Inequalities in Elderly Health and Wellbeing in India: An Exploration

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Editor's Note

Dear readers,

In most countries of the world, including India, population ageing is likely to become a serious policy and programmatic issue in the coming decades. UNFPA in collaboration with the Institute of Social and Economic Change, Bangalore, the Institute of Economic Growth, Delhi and Tata Institute of Social Science, Mumbai has launched a major research project to build a knowledge base on population ageing in India (BKPAI). The study focuses on social, economic, health and psychological aspects of elderly. This peer reviewed publication is second in the series of working papers based on the data gathered from seven Indian states. We are sure that the findings of this publication will help in generating a healthy debate and policy response amongst a wider cross-section of scholars, professionals, policy makers and civil society.

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ABSTRACT

In the developed world, concern has been increasing over old age health and wellbeing, but little systematic attempt has been made to examine such issues in low income countries like India, where the population has been ageing fast in recent years. This study uses a recent household survey of co-residing old in seven fast greying major Indian states to (1) derive an aggregate health-related wellbeing index (HWBI); (2) use it to examine disparities in wellbeing across 7 major states under study and a few social groups including scheduled castes and scheduled tribes; (3) explain the variances observed; and (4) suggest interventions to augment policy. The study observes high socioeconomic inequalities and group-based differentials in elderly wellbeing, and that economic independence is a strong predictor of overall health-related wellbeing. To minimize health inequalities, we suggest the National Programme for Health Care of the Elderly, an important initiative since 2010 by the Central Government, should be expanded in all the districts in rapidly ageing states, and a non-contributory universal old age pension should be instituted.

Key Words: Happiness and life satisfaction; Health inequality; Health related wellbeing; Subjective health; Psychosocial and mental health; Economic independence; Socioeconomic status (SES);

1.   Introduction

Concern over elderly health and wellbeing is rooted in traditional concepts of satisfaction and happiness as ancient as Greek, Indian, Chinese and other philosophies (Diener, 1994; Lu, 2001; Radhakrishnan, 1960; Kumar, 2003).The incidence of demographically mediated ageing has been increasing across countries, including India; and, with it, concern over elderly health and wellbeing among analysts and age watch agencies(Frey and Stutzer, 2002; Frey, 2008; HelpAge International, 2013).More recent concern, however, follows the experience in developed countries (Kaneda et al., 2011; Deaton, 2008); and rests primarily on the healthcare needs of the elderly population and on the preparedness of the public healthcare system and agencies to meet the growing demand for specialized age-related healthcare services. Mostly, this demand is due to pathological disorders, dysfunctional health and frailty that cause dependencies in activities of daily living (ADL) and erosion in psychomental health affecting later life wellbeing. At times, these problems combine with the economic insecurity of later life. But there is almost no evidence on these issues in India and many other developing countries, largely because of serious data limitations, and methodological issues relating to the subjective wellbeing (SWB) of the ageing population. Therefore, the understanding of the dimensions and determinants of elderly health and wellbeing is impeded, as is the formulation of policy and design of a suitable intervention mechanism.

Generally, subjective wellbeing—and the procedures (or scales) adopted worldwide in recent years to measure it—is considered complementary to the traditional measure of morbidity (HelpAge International, 2013; Kaneda et. al., 2011; Wan He et al., 2012). Often, however, the traditional measures do not reflect key dimensions of elderly health and wellbeing—such as, and particularly, psycho-social conditions and assessments of self-worth or self-esteem within or outside their families. Therefore, information on, and an understanding of, these subjective aspects of elderly health and their determinants is crucial to (i) assess the quality of life outcomes and (ii) design integrated policy measures to influence the later life conditions of the growing elderly population in the developing world and, particularly, in India (Bloom et al., 2011; Lloyd-Sherlock 2000).

This study has four aims.
1.   Derive an aggregate indicator of health-related wellbeing (HWB) for people aged 60 years and older, combining aspects of functional health, chronic health conditions, disabilities, subjective health assessments using the standard GHQ-12 scale, self-assessed health ratings, recent experiences of ill health, and satisfaction with life based on the SUBI-9 scale.

2.   Examine disparities in terms of the aggregate HWBI across states and standard groups based on socioeconomic status (SES), demographics and other key predictors.

3.   Analyse and explain observed variance in the HWBI and a few of its major determinants. The main motivation of the analytical models is to understand which variables explain the differentials in aggregate wellbeing, accounting for variances between and within groups (e.g. differentials across states as well as between socioeconomic, demographic and social groups within a particular state).

4.   Identify policy measures to augment existing interventions (such as those related to old age social security or healthcare measures), and/or lead to fresh thinking on an integrated set of policy instruments, which can influence aggregate wellbeing and help improve quality of life outcomes at later life years.

The remainder of this study is divided into five major sections. Section 2 discusses the antiquity of the concept of wellbeing and its complexities that pose serious measurement issues for the empiricists. This discussion may help us to clarify our own position and the methodology adopted by us in our empirical investigations. Section 3 describes the data on health domains under consideration, including functional capabilities to perform daily activities of life, self-assessed current and relative health, chronic and acute ailments, memory condition assessed on the basis of quick recall of words and feelings about self-worth generally used in available literature as an indicator of elderly wellbeing. This section also describes the methodology used to examine inequalities and a few econometric exercises to identify their causal factors. This is followed by a discussion of the results. At the end, Section 6 summarizes the findings and makes a few suggestions for policy.

2. Health, Life Satisfaction and Wellbeing: Conceptual Moorings and Measurement Issues

Despite the complexities and methodological challenges in defining wellbeing, scholars agree that it has three important underpinnings surrounding this concept:
1.   it is subjective and rests on individual's experience;
2.   it involves both negative and positive feelings or sentiments; and
3.   it may not be viewed narrowly or remained confined to assessment of a single life domain (Diener, 1984).[1]

In its recent extension, particularly in the context of societal ageing, this concept has been drawing attention from various perspectives, including economic, psychological and those pertaining to gerontology. It helps to both judge age-related policies adopted by public agencies and to understand the outcomes for which individuals have striven their whole life.[2]

In economics, where growth is more often considered as a key concern, there is a fair degree of consensus that growth serves as a means to obtain welfare, social development and other forms of economic prosperity, including better health and consumption of desired services. However, evidence suggests that consumption requirements may not remain smooth over one's life cycle, and that age may change consumption requirements greatly; in particular, the elderly may consume more of medical services, because of deterioration over time in their mental faculties and major health domains, and may therefore consume more of medical care. Psychologists and gerontologists try to view the linkages between ageing and welfare from this perspective. The discussion to follow examines the health-related wellbeing of the elderly using methodology drawn from the more recent literature on this subject (HelpAge International, 2013; Kaneda et al. 2011; Wan Heet al.,2012). This study includes objectively assessed chronic health conditions along with self-perceived (self-assessed) physical, mental and functional health.

