1 km, seeing distant things (with glasses, if any), seeing near objects, such as reading/ sewing (with glasses, if any), going to toilet without help, dressing without help, hearing normal conversation or speaking normally.

Data on ailments of the short-term - fever, cough or diarrhea- if occurring 30 days prior to reporting is present in the data. IHDS identifies several long-term diseases such as Cataract, Tuberculosis (TB), High Blood Pressure, Heart disease, Diabetes, Leprosy, Cancer, Asthma, Polio, Accident in the last 12 months, Other Long-Term Diseases, Paralysis, Epilepsy, Mental illness or STD/AIDS. An individual ailing from two or more long-term diseases was identified as experiencing multi-morbidity.

5.4 Measures of Economic Well-being

The economic status of the elderly is assessed by examining various parameters- wealth, primary activity, income from pensions & property and coverage via various social protection schemes through the lens of age, gender & habitation status.

The use of wealth as an indicator of economic wellbeing is necessitated by the problems of recall bias or seasonality that plague consumption or income estimates. Often, as in our case, data on income is missing for considerable observations. To remedy this, the use of asset-based indicators has gained prominence. (Gwatkin, 2007; Filmer & Pritchet, 2001). An asset-based evaluation of wealth draws from long-term lifetime income, and may be a better predictor of health, which is a stock.

However, the treatment of assets to create a wealth index has varied. Previous studies have attempted to either assign equal weights to all assets or price-determined weights in the construction of such an index. However, in assigning equal weights to all assets, there may be a tendency to underweighting or overweighing certain assets. The use of data reduction methods such as Principal Component Analysis is better because it allows a higher weight to be accorded to luxury goods (the ones exhibiting inequality in possession across groups). However, in the presence of categorical data, it is better to work with multiple correspondence analysis because it imposes fewer restrictions on the data. (Booyson, 2005; Traissac, 2012). Further this approach is also in line with several welfare axioms (Ezzrari, 2013). The present paper has relied on a linear indicator using weights from multiple correspondence analysis, as the data on 23 different assets was categorical in nature. The first dimension was used to create a wealth index, which helped to divide households into 3 wealth terciles. The internal coherence of the wealth index was assessed using the distribution of assets across various wealth quintiles (Table A1 in the appendix).

The approach is not without errors. While an asset-based index may be indicative of future income, it is not a good proxy of current household wealth. Further, by creating a common relational index for the entire country, we are not allowing sufficient room for certain contextual specifications (such as the differences between states or rural urban areas).

5.5 Statistical Analysis
To assess the health status and economic security of the elderly, gender-stratified descriptive statistics & chi-square test were employed. We examine economic security by wealth terciles, income from (government or private) pensions or property, and their present activity status. Morbidity patterns are assessed by looking at the incidence of or treatment sought for short-term or long-term diseases.

The relationship of functional health status of the elderly with their gender and wealth is addressed via a multivariate logit model.The model adjusts for various covariates- education status, multi-morbidity, residence and marital status.

6. Results
The details of variables used, and their frequencies are reported in Table 1 below.

Table 1: Characteristics of the Selected Population

		Percent
Age Group	**60-70 years**	60.02
	70-80 years	28.64
	80 years +	11.34
Sector	**Rural**	67.41
	Urban	32.59
Region	**Central**	19.05
	East	15.87
	North	22.48
	North East	3.15
	South	25.16
	West	14.30
Living Arrangement	**Living with Others**	96.68
	Living Alone	3.32
Gender	**Male**	47.97
	Female	52.03
Marital Status	**Married**	60.98
	Widowed	36.65
	Others	2.37
Education Level	**Illiterate**	57.04
	Primary Education	17.87
	Higher secondary	20.92
	Graduate or above	4.17
Multi-morbidity	**No Diseases**	67.42
	One chronic Disease	22.52
	Two or more Chronic Diseases	10.06
Wealth	**Low**	31.92
	Medium	31.35
	High	36.73

6.2 Economic Security of the Elderly

The details of wealth and income sources of the elderly are present in table 2 and 3. Table 2 shows the distribution of the population by various wealth terciles. In general, elderly living alone have lower chances of belonging to the higher wealth terciles. Relatively "younger" elderly (those aged between 60-80 years) living with others tend to be spread out across the different wealth terciles. However, among the elderly aged 80 years or above co-residing with others there is a higher chance of belonging to higher wealth terciles.

