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Socio-economic inequalities in health among older adults in two rural sub-districts in India and Bangladesh: A comparative cross-sectional study

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Abstract

Health inequalities have been observed among older people in many developing countries, particularly among those with least social protection and low socio-economic (SES) status. This study attempted to examine effects of SES on the health of older adults, and related gender differences, in two rural sub-districts - Matlab, Bangladesh and Vadu, India. The study utilised the WHO SAGE-INDEPTH Wave 1, 2007 Matlab, Bangladesh and Vadu, Pune District, India datasets. Both gender and SES indicators were strongly associated with all health indicators of older adults in the Bangladesh site, whereas in India, education and asset quintiles were not consistently associated with a self-rated health, quality of life and functional ability score but gender was consistently associated with all health indicators except the quality of life score. The SES-health gradient was noticeably higher amongst older adults in Matlab, Bangladesh than in Vadu, India. Education was also found to be an important predictor of health outcome in both sites.

KEYWORDS: Socio-economic status, health indicators, older adults, Bangladesh, India

Introduction

Socio-economic status (SES) differentials in health are well established in western developed countries. Individuals with lower SES are more likely to experience numerous health problems and higher rates of mortality compared to those of higher SES (Rahman, Khan, & Hafford-Letchfield, 2015; Marmot & Wilkinson, 2001; Pappas, Queen, Hadden, & Fisher , 1993; Williams, 1990). This so-called 'SES-health gradient' has been observed in many studies of people from different age groups across a wide range of SES determinants, health indicators and methodologies (Smith, 1999; Goldman, 2001). Investigations into the links between SES and health have identified a broad set of contributory factors including poor knowledge about health and unhealthy behaviours amongst the lower SES groups; unequal access to quality medical care; deprivation and stressful psychological environments in both living and work place environments over the life course (Williams, 2005; Marmot, Banks, Blundell, Lessof & Nazroo, 2002; Lantz et al., 2001).

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Whilst progress has been achieved in addressing these issues in developed countries, relatively few studies have addressed the association between SES and health in developing countries. Gender and ageing have been particularly neglected (Smith & Goldman, 2007). Further, in recent years, population ageing has proceeded at a faster pace in developing countries than in the developed world (UNFPA & HelpAge, 2012). Almost two-thirds of world's older population now live in developing countries and this proportion is expected to rise to 80 per cent by 2050 (UNDESA, 2015). In the developing world, Bangladesh and India are two overpopulated neighbouring countries in South Asia which have recently experienced demographic and epidemiological transitions. The proportion of older people in the Bangladesh population was almost 7.5 per cent in 2010 (HelpAge, 2013) and is projected to rise by 22 per cent to reach almost 20 million by 2050 (UNDESA, 2012). In India, the number of older people in 2008 was almost 10 per cent (around 100 million) of the total population and was projected to increase to almost double this figure (198 million) by 2030 (Bhatt, Gadhvi, Sonaliya, Solanki & Nayak, 2011; Ministry of Social Justice &Empowerment, 2008). These changes in the growth and characteristics of ageing populations are the outcome of complex demographic transitions impacted by socioeconomic and environmental changes (Higo & Khan, 2015; Khan, 2006).

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The success of targeted public health interventions; and changes in lifestyles alongside rural to urban migration, have increased the vulnerability of older people who have been observed to be less likely to capitalise on these changes than younger people (Ahmed, Tomson, Petzold &

Kabir, 2005). Given that health has been identified as one of the single most important determinants of wellbeing for older people, bridging this knowledge gap is an important policy concern for both Bangladesh and India. However, a scarcity of data on health of older people living in these countries has limited research on this important age group.

This study sought to examine socio-economic inequalities in health among older adults through a comparative cross-sectional study using data from WHO-INDEPTH SAGE wave 1-2006, Matlab, Bangladesh and Vadu, India. Both countries share an almost similar historical background, and comparable socio-demographic profiles of the elderly population (Table 1). The study selected two settings: those from two remote rural sub-districts of each country to facilitate a comparison in order to identify important variables and to verify the commonality of effects.

TABLE 1 ABOUT HERE

This paper reports on the methods used and provides details of the data sources, the selection and measures of variables. It also provides an overview of the statistical analyses used in the study. We then report on the findings, starting with a brief description of the study sample and then an illustration of the output achieved through bivariate and multivariate analysis. The paper concludes with a summary and discussion of the results and the limitations of the study.