3. Methodology and Data Source

3.1 Data Source

As explained, this study was designed to examine the health aspects of people in the age group of 60 years and older cross-classified by a few important socioeconomic attributes. The study rests largely on the premise

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[1]   We are largely guided by some of these underpinnings in application of this entire concept of wellbeing.

[2]   A recent study by Ulloa et al. (2013) seeks to provide a detailed review of literature on ageing and welfare from different perspectives.

that later life wellbeing hinges critically on overall health and wellbeing, and that socioeconomic and other factors have a role in determining such wellbeing. To examine this in addition to many other aspects of elderly life in India, a household survey with co-residing elderly men and women was conducted in 2011 by the United Nations Population Fund (UNFPA) and its two partner institutions—Institute of Economic Growth, Delhi and Institute for Social and Economic Change, Bangalore.[3] The survey was conducted in seven rapidly ageing states—Odisha, West Bengal, Punjab, Himachal Pradesh, Maharashtra, Tamil Nadu and Kerala. Two sets of questionnaires— Household Schedule and Individual Elderly Schedule—covering most domains of elderly health were canvassed during the survey. These include:

Self-assessed (self-perceived) health (representing general health and wellbeing)

Functional capabilities including activities of daily living and instrumental activities of daily living (ADL and IADL) representing functional health and wellbeing

12-item GHQ (representing psychomental health and wellbeing)

9-item SUBI (representing self-satisfaction/self-worth or dissatisfaction/distress in life).

Apart from these mostly subjective health indicators, a set of questions were also included to generate information on the presence of certain chronic conditions and any experience of recent illnesses, involving either ambulatory or hospitalized care (Alam et. al, 2012).

3.2: Sample Design of the Survey

The sample size of the survey used for this analysis, fixed at 1280 households with a minimum of one elderly co-resident, was split equally between urban and rural areas, irrespective of the proportion of urban and rural population. Eighty Primary Sampling Units (villages or urban wards)—40 urban and 40 rural—with 16 households per Primary Sampling Unit (PSU) having an elderly co-resident were covered in the survey. The respondents to the Household Schedule included any usual resident member above the age of 15 years, while in the case of the Individual Schedule, all those aged 60 years and above in the sampled households were considered respondents and were interviewed.

The urban and rural samples within each state were drawn separately. The PSUs in the rural areas were villages, whereas the urban wards were the PSUs in the urban areas. First, villages were classified into different strata on the basis of population size, and the number of PSUs to be selected was determined in proportion to the population size of each stratum. The PSUs were selected using the probability proportional to population size (PPS) technique. Within each selected PSU, elderly households were selected through systematic sampling procedure. Samples from urban areas were drawn using a similar procedure.

Sampling weights were generated at household and individual levels separately for rural and urban areas. Later, the design weight was calculated by adjusting for non-response at both the household and individual level. The sample weights were normalized at the state level to obtain standard state weights for each of the seven states so that the total number of weighted cases equalled the total number of un-weighted cases.

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[3]   For various details about the survey – e.g., household schedules, survey timings, sample design and sampling errors, etc. - see UNFPA (2013).

3.3: Construction of Aggregate HWBI

To start with, a total often available health-related variables were combined to form seven major health and wellbeing domains. Each of those domains and their indicators are explained as below.

Table 1: Domains and Indicators

Sl No	Health and Wellbeing (HWB) Domains	Indicators/Variables
1	Self-assessed Health (SAH)	Ordered categories of SAH (current), SAH (relative to a year ago) and SAH (relative to peers)
2	Functionality	Extent of help required for ADL and IADL; used the aggregate ADL and IADL scores
3	Subjective Health Status	Based on General Health Questionnaire (GHQ-12)
4	Life Satisfaction	Based on Subjective Wellbeing Inventory (SUBI-9)
5	Chronic Health Conditions	Count of chronic health conditions
6	Short-term Health Conditions	Presence/Incidence of any short-term ailment during the last 15 days
7	Cognition	Number of words quickly recalled (total words 10)

As each of these domain indicators pertain to distinctly different component variables, and are measured in different scales and ranges, the first step involves in 'normalizing' the domain values into a common scale. To do this, we apply a simple re-scaling formula, similar to the goalpost calculations used for common indices such as the HDI:

$$[\_\_ - \_\,\_] \,\_\_ = [\_\_\_ - \_\,\_]$$
$$\_\ 100 \ _____$$

Where, __ is the raw value of the domain indicator(s) for the ith observation, _ _ denotes minimum value and ___, the maximum value of the observed series of the domain indicator (R), and __is the re-scaled value of the domain indicator, for the ith observation. We multiply the values by 100 so that the indicator takes values in the range 0-100. For the component (domain) indicator as well as the aggregate HWBI, a higher value denotes better health status.

Formation of aggregate HWBI

These seven domain indicators were combined using factor analysis, and regression-based scoring methods to derive an aggregate HWBI. To allow unobserved heterogeneity or state-specific unobserved parameters that might have a differential contribution to the HWBI across the states, we allow different intercepts for each state-subsample, and estimate the aggregate index by running the factor analyses on those separate sub-samples and normalizing them to a scale of 0–100 following the goalpost method.

3.4: Estimation of heterogeneity in aggregate health-related Wellbeing: Analytical Methods and Models

To analyse the degree of inequality or observed heterogeneity in the aggregate health-related wellbeing, we start with the conventional Gini index and Lorenz curves to observe overall variance (or inequality) in all domain indicators and overall indices. As a summary measure of inequality in the aggregate HWBI, we use the health concentration curves (HCC) and concentration indices (CI).[4]

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4 For a detailed discussion on health inequality and its measurements by using methods such as concentration curve and concentration index, see O'Donnell et al (2008). This study closely follows the procedure described by O'Donnell et al (2008, chapters 7 and 8) for measurement of concentration curve and concentration index.

The Concentration Index, conceptually derived from the concentration curve, quantifies the degree of inequality in a health variable caused by certain socioeconomic factors (Kakwani et al., 1997; Wagstaff et al., 1989). Beginning with the poorest to the richest, the concentration curve on x-axis shows the cumulative percentage of the sample ranked by living standards. Similarly, the y-axis indicates the cumulative percentage of health variable corresponding to each cumulative percentage of the distribution of living standard variable (O'Donnell et al. 2008).