Table 2: Distribution of elderly population by wealth terciles

Age	Gender	Living Arrangement	Wealth Terciles			
			Low	Middle	High	
60-70 years	Female	Living Alone	78.85	13.78	7.37	100
		Others	31.78	32.24	35.98	100
	Male	Living Alone	77.78	16.67	5.56	100
		Others	29.24	31.72	39.03	100
70-80 years	Female	Living Alone	81.63	13.78	4.59	100
		Others	28.79	33.25	37.96	100
	Male	Living Alone	81.48	9.26	9.26	100
		Others	30.71	32.01	37.28	100
80 years +	Female	Living Alone	87.23	8.51	4.26	100
		Others	26.61	30.43	42.97	100
	Male	Living Alone	79.17	8.33	12.5	100
		Others	29.02	30.77	40.21	100

Presently, "income" sources of the elderly drive from pensions (either private or social), family transfers and asset-based consumption. In the IHDS-II dataset, information on income transfers is not available. The details of private & social pensions and asset-based consumption (property) are present in Table 3. Despite their predominance in lower wealth terciles, elderly living alone have very poor coverage under various pension schemes. Less than 10% of the elderly in either age-gender-living arrangement derive income from property. Coverage from government pensions is slightly more promising, but the figures remain abysmally low. Private pensions present a bleaker picture, with coverage not exceeding 2% of population, except for elderly males aged 80 years or above living alone.

Table 3: Proportion of elderly having access to income from pensions or property

Age Group	Gender	Living Arrangement	Income Source		
			Income from Property	Pension from Government	Pension from Private Work
60-70 years	Female	Living Alone	4.81	10.3	1.3
		Others	3.98	14.9	1.2
	Male	Living Alone	5.56	16.7	0
		Others	3.82	15.8	1.9
70-80 years	Female	Living Alone	6.63	9.7	0
		Others	4.45	12.7	0.8
	Male	Living Alone	5.56	7.4	0
		Others	4.32	18.1	1.2
80 years +	Female	Living Alone	8.51	14.9	0
		Others	3.75	11.9	0.6
	Male	Living Alone	4.17	16.7	4.2
		Others	3.85	15.5	0.3

The coverage of BPL households under the Old Age Pension Schemes is shown in table 4.Less than 25% of BPL households are covered under the Indira Gandhi National Old Age Pension Scheme (IGNOAPS). Elderly men aged between 70-80 years living alone experience the highest coverage in their age-gender-living arrangement intersection, while co-residing women aged between 70-80 years' experience the lowest coverage.

The coverage of Annapurna Scheme (intended for BPL households eligible for IGNOAPS) is much lower.Here also the highest coverage is with men aged 70-80 years living alone. Several intersectional groups experience zero coverage.

Table 4: Coverage of elderly population (BPL) by government social security schemes

Age Group	Gender	Living Arrangement	Government Social Security Scheme	
			Indira Gandhi Old Age Pension Scheme	Annapurna Scheme
60-70 years	Female	Living Alone	16.67	0.64
		Others	8.44	0.08
	Male	Living Alone	11.11	0.00
		Others	8.02	0.10
70-80 years	Female	Living Alone	17.35	0.00
		Others	9.75	0.07
	Male	Living Alone	24.07	1.85
		Others	15.07	0.03
80 years +	Female	Living Alone	21.28	0.00
		Others	9.94	0.00
	Male	Living Alone	8.33	0.00
		Others	15.38	0.17

Figure 1 shows the percentage of elderly in various age groups who do not identify themselves as retired, indulged in household work, unfit or unemployed. 42% of the elderly aged 60-70 years and 20% of the elderly aged 80 years and above continue to work. 80% of elderly males aged 60-70 years living alone are engaged in work.