Figure 1 illustrates a concentration curve where the health variable is ill health, which remains higher among the poor in this example than among the rich. The Concentration Index is
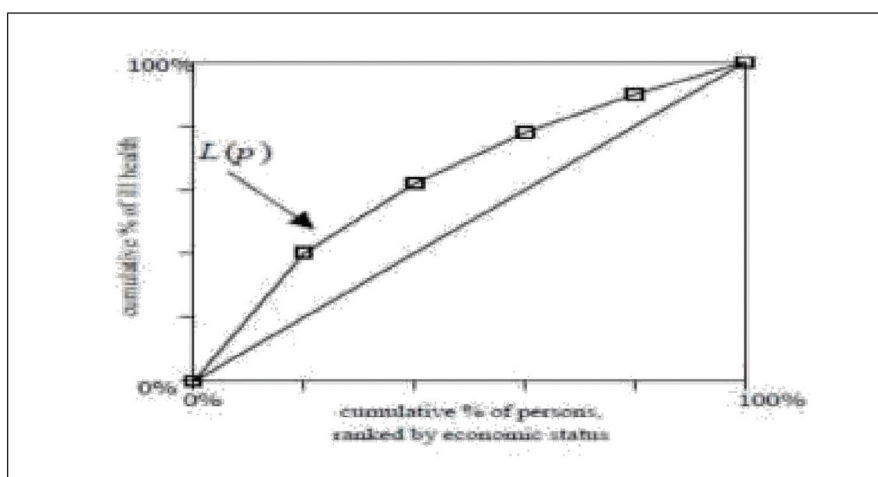
defined as twice the area between the concentration curve, L (p), and the line of equality (the 450 line running from the bottom-left corner to the top-right). So, where there is no income-related inequality, the Concentration Index is zero. Conventionally, the index takes a negative value when the curve lies above the line of equality, indicating disproportionate concentration of the health variable among the poor. It takes a positive value when it lies below the line of equality. If the health variable is a bad one, such as ill health, a negative value of the Concentration Index means ill health is higher among the poor.

Mathematically, the Concentration Index may be represented as:

$$C = 1 - 2 \int_0^1 L_n(p)\,dp$$

The index is bounded between –1 and 1. For a discrete living standards variable, it can be written as:

$$C = \frac{2}{N\mu} \sum_{i=1}^{n} h_i r_i - 1 - \frac{1}{N},$$

Where, hi is the health variable, μ is its mean, and ri = i, N is the fractional rank of individual i in the living standard distribution, with i = 1 for the poorest and i = N for the richest.

The Concentration Index (C) can be computed by making use of the "convenient covariance" result as below:

$$C = \frac{2}{\mu} \text{cov}(h, r)$$

5

Where h is the health variable whose inequality is being measured, μ is its mean, ri is the ith individual's fractional rank in the socioeconomic distribution (e.g. the person's rank in the income distribution), and cov (..) is the covariance.

Descriptive results and statistics are used to compare inequality averages across background attributes. For the analysis of the determinants of overall HWBI and its differentials, we used the ordinary least square (OLS) regression and its non-linear variants, such as ordered probit models.

4.   Empirical Results

4.1:   Socioeconomic and Demographic Differentials in Health and Wellbeing Outcomes

Using a few selected background characteristics, Table 2brings out the socioeconomic and demographic differentials separately for each of the seven health and wellbeing outcome domains. The first major point emanating from this table is that, in all seven dimensions, health and wellbeing among men is better than among women. These gender differentials are visible in almost every major domain—barring acute and chronic conditions—including self-rated health, functionality, life satisfaction ratings, cognition, etc. Moving to income level (characterized by monthly per capita consumption quintiles), the pattern is relatively straight forward: apart from acute health status or short-term morbidities, for which the gradient is almost flat across the quintiles, the rich generally enjoy better health and wellbeing status than the poor.

Table 2: Socioeconomic and demographic inequality in individual health and wellbeing outcome domains

Socioeconomic Attributes	Self-Assessed Health	Functionality	Subjective Health Status	Life Satisfaction	Acute Health Status	Chronic Health Status	Cognition
Age Group							
60-69	57.2	83.5	72.1	45.8	89.4	92.5	43.8
70-79	53.1	75.3	68.5	42.1	87.5	89.9	37.8
80+	49.7	63.4	65.3	38.0	85.3	87.4	31.9
Residence							
Rural	54.8	78.1	69.9	43.2	87.8	91.2	39.9
Urban	56.4	81.9	71.5	46.0	90.2	91.5	43.3
Sex							
Male	57.5	80.1	72.1	46.4	88.7	91.8	43.8
Female	53.3	78.2	68.8	41.7	88.2	90.8	38.2
States							
Himachal Pradesh	60.8	77.8	74.1	49.6	89.4	91.4	43.5
Punjab	53.2	78.6	78.5	50.3	92.9	87.7	41.9
West Bengal	45.3	74.6	64.1	31.4	82.3	91.5	33.4
Odisha	54.7	74.2	65.9	40.1	92.7	94.9	38.2
Maharashtra	64.3	81.6	71.8	38.6	87.0	89.7	43.2
Kerala	53.5	84.3	73.4	57.1	82.7	87.6	37.4
Tamil Nadu	53.6	82.5	64.6	40.0	91.2	95.6	47.1
MPCE Quintile							
1st	52.1	80.2	66.6	36.9	89.7	92.8	39.7
2nd	54.5	78.4	69.2	41.3	88.9	92.7	39.8
3rd	55.2	78.0	70.7	43.6	88.3	91.1	40.9
4th	56.5	79.0	71.4	46.1	88.2	90.7	41.1
5th	58.0	79.9	73.9	51.8	87.2	89.1	42.7

Years of Schooling							
No schooling	52.5	74.7	67.4	38.6	88.6	91.2	36.9
1-4 years	55.4	80.1	70.4	43.6	85.7	90.1	38.7
5-7 years	56.3	82.7	72.4	47.7	87.5	91.4	42.5
8+ years	60.8	86.4	75.9	54.2	90.2	91.8	50.1
Marital Status							
Currently married	57.3	81.5	72.2	46.6	89.1	91.7	43.5
Widowed/Separated	52.2	75.4	67.5	39.9	87.5	90.6	36.7
Total	55.3	79.1	70.4	43.9	88.5	91.3	40.8

Interestingly, a significant departure from this pattern is noted in the case of chronic health conditions, evidencing a complete reversal of the economic gradient in health and health-related wellbeing. The poor, for example, are found to have better health status in terms of chronic conditions and the worst follows with improvements in consumption quintiles. Poor also enjoy better functionality (Table 2). Education demonstrates significant variation across all the health domains under consideration; the scores indicate a steady rise in better health and wellbeing outcomes with increasing educational level. Lastly, indicating the linkages between living arrangements, particularly spousal co-residence on health and wellbeing dimensions, currently married elderly respondents enjoy better health and wellbeing status than widows or separated elders. Although these results indicate socioeconomic differentials in the health and wellbeing domain indicators used for deriving the aggregate HWBI, a summary indicator of inequality, such as the Gini index, provides a snapshot of overall heterogeneity or variance in the component indicators, and not using any particular predictor variable or characteristic (such as education or income). Table 3 presents the values for the overall inequality for each of these indicators.