**Figure 1: Percentage of elderly engaged in paid work**
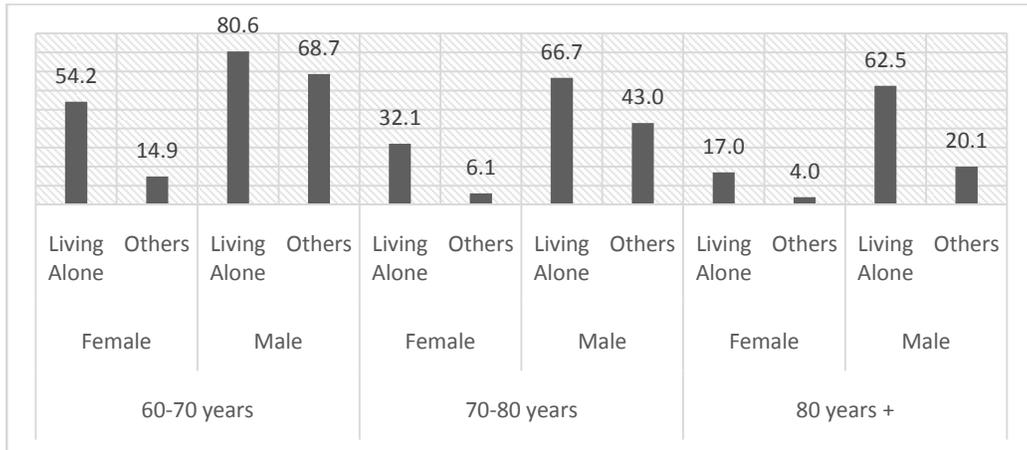
6.3 Patterns of Morbidity

An examination of the morbidity profile (Table 5) among the elderly reveals high prevalence of long-term illness.One-third of this population suffers from long-term illnesses. Short term illness (fever/cough/diarrhea) was most reported for females aged between 60-70 years, and males in the same age group reported the lowest incidence. In case of short-term illness, almost all cases were treated or advised. The gap between incidence of a short-term illness and its treatment is highest in the case of males aged 70 & above. The proportion of those who sought treatment for their long-term illness is one percentage point lower than the incidence values. This may be attributed to higher cost involved in the treatment of long-term illnesses. 55% of those not seeking treatment have non-APL ration cards.

Table 5: Health Status of the elderly

	60-70 years		70-80 years		80 years +	
	Female	**Male**	**Female**	**Male**	**Female**	**Male**
Whether Reported any Short-Term Illness	21.78	14.60	18.70	18.60	16.90	18.15
Whether Reported any Long-Term Illness	32.82	29.16	34.92	34.20	32.25	38.70
Whether Treated or advised for any Short-Term Illness	21.20	14.19	18.12	17.77	16.31	17.29
Whether Treated or advised for any Long-Term Illness	31.99	28.43	33.37	33.70	31.07	37.24

Figure 2: Prevalence of multi-morbidity among the elderly
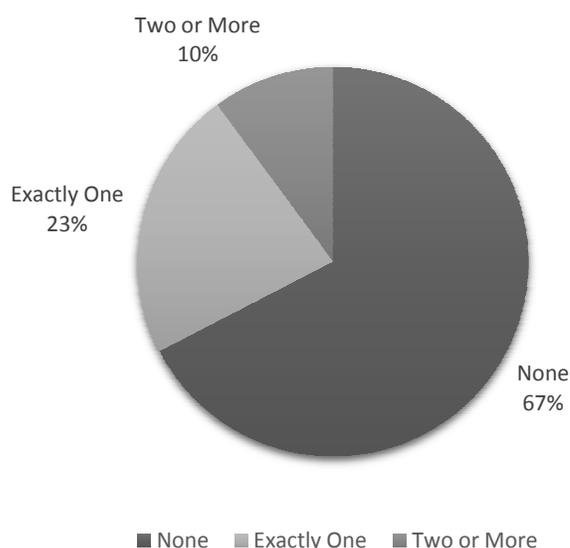
There is high prevalence of chronic diseases in this age group: 32% of the elderly suffer from at least one chronic disease (Table 6). The incidence of these chronic diseases across age and gender are reported in Table 7. Among the long-term diseases that plague this population, high blood pressure afflicts the most people across all demographic groups. Other diseases that are common include asthma, diabetes, cataract and other long-term diseases. Diabetes (cataract) is the third most common long-term disease among the 60-70-year olds (70 years and above).