Table 3: Summary Indicators of Health Inequality: Gini index for Major health Domains

Main Health Outcomes	Gini Coefficient
Self-Assessed Health	0.20
Functionality	0.11
Subjective Health Status	0.11
Life Satisfaction	0.27
Acute Health Status	0.10
Chronic Health Status	0.05
Cognition	0.23

4.2: Average Disparities in Health-related Wellbeing

Here, we examine disparities in aggregate health-related wellbeing by comparing average values of the HWBI across the categories of selected background characteristics used earlier in Table 1.The broad patterns emerging from the results in Table 4 reiterate the gradients observed for the individual HWB domains in Table1; but a few stark facts bear attention. For example, demographic differentials in the aggregate HWBI, such as variations across various age groups or between males and females, are higher than that observed in the case of component or domain indicators. This is partly due to the additive nature of the index, but it brings out clearly that the burden of poor health-related wellbeing outcomes intensifies with age, and is much higher among females than males.

Table 4: Socioeconomic and Demographic Inequalities in Aggregate Health-Related Wellbeing

Attributes	Aggregate HWBI
Age Groups	
60-69	60.8
70-79	55.1
80+	48.9
Place of Residence	
Rural	57.2
Urban	60.1
Sex	
Male	60.1
Female	56.0
State	
Himachal Pradesh	61.2
Punjab	60.7
West Bengal	49.5
Odisha	55.4
Maharashtra	59.6
Kerala	60.5
Tamil Nadu	58.1
MPCE Quintile	
1st	55.4
2nd	57.0
3rd	57.7
4th	58.7
5th	60.9
Years of Schooling	
No Schooling	54.1
1-4 years	57.4
5-7 years	60.4
8+ years	65.6
Marital Status	
Currently married	60.3
Widowed/Separate	54.2
Total	57.9

It appears that the elderly in West Bengal have the worst health-related wellbeing outcomes, while their peers in Himachal Pradesh have the best. It is difficult to comment on the result without other supporting evidence, but poor levels of subjective health, particularly for life satisfaction based on the SUBI scale, and the GHQ-12 ratings for the elderly in West Bengal, are likely to negatively impact the overall HWBI.[5] Socioeconomic inequality in aggregate health-related wellbeing among the elderly in our sample is found to be significantly high. In fact, education is seen above to have a higher discriminatory power than direct economic measures of consumption expenditure per capita; the gap, or the range differentials, between elderly with no education and those with eight or more years of education is much higher than the interquartile range values between the poorest and richest MPCE quintile.

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[5] It may be noted that the factor loadings, or the regression scores derived during the factor analysis accorded higher values for both these dimensions – subjective health status and life satisfaction – and these two variables, along with self-rated health (which also had a high score in the derivation of the aggregate index) were the component domain indicators with higher variability, as noted in terms of the Gini coefficients of Table 2.

To go a little further into these issues, particularly in terms of household income or monthly per capita consumption expenditure as a welfare variable, we present a conventional Concentration Index and its graph in Table 5 and Figure 2. This index, as was mentioned earlier, has largely been derived on the lines suggested by O'Donnell et al. (2008).

Table 5: Concentration Indices for Aggregate HWBI across States

| State	Concentration Index (CI)
Himachal Pradesh	0.026
Punjab	0.011
West Bengal	0.044
Odisha	0.019
Maharashtra	0.013
Kerala	0.014
Tamil Nadu	0.012
Full Sample	0.021

The Concentration Index (CI) is analogous in spirit to the Gini index of inequality, which is used extensively in analysing income inequality. The CI provides a summary estimate of the extent of health inequality related to socioeconomic factors. Stated simply, it takes up values between -1 and 1, with a negative value denoting a higher concentration among the poor and viceversa. In the case of the HWBI, which takes up increasing values in health (i.e. a higher value of the index denotes better health), a negative (positive) value of the CI indicates a lower health inequality—aggregate health-related wellbeing is better among the poor (rich). As all the CI values in Table 5 show, socioeconomic inequality in aggregate health-related wellbeing in all the states favours the rich. The poor have lower levels of HWB in all states under reference.

Figure 2: Concentration Curve for Socioeconomic Inequality in Aggregate Health-related wellbeing
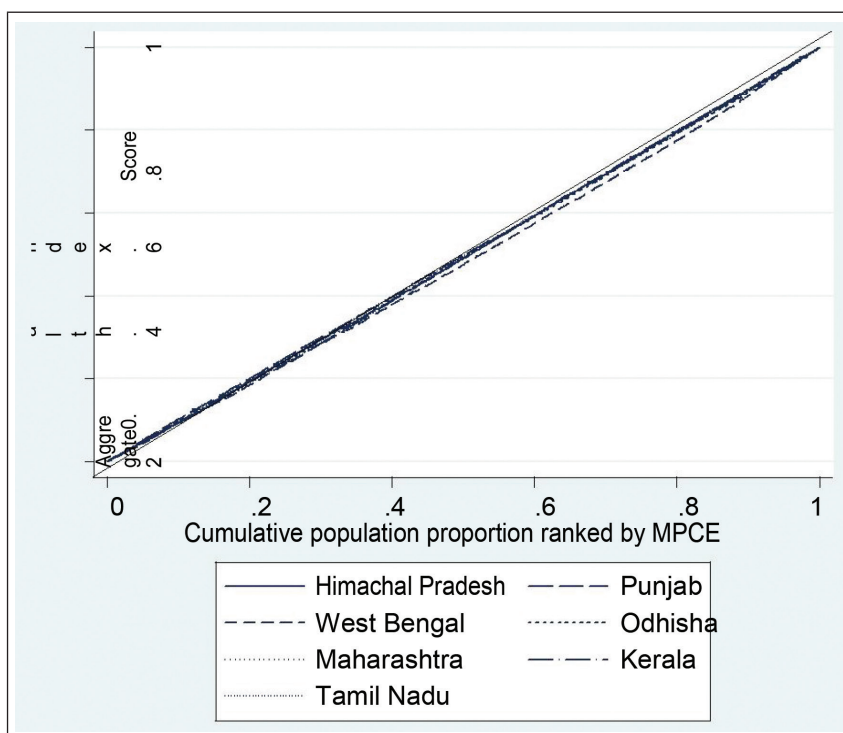
9

Panel 1: Combined Sample
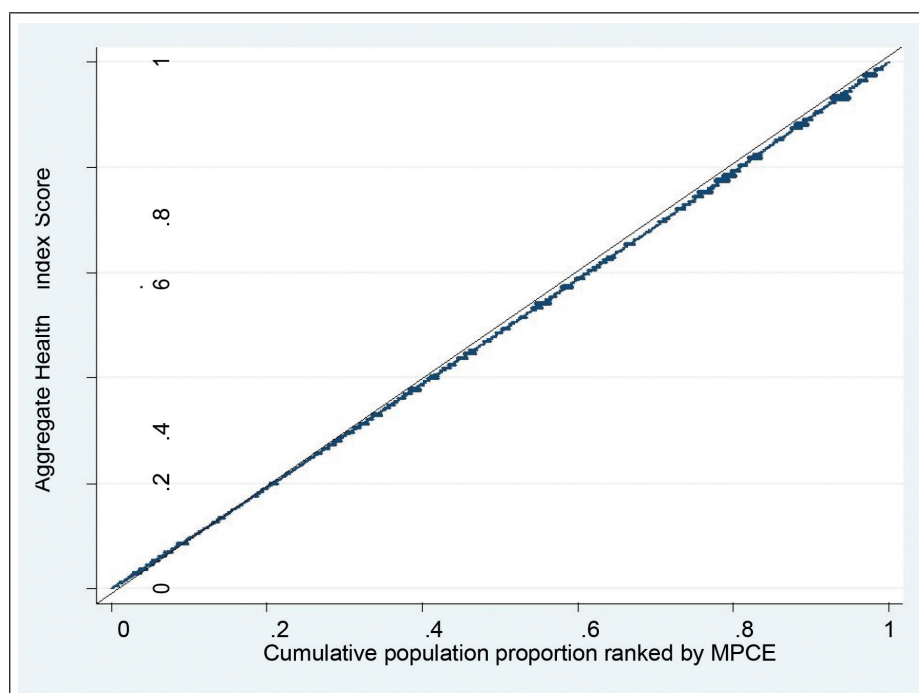
Panel 2: Rural and Urban Samples
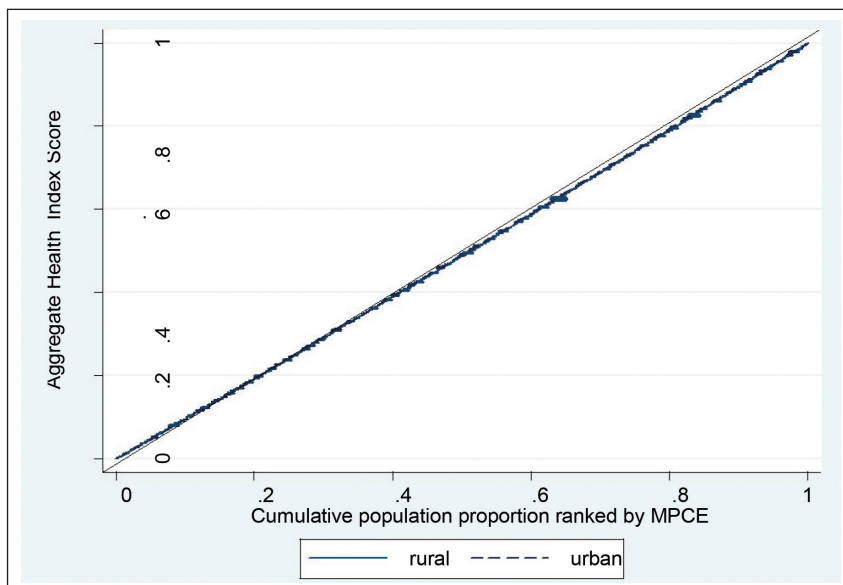
Panel 3: Concentration Curves by States

4.3: Multivariate Models – Determinants of Inequality in Health-related Wellbeing

In the multivariate models, we run two different specifications. The first considers the health outcome in its original continuous scale form, i.e. the score values of the aggregate HWBI. Accordingly, OLS regressions are run to obtain the parameter estimates for different predictor variables characterizing socio-cultural, demographic, spatial and economic aspects. The OLS results are given in Table 6.

The second model uses a different form of the dependent variable, i.e., the HWBI scores. The scores were tabulated in three ordered categories denoting poor, moderate, and good levels of aggregate health-related

wellbeing. The cut-offs were chosen to divide the original range of the HWBI scores into equal ranges, i.e. 0-33, 34-66, and 67-100. The model used in our exercise for estimating ordered response categories is therefore the ordered probit. Table 7 reports the estimates drawn on the basis of the ordered probit for the full sample (with state level fixed effects) and separate models for each of the 7states.

The parameter estimates of the OLS regression (Table 6) reaffirm the patterns emergent from the descriptive results earlier. In addition, and highlighting the significant inter-regional inequality in health and wellbeing outcomes, the results highlight strong variations across states. Based on the full sample results, it is evident that better health and health-related wellbeing outcomes are concentrated in urban areas, among currently married elderly, those with better education, the upper castes, and higher MPCE classes. In other words, the results indicate high socioeconomic inequality and group-based differentials among the elderly in terms of health-related wellbeing outcomes. In states such as West Bengal, the inequality levels are extremely high—HWBI levels among the elderly in the richest MPCE class are nearly 10 times high than those in the poorest class, and those with eight or more years of schooling have nearly eight times higher health outcomes. However, to an extent, economic disparities in the aggregate outcome indicator are not statistically significant in states such as Punjab, Odisha and Himachal Pradesh, and the gradient evidences a sudden jump only at the extremes. The results, both from the combined sample model as well as the state-specific results (except Maharashtra), do not indicate any significant, systematic gender differential in the wellbeing outcomes; but being widowed/ single or divorced is found to be associated with poorer outcomes.

Lastly, economic independence emerges as a very strong predictor of overall health-related wellbeing. Except for Odisha and Punjab, elderly reporting some amount of earning (or income) enjoys better health outcomes. This most likely reflects the pathways of economic independence and sense of security influencing better psycho-mental health conditions, and thereby influencing subjective health assessments such as those captured by the SUBI and the GHQ-12 scales.

Turning to an ordered categorical functional form of the aggregate outcome indicator, and allowing for a non-linear relationship between the outcome and the predictor variables included in the OLS model, the results of the ensuing ordered probit model are presented in Table 7. The coefficients estimated largely suggest a similar pattern as was the case with OLS. For example, the extent of socioeconomic inequality in overall health-related wellbeing is clear and persistent. Overall, the elderly from the richest MPCE class have a 43 per cent higher probability to be in the highest or best HWB state compared to those in the poorest quintile; for those with over eight years of education, a nearly five-fold higher likelihood is apparent. In fact, the strong inequality in terms of education is identified on a near-equal level across all seven states under consideration, the highest being Tamil Nadu. However, for the MPCE classes, the disparities are not marked enough or statistically significant once other socioeconomic factors such as education is controlled. West Bengal, as highlighted earlier, is an outlier. The influence of economic independence, or regular cash flow, continues to be in effect, with a higher likelihood for income earners to experience better overall health and wellbeing.

Figure 3 summarizes the findings from the multivariate models, using predicted probabilities of the categorical HWBI outcome variable from the ordered probit regression results. As may be noticed, the elderly in Maharashtra and Kerala enjoy the best health-related wellbeing levels, while West Bengal has the highest proportion of aged with poor HWBI outcomes.