Table 6: Disease profile of the elderly, by age & gender

	60-70 years		70- 80 years		80 years and above	
	Female	**Male**	**Female**	**Male**	**Female**	**Male**
Cataract	5.46	3.60	7.15	5.74	8.71	8.05
Tuberculosis	0.55	1.00	0.55	0.87	0.52	0.94
High Blood Pressure	14.01	9.82	14.63	12.26	13.36	12.16
Heart Disease	2.63	3.14	3.02	3.57	2.51	4.45
Diabetes	7.39	7.57	6.81	8.05	5.46	6.25
Leprosy	0.14	0.13	0.12	0.30	0.07	0.17
Cancer	0.18	0.21	0.34	0.23	0.22	0.43
Asthma	3.22	4.38	4.67	5.54	4.94	6.68
Polio	0.03	0.10	0.03	0.13	0.00	0.00
Paralysis	1.65	1.49	2.51	2.57	3.76	3.34
Epilepsy	0.49	0.28	0.64	0.33	0.37	0.34
Mental Illness	0.55	0.44	0.61	0.17	0.59	0.51
STD or AIDs	0.08	0.05	0.00	0.00	0.00	0.00
Accident	0.60	0.87	0.34	0.80	0.89	0.68
Other Long-Term Diseases	9.74	7.31	9.17	8.72	8.34	10.45

6.4 Functional Health Status of the Elderly

Roughly 30% of the individuals reported difficulty in, or inability to perform at least one of the activities of daily living.7% of the study group were unable to walk 1 km.

Table 7: Details of Functional Limitations among the elderly

Activity of Daily Living	Level of Competence		
	No Difficulty	Can do it with difficulty	Unable to do it
Walking 1 km	77.8	14.58	7.62
Going to toilet without help	91.31	5.89	2.8
Dressing without help	93.93	3.7	2.38
Speaking normally	90.09	8.09	1.82
Hearing normal conversation	94.91	3.83	1.26
Seeing distant things [with glasses, if any]	81.7	14.88	3.42
Seeing nearby objects [with glasses, if any]	84.31	12.64	3.05

The following tables show the percentage distribution of presence of functional limitations in various social, demographic, economic or health variables. There is a positive gradient of age with functional limitations. 33% of females, as opposed to 26% of males experience functional limitations. The incidence is higher in elderly who are widowed, illiterate or belong to the Southern region.

Table 8: Prevalence of functional limitations across several social, demographic & regional groups

		Presence of Functional Limitations	
		No	Yes
Age Group	60- 70 years	77.5	22.5
	70-80 years	63.9	36.1
	80 years +	48.5	51.5
Marital Status	Married	74.9	25.1
	Widowed	62.5	37.5
	Others	67.9	32.1
Sex	Male	73.9	26.1
	Female	66.6	33.4
Education	Illiterate	67.8	32.2
	Primary Education	69.7	30.3
	Higher secondary	75.2	24.8
	Graduate or above	79.3	20.7
Region	Central	64.1	35.9
	East	78.1	21.9
	North	71.5	28.5
	North-East	93.6	6.4

	South	62.6	37.4
	West	75.0	25.0
Religion	Hindu	69.9	30.1
	Muslim	72.2	27.8
	Others	70.21	29.79

The presence of chronic diseases greatly increases the chances of functional limitations. 55% of the elderly afflicted by two or more chronic diseases have ADL limitations, as opposed to 22% of the elderly having no chronic diseases.

Table 9: Prevalence of functional limitations by health status

		Functional Limitations	
		No	Yes
	No diseases	77.8	22.2
Multi-morbidity	**One Chronic Disease**	58.4	41.6
	Two or More Chronic Diseases	44.7	55.3

A movement from low to high wealth terciles greatly reduces the proportion of elderly suffering from functional limitations (33% in the low wealth tercile, as opposed to 28% in the high wealth tercile). The availability of pensions is associated with higher incidence of limitations. 34% of the elderly receiving pensions suffer from functional limitations, while 28% of those not receiving pensions experience limitations.