Table 6: Results of OLS Regression Model:
Determinants of Aggregate Health-related Wellbeing, All Sample and States

Explanatory Variables	Full sample	Himachal Pradesh	Punjab	West Bengal	Odisha	Maharashtra	Kerala	Tamil Nadu
Urban residence	1.515***	2.271**	0.179	1.872*	1.771*	0.48	1.286	1.377
Agegroup (60-69®)								
70-79	-4.672***	-2.730**	-4.859***	-5.785***	-4.172***	-5.002***	-4.133***	-5.972***
80+	-10.389***	-9.149***	-11.355***	-10.196***	-8.747***	-12.055***	-11.135***	-8.826***
Female	0.125	0.617	-2.145	0.871	0.071	2.657**	0.368	0.936
Widowed/separated	-2.865***	-3.346***	-0.374	-3.748***	-2.364**	-5.503***	-3.210***	-2.503**
Years of Schooling (No Schooling®)								
1-4 years	3.435***	5.686**	3.848*	0.48	4.210***	4.133***	4.795***	2.980*
5-7 years	4.880***	4.664***	3.078*	1.362	4.096***	4.902***	6.159***	8.325***
8+ years	10.795***	9.212***	6.886***	8.741***	12.374***	10.070***	12.416***	14.498***
Social groups (Scheduled castes/tribes ®)								
OBC	0.161	5.017***	-0.162	-0.03	0.423	-0.463	-1.844	1.484
Upper/general castes	1.270***	3.472***	0.587	-0.091	1.786	0.546	1.313	2.405
MPCE Quintile (Poorest quintile ®)								
2nd	1.039*	2.48	-0.536	3.804**	1.683	1.697	3.433*	-1.215
3rd	1.105*	1.138	0.058	4.302**	1.014	3.890***	4.111**	-3.140**
4th	1.473**	2.46	-0.803	6.005***	1.003	2.388*	5.077***	-1.866
Richest	3.039***	3.891*	1.776	10.499***	3.246*	4.255***	3.453**	0.668
Economic activity status (never worked ®)								
No paid job in last 1 year	-1.801***	-0.668	-3.273*	-0.258	-2.043	0.381	0.25	-5.502***
Had paid jobs in last 1 year	1.302*	1.895	2.214	5.065**	4.370**	2.269	3.056*	-6.602***
Earns some/any amount of income	2.549***	3.209**	1.066	2.664**	1.325	2.205*	2.834***	3.404***
N	9810	1480	1366	1275	1481	1422	1343	1443
Adj R-squared	0.283	0.259	0.199	0.283	0.239	0.252	0.307	0.355

* $p<0.05$; ** $p<0.01$; *** $p<0.001$

Dependent variable: Normalized scores (0-100) of aggregate HWBI

Table 7: Results of Ordered Probit Model:
Determinants of Aggregate Health-related Wellbeing, All Sample and States

Explanatory variables	Full sample	Himachal Pradesh	Punjab	West Bengal	Odisha	Maharashtra	Kerala	Tamil Nadu
Urban residence	1.267***	1.426**	1.257	1.01	1.395*	0.995	1.161	1.472**
Agegroup (60-69®)								
70-79	0.507***	0.711*	0.441***	0.518***	0.568***	0.482***	0.499***	0.321***
80+	0.239***	0.296***	0.182***	0.267***	0.250***	0.220***	0.218***	0.216***
Female	0.93	0.969	0.88	1.342	1.074	1.319	0.897	1.041
Widowed/separated	0.656***	0.632**	0.954	0.506***	0.644**	0.470***	0.623**	0.75
Years of Schooling (No Schooling®)								
1-4 years	1.660***	2.213**	2.088**	1.034	1.729**	1.868***	1.755**	1.927*
5-7 years	2.073***	1.892**	1.641*	1.158	1.502*	2.504***	2.175***	4.350***
8+ years	5.054***	4.107***	2.460***	2.912***	4.422***	5.536***	5.840***	16.911***
Social groups (Scheduled castes/tribes ®)								
OBC	0.999	1.763*	0.965	1.722*	1.082	0.81	0.887	1.107
Upper/general castes	1.11	1.487**	0.967	1.078	1.431*	1.018	1.3	1.173

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MPCE Quintile (Poorest quintile ®)								
2nd	1.155	1.143	0.851	1.706*	1.285	1.171	1.751*	0.798
3rd	1.112	0.846	0.832	1.769**	0.989	1.617*	1.891**	0.69
4th	1.211*	0.904	0.814	2.483***	1.096	1.554*	2.186***	0.766
Richest	1.437***	1.213	1.23	4.327***	1.610*	1.593*	1.591*	1.183
Economic activity status (never worked ®)								
No paid job in last 1 year	0.683***	0.939	0.729	1.105	0.9	0.893	0.888	0.298***
Had paid jobs in last 1 year	0.939	1.079	1.403	2.153**	1.887*	1.347	1.253	0.192***
Earns some/any amount of income	1.506***	1.394*	1.022	1.400*	1.484**	1.183	1.851***	1.997***
Pseudo R-squared	0.172	0.141	0.095	0.132	0.127	0.139	0.178	0.296
N	9810	1480	1366	1275	1481	1422	1343	1443

* $p<0.05$; ** $p<0.01$; *** $p<0.001$

Dependent variable: Ordered categories of aggregate HWBI – Poor HWB (0-33, coded '1'), Moderate HWB (34-66, coded '2') and Good HWB (67-100, coded '3')

Economic inequality in aggregate HWBI outcomes is heightened by the summary plot: while 40 per cent of the elderly in the richest quintile are found to have 'good' HWBI outcomes, only about 25 per cent of their counterparts in the poorest quintile are found so. Similarly, education only contributes to intensifying socioeconomic disparities in the outcome. Nearly 40 per cent of the elderly in urban areas—but only 27 per cent in rural areas—have good aggregate health outcomes.

Figure 3: Predicted probabilities of aggregate health-related well-being categories according to selected background characteristics
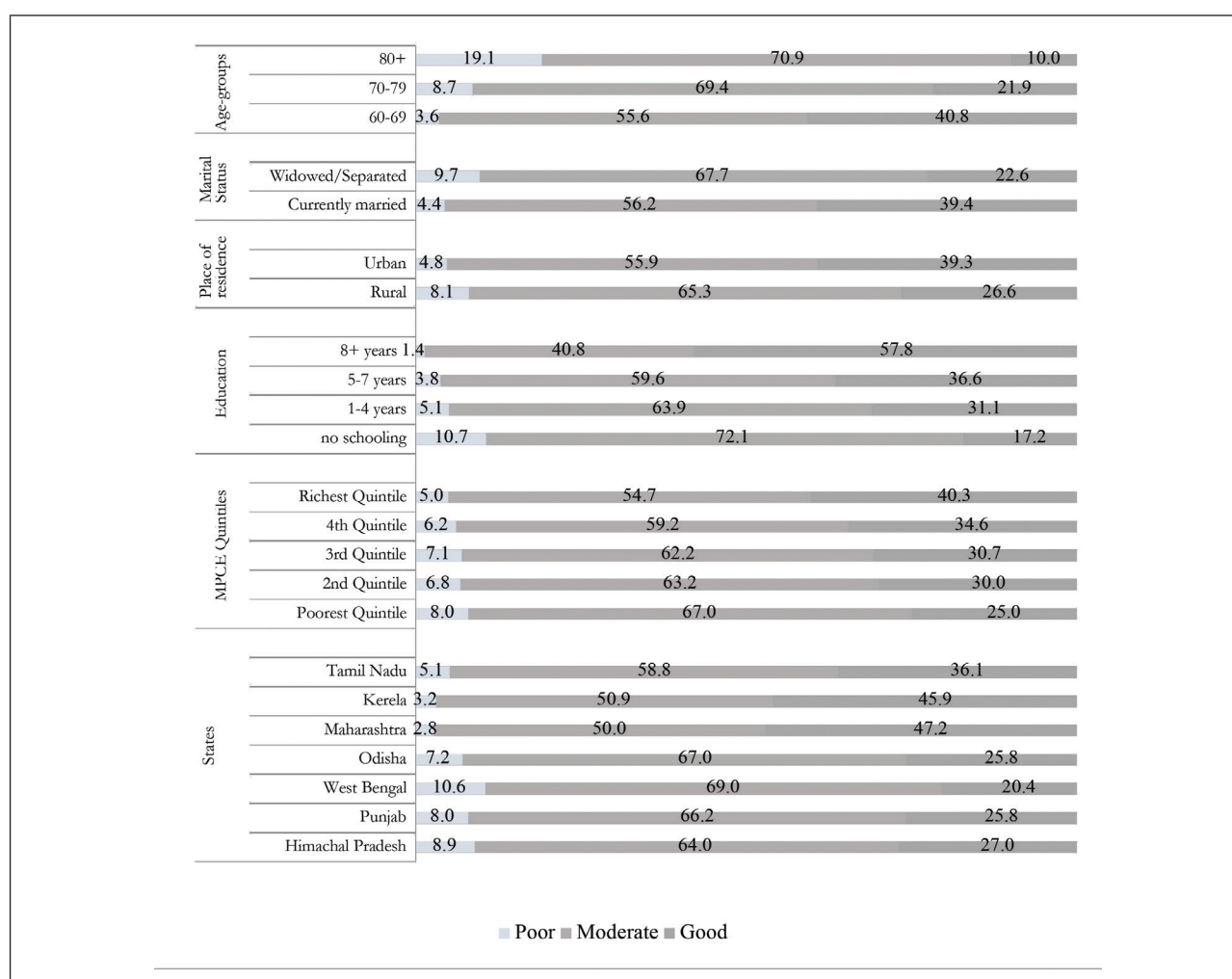
5.   Discussion of Major Findings

This paper attempts to underline how aggregate (or summary) indicators of wellbeing, based on normalized common scores, may be derived from various health dimensions of the elderly, such as functional limitations, cognitive impairments, chronic health conditions, major sicknesses, life satisfaction, and psychomental health assessments. The issue of weighing different health dimensions is believed to contribute in many ways to old age health and wellbeing and to its importance for fast greying developing societies. The index constructed to undertake this analysis emphasizes subjective health assessments and life satisfaction scales, such as the SUBI, due to higher variance in their component indicators across different socioeconomic and spatial groups. Other health indicators, such as morbidity or self-rated health, are more evenly distributed. From this perspective, it may be argued that subjective health assessments and life satisfaction scales are more prone to capture socioeconomic influences such as income, education and living arrangements on health related wellbeing. Similarly, direct health status or illness patterns are more likely to follow the agepatterns of morbidity and functionality and are, hence, more uniform across different population groups. However, any definitive argument on this needs further analysis and more detailed data.

The results of our analysis clearly indicate significantly higher effect of socioeconomic inequality on the HWBI, and reaffirm the degenerative nature of health-related wellbeing and its constituent health dimensions along with age. It remains consistently higher among women. In terms of living arrangements, the results confirm that co-residing and married elderly enjoy better health and wellbeing. It may therefore be imperative to identify single or widowed elderly as vulnerable groups. This aspect of vulnerability cross-cuts all other socioeconomic dimensions. Both income and education play a strong role in influencing inequalities in health-related wellbeing outcomes. The rich and, more importantly, the educated enjoy better levels of health and wellbeing, which reaffirms the economic gradient in broad-based health and wellbeing measures and rationalizes the need for well-targeted interventions to reduce health-related inequalities. Ensuring a regular flow of income with the help of a well-designed universal old age pension scheme may as well contribute towards improving later life health and, more importantly, subjective health assessments.

Our findings indicate rural–urban differentials in HWB in most states and for the full sample. This health disadvantage to the rural elderly is apparently the combined effect of residential disadvantages in terms of inadequate health care infrastructure and other essential civic amenities in rural areas. Poor household environment, lack of drinking water facilities and traditional cooking practices in rural areas increase the risk of ailment and poor health status in later ages. Studies have shown that competition for scarce family resources is intensified by growing out migration, increasing work pressure, physical strain and escalation in cost of living. Altogether, these factors strain intergenerational relationships (Agewell Foundation, 2010). Such trends lead to social isolation of elderly and push them to a vulnerability situation. This is particularly true for rural areas (Ghosh & Husain, 2010). Another reason for rural-urban health gaps may include better socioeconomic circumstances in urban areas that lead to greater health-enhancing opportunities, knowledge, and resources. Conversely, better employment opportunities and access to various health and education services may not be distributed evenly in rural areas across different socioeconomic groups (Parker & Pier, 2001).

Our results clearly underline that physical age of older persons is significantly associated with overall wellbeing. Studies from other countries confirm this (Kelleher et al., 2003). Some studies also highlight that the socioeconomic status (SES) differentials in health expand through late middle-ages and start declining thereafter (Beckett, 2000; Deaton and Paxson, 1998). Health inequalities in later life have been attributed to selective mortality, social sector programmes targeting older adults, dominance of biological determinants

over social determinants at later ages, and the cohort effects (Herd, 2006). However, some studies have shown that these differentials start widening after middle age, possibly reflecting the accumulated effects of social disadvantage (Ross & Wu, 1996).