Table 10: Prevalence of functional limitations by wealth and income transfers

		Functional Limitations	
		No	**Yes**
	Low	67.1	32.9
Wealth Quantile	**Medium**	71.2	28.8
	High	71.8	28.2
Availability of Pension	**No**	71.3	28.7
	Yes	65.1	34.9

6.4.1 Results
The results from the logit model are present in table 11 below.

We find that age has a strong, significant positive gradient with the incidence of functional limitations. Compared to elderly aged 60 to 70 years, elderly aged 70 to 80 years are 85% more likely to have limitations, while for the elderly aged 80 years or above, the odds greatly increase to 3.52.

Exploring the role gender and wealth play in the incidence of functional limitations, we find that females are more likely to experience functional limitations.

Education plays a role in the occurrence of functional limitations. Persons who have completed highersecondary levels of education have 22 % lower chances of experiencing some form of limitation, while those who have completed graduation have 30% lesser chance of experiencing functional limitations, compared to those who have not received any formal education.

Area of residence (rural or urban) affects the odds of experiencing functional limitations, as those living in urban areas are 10% less likely to conceive inability in performing ADLs. Marital status is seen to have an impact, as married individuals are least likely to experience limitations. No significant association of functional limitations with living arrangement is seen.

Health status of individuals, particularly thepresence of multi-morbidity, has a strong positive & significant impact on the occurrence of functional limitations.

Table 11: Results of Multivariate logistic regression

		Odds Ratio		Std. Error	95% Conf. Interval
Age Group	60-70 years (reference category)				
	70-80 years	1.85	***	0.07	1.73 -1.99
	80 years +	3.51	***	0.17	3.19 -3.87
Gender	Male (reference category)				
	Female	1.24	***	0.05	1.15 - 1.34
Wealth Tercile	Low (reference category)				
	Middle	0.81	***	0.03	0.74 - 0.87
	High	0.73	***	0.03	0.67 - 0.80
Education Level	Illiterate (reference category)				
	Primary Education	1.00		0.05	0.91 - 1.09
	Higher secondary	0.88	***	0.04	0.80 - 0.97
	Graduate or above	0.70	***	0.07	0.58 - 0.86
Residence	Rural (reference category)				
	Urban	0.91	***	0.03	0.84 - 0.98
Marital Status	Married (reference category)				
	Widowed	1.25	***	0.05	1.16 - 1.35
	Others	1.25	***	0.13	1.02 -1.52
Living Arrangement	Living with Others (reference category)				
	Living Alone	1.19	***	0.10	1.00 - 1.40
Multi-morbidity	No Diseases (reference category)				
	One chronic Disease	2.63	***	0.10	2.45 - 2.83
	Two or more Chronic Diseases	5.01	***	0.25	4.54 - 5.54
Intercept		0.20	***	0.01	0.18 - 0.22

7. Discussion

With a breakdown of thetraditional family system, the economic and social security of the elderly is under threat. Social isolation, coupled with muscular degeneration and high prevalence of chronic diseases all threaten the quality of life in old age. We find that elderly living alone, particularly women, are both more likely to belong to lower wealth terciles. A high proportion of wealthy elderly in the 80+ years age group is indication to higher rates of survival and quality of care among wealthier households. Few elderlies have availability of "income"- pension from private or government, social protection schemesorasset-based consumption. This has translated into the absence of a retirement phenomenon- notably for the elderly living alone. They are often involved in the informal sector.