Among socioeconomic determinants of elderly health in developed and developing countries, gender is a key factor (Kalavar and Jamuna, 2011; McDonough & Walters, 2001; Roy and Chaudhuri, 2008). In most societies, despite higher levels of depression, distress and chronic illnesses, women live longer than men (McDonough & Walters, 2001), and also report more functional limitations (Gorman & Read, 2006). Evidence suggests that retirement, loss of partner and economic hardship accounts for the rise in depression among older persons irrespective of age and sex, along with physical degeneration and the loss of personal control (Mirowsky & Ross, 1992). Such losses probably will remain correlated with age, and could possibly be reduced through greater engagement of older adults into com-munity, economic, and social activities. However, research on sex differences in the health-SES relationship has been mixed. Many studies in industrialized countries report stronger SES gradients in health and mortality for men than women (Koskinen & Martelin, 1994; Elo & Preston 1996), while others record a stronger gradient for women than men (Duncan et al., 2002; Thurston et al., 2005; McDonough et al. 1999; Marmot et al. 1997). Little is known about how the SES-health linkage in developing countries differ by sex. Explanations for differential health outcomes between elderly men and women often underscore socioeconomic inequality as a fundamental cause for variations in their wellbeing (Adler & Ostrove, 1999; Huisman et al., 2003; McDonough & Walters, 2001). The theory of fundamental causes developed by Link and Phelan (1995) established that the association between SES and mortality persists—despite radical changes in the diseases and risk factors presumed to explain that association—because SES embodies an array of economic and non-economic resources, including knowledge, power, and several beneficial social connections, that protect health (Phelan et al., 2010).

Regarding education, our findings underline the positive effect of education on HWB among older population across all the seven states under reference. Education influences health by acting as a means to income and other material resources. Education influences receptiveness to health promotion messages, appreciation of health risk factors, and informed use of healthcare services; therefore, education has behavioural effects on health. The educational differences observed in this study may be explained in part by behavioural disparities between uneducated and educated in terms of intellectual capacity to comprehend, access, and utilize health promotion messages. Also, it determines the type of employment opportunities accessible to an individual (Parker and Pier, 2001). Further, it has been argued that education may increase feelings of personal control and promote better health behaviour by providing a route to higher status, well paid occupations and better pensions after retirement (Bosma et al., 1999).

From the present study, it may be argued that economic conditions appear to be a crucial factor for the elderly. This confirms the findings of earlier studies, which show a positive association between household wealth and elderly wellbeing (Guilmoto and Rajan, 2002; Rajan and Kumar, 2003; Alam, 2008; Ghosh and Husain, 2010). Elderly who have a higher per capita monthly consumption expenditure (MPCE) experienced better HWB. This finding clearly endorses studies that demonstrate a unidirectional relation between poor economic status and poor health (Ng et al., 2010). Likewise, the HWB indices turn out to be better among those elderly who engaged in economic activity in the preceding year. This suggests that the elderly with independent income sources may have control over spending as well.

The socioeconomic variations in elderly wellbeing across different states or regions may be due partly to diverse conditions in terms of access to various resources and of socioeconomic and demographic conditions

of the region or state. The states chosen by the UNFPA and its collaborating partners from the Central and Eastern regions for their household survey are characterized by lower levels of socioeconomic and demographic conditions than states in the South and North. In the chosen states, primary health care infrastructure and resources are below average, and access to these facilities is mostly skewed. An early demographic transition in most South Indian states has led them to face an increased proportion of the elderly population, but it also helped them lay the groundwork for making policies in support of the elderly and their wellbeing.

6.   Policy Directions

The government recognizes the trend of demographic ageing in India and its attendant health issues. The Central and state governments have taken a few important policy initiatives in this direction. In 2010–11, the Ministry of Health and Family Welfare (MoH&FW), Government of India launched a National Programme for Health Care of the Elderly (NPHCE). The NHPCE aims to create a network of public facilities and hospitals in more than 100 districts of about 21 states to provide geriatric medical services. It aims also to strengthen eight regional medical centres to meet the tertiary healthcare requirements of the elderly. However, many such initiatives have been mired for lack of the necessary literature and data on health issues of elderly population, especially the aetiology of old age diseases (Alam and Karan, 2014). This study, based on a large, representative sample, is expected to provide the MoHFW some key inputs for NPHCE initiatives. Two issues bear particular significance. The first emanates from the health inequalities across spatial locations and population groups, and the second arises from inter-state differentials in combinations of various health domains. The latter points to the need for profiling diseases in each state to run the elderly health care programme more effectively. Admittedly, these are complex issues and, therefore, may not be decided on the basis of one study or even a few studies; a decision needs sustained data collection and research effort.

A disturbing message emerging from our study is the poor psychomental health conditions of the elderly. What adds to its severity is that it remains common to most areas under study. Health planners may consider this issue on a priority basis. New research on psychomental issues and feelings about self-worth or life satisfaction among the elderly is also warranted.

Planning for old age health in India remains handicapped on two counts. One is of course the lack of proper understanding about the pathways of various diseases and how these pathways vary across gender, places and population groups. This leads to supply side slippages in medical infrastructure including medical manpower. Another problem is that Indian disability law does not recognize age-related functional disabilities and, despite amendments, rely mostly on clinical approaches to disabilities.[6] The social approach, advanced by Nagi (1965), is more holistic, and considers the age-related lack of autonomy in ADL a source of disability. Our study, by using ADL/IADL as an entirely separate health domain, tries to advance the debate on functional disabilities and care requirements at later ages. It also seeks to invite the attention of public officials to consider the lack of functional competence in higher ages as an important source of disability and a serious issue for planning geriatric healthcare services. Insurer agencies may also consider developing specific products to cover risks of functional disabilities in later ages.

This study conforms to the existing literature on factors of health status, and suggests also that economic independence is an important source of health-related wellbeing. This gives sense to the growing demand in the country for a state-financed universal old age pension scheme. In most market-oriented economies, such

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[6]   A clinical approach to disability invariably relies on a pathologically triggered concept of poor health followed by impairment, functional limitations, disabilities, and ultimately end of life.

a strategy is a normal means of providing social security to the elderly. Even a tiny and very low income South Asian nation like Nepal has considered it wise to pay its elderly a universal old age pension. India, with all its demographic advantages and economic potential, may as well consider such a pension scheme. This study lends some justification to raise this debate further.

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About the Project

The United Nations Population Fund - UNFPA supported project BUILDING KNOWLEDGE BASE ON POPULATION AGEING IN INDIA aims at contributing and further expanding the existing knowledge base on the emerging population dynamics in India which are resulting in significant shifts in the age structure towards higher proportions of older persons aged 60 years and above. In first stage, the project supported the preparation of a series of thematic studies using existing secondary data sources. In the second stage the project initiated a primary survey in seven states in India. Dissemination of the findings to various stakeholders is a key objective of the project to help enhance the overall understanding of the situation of elderly in the country for further research and policy analysis on the growing numbers of India's senior citizens. The project is a partnership between the Institute for Social and Economic Change (ISEC), Bangalore, the Institute of Economic Growth (IEG), New Delhi and Tata Institute of Social Sciences, Mumbai

More information on the project can be obtained from www.indiaunfpa.org or http://www.isec.ac.in/prc.html

The second phase of the project involves an updated situation analysis through the collection of primary data from seven states in India which have relatively higher proportions of elderly. These are Himachal Pradesh, Kerala, Maharashtra, Orissa, Punjab, Tamil Nadu and West Bengal. The survey data includes socio-economic characteristics, family dynamics, living arrangements, health and awareness of social security programmes of the elderly. This paper is based on the data gathered from the seven states.

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