The long-term employment trends tilting toward informal sector employment and lack of financial literacy are all stacked against the creation of a viable retirement plan. In a society where co-residence forms an important part of elder care and support, the prevalence of poverty among the elderly living alone points towards the need for more secure sources of income for the elderly.The introduction of the Indira Gandhi Old Age Pension Scheme was a promising step in this regard, but the coverage of the scheme needs to be enhanced. There is evidence that poorer households increase their contribution to micro pensions corresponding to a matching increase by the government (Mukherjee, 2014). This could be harnessed to gradually build a sizeable economic reservoir. Studies have suggested providing social pensions to the elderly will have multiple benefits, it can enhance older people to gain access to health care, can also improve the status of older people among families and communities, boost psychological well-being, boost school enrolment and nutritional intake, support economic growth and promote gender equality. Providing economic security to the older persons is thus a very crucial step in achieving active ageing for any country and will create synergies in welfare generation.

The need for secure sources of elderly is further intensified considering the high prevalence of chronic diseases among the elderly, and the catastrophic out-of-pocket expenses associated with these. One in three elderly are suffering from chronic diseases, and the expenses on doctors, hospitals & surgery increase linearly with age for both males & females. With absence of medical insurance, health expenses can wreak havoc on family budgets. There thus may be a need to establish schemes catering specifically to the more vulnerable sections of the society.

On both fronts of economic security and functional health, women continue to be the underprivileged sex. Elderly women are not only worse off economically, they are also more likely to have lower quality of life stemming from ADL limitations. Other factors contributing to poor functional health status include age, education and marital status of the respondents.

The findings of this study will have implications on social security and health policy design. There is a need to identify vulnerable sections of the society through the intersection of their social identities. The predisposition of certain groups towards ailments can be tackled by adequate provision of social security measures.

As a limitation of this study, we note that the existence of functional limitations is established via self-reporting by individuals. Self-rated health is not always the most reliable measure. Further, comparison of our work with previous works assessing the risk factors of ADL limitations is hindered by the definitions of functional limitations.

8. Conclusion

The provision of long term affordable institutional care may be something that needs to be achieved in the long run. Meanwhile, targeting the vulnerable sections of the society should be a priority. The results make a suitable case for regularly recording gendered-statistics on different measures of economic and social security that might help assess the resources capacity for elderly population and their ability to invest in their own health and nutritional status, particularly older women.

There is a need for the introduction of social security schemes and financial literacy to boost pension savings, which will go a long way in helping elderly men & women. While there has been an introduction of various pension and social security schemes at both national and state level, mechanisms to ensure their take-up, and mechanisms to reduce leakages need to be put in place. Increased awareness about these programs is also in order.

The introduction of further programs for targeting must emphasise on careful targeting population groups based on their vulnerability. Elderly women living alone, particularly those belonging to lower wealth terciles need specific intervention programmes. Besides a gender differential in health outcomes, other identity intersections could shape vulnerability, and adequate focus needs to be placed on these.

The strengthening of social security provisions is an immediate, essential need of the Indian elderly, and the provision of, and upgradation of existing health facilities, could alleviate some of the burdens that disabilities pose to the elderly.

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Appendix:

Table A1: Percentage of people owning assets across a wealth quantile

	Wealth Quantile		
	Low	Medium	High
House	96.68	90.77	88.35
Cycle/ Bicycle	48.87	57.06	56.72

Sewing Machine	5.38	22.40	50.77
Generator	0.10	0.46	5.28
Mixer-Grinder	2.00	25.46	73.68
Motor Cycle/ Scooter	0.89	12.36	73.20
Motor Vehicle	0.93	12.80	76.48
TV	6.44	90.79	99.27
Colour TV	3.19	82.72	98.64
Air Cooler	0.83	8.65	44.16
Clock/Watch	63.39	95.06	99.32
Electric Fan	37.42	89.88	99.04
Chair/ Table	46.69	87.96	98.88
Cot	81.49	90.14	96.61
Telephone	0.39	2.18	22.02
Cell phone	52.31	90.70	98.49
Refrigerator	0.21	9.43	74.46
Pressure Cooker	14.11	54.63	94.54
Cable/ Dish TV	1.57	63.23	93.42
Car	0.04	0.48	14.47
Air Conditioner	0.02	0.08	6.23
Washing Machine	0.02	0.53	29.09
Computer	0.01	0.35	16.42
Laptop	0.01	0.14	7.88
Credit Card	0.42	1.04	8.03
Microwave	0.01	0.09	5.18