Data and Methods

This study utilised the Matlab, Bangladesh and Pune district India datasets collected in 2007 from the "Study on Global Ageing and Adult Health (SAGE) International Network for the Demographic Evaluation of Population and Their Health" (INDEPTH). This was conducted by the World Health Organization (WHO) in eight developing countries in Asia and Africa. A description of the settings used in this study and the data collection procedure have been discussed in detail elsewhere (Razzaque, Nahar, Khanam & Streatfield, 2010; Hirve, Juvekar, Lele, & Agarwal, 2010). In brief, Matlab is a rural Upazilla under the Chandpur District in Bangladesh. The International Centre for Diarrheal Diseases Research, Bangladesh (ICDDR,B) has maintained a fieldwork station in Matlab since 1963. Using the SAGE short version questionnaire, a sample of 4004 people aged 50 and over was randomly selected from the Matlab Health and Demographic

Surveillance System (HDSS) database of 31,400 people. The data was collected through face-to-face interviews by a team of college graduates who received extensive training on data collection alongside previous experience. The dataset in India was collected from the Vadu HDSS site, Pune district in Maharashtra. This HDSS site consisted of some 80,000 people spread over 22 villages. The data was also collected by field-based trained graduates from a sample of randomly selected 6000 individuals aged 50 and over using the SAGE short version questionnaire. Ethical approval for the use of the data for this study for both HDSS sites was granted by the WHO INDEPTH SAGE data authority. Informed consent was sought from each individual prior to the collection of original data.

Description of Variables

The list of dependent and independent variables used in this study can be seen in Table 1. There are four dependent variables based on health indicators: self-rated health; health state; quality of life; disability or functional ability and five independent variables based on the survey data for both countries: respondent's age; sex; marital status; educational attainment and quintiles of assets.

Dependent Variables

Self-rated health: several studies had demonstrated that self-rated health in older people was a valid measure of their health status (Krause &Jay, 1994). This has been identified as a good predictor of morbidity and subsequent mortality (Jylha, 2009). Self-rated health was measured from responses to the following question: 'In general how would you rate your health today? Options: 1 - Very good, 2 - Good, 3 - Moderate, 4 - Bad, 5 - Very bad. The responses were further categorised into three categories: Bad and Very bad=1, Moderate=2, and Good and Very good =3 with a view to an outcome variable of ordinal logistic regression model. Khan and Raeside (2014) applied a similar outcome measure in an ordered logistic regression.

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Health status: this was measured based on the eight self-assessment ratings in various health domains (e.g. affect, cognition, interpersonal activities, mobility, self-care, sleep, pain, and vision). In each domain, respondents were asked to rate their health using the five-point Likert scale (1 to 5) where 1 represented none or least difficulty and 5 represented extreme difficulty. The mean health state score was calculated and then transformed into a 0 to 100 scale where a higher score indicated a better health state.

Quality of life: the WHO quality of life score was calculated based on the self-rating scores (1 to 5 where 1 denoted completely satisfied and 5 denoted not at all satisfied) addressing satisfaction with various health domains such as enough energy for everyday life; enough money to meet needs; satisfied with health; personal satisfaction; able to perform daily activities; personal relationships; living conditions and satisfied with life as a whole. The mean quality of life score was calculated, and then transformed into a 0 to 100 scale where a higher score represented a better quality of life.

Disability or Functional ability: the WHO disability assessment schedule index was measured using 12 self-assessment ratings on the functional limitations of various health domains. Respondents were asked to rate the level of difficulty they experienced in five categories, 1 to 5 (where 1 represented none or least difficulty and 5 indicated severe or extreme difficulty) in various health domains. The mean disability score was calculated using the scores of different health domains and was then transformed into a new 0 to 100 scale where a higher score represented a high functional ability or a low degree of disability.

Independent variables

Previous research shows that the health status of older adults declines with increasing age (Ahmed et al, 2005). In order to examine whether socio-economic inequalities in the health of older adults reduced or increased with age, this study categorised the age variable into four groups (50-59, 60-69, 70-79, and 80+ years). The age distribution of the respondents in India and Bangladesh indicated that the population of the former was comparatively more aged than the latter. The sample from India was biased towards male participants whereas in Bangladesh, the proportion of male and female respondents was almost the same. The marital status variable was divided into two categories, either, currently married or single. The educational attainment variable was measured based on the years of schooling completed, that is, no schooling, less than or equal to 5 years of schooling, and 6 years or more. The asset quintiles were calculated based on the number of consumer items utilised (e.g. radio, television, a wristwatch etc.), dwelling characteristics (e.g. construction materials used in the wall and roof), access to an available toilet and drinking water facilities. The first to fifth quintile was considered as ranging from poorest to richest in this study. For both countries, education and asset quintiles were used as indicators of socio-economic status

with older adults in India showing better socio-economic status when compared to those in Bangladesh.

Statistical Analysis

The study involved both bivariate and multivariate analysis methods in order to explore the association between socio-economic status and health indicators in the two named rural sub-districts in Bangladesh and India. The percentage of people with very good or good or moderate health was calculated by age for both sites, and two-sample proportion test was performed to examine the significance of differences in proportion between Matlab and Vadu. The mean scores for health state, quality of life and disability level were also calculated by age, and two sample t-tests were performed to identify the differences in health indicators between the sites. Both unadjusted and adjusted ordered logistic regression techniques were performed for the ordered outcome variable self-rated health. Unadjusted and adjusted linear regression analyses were undertaken for the dependent variables with a continuous score (health state score, disability level and quality of life score). The analysis was used in STATA/SE 14.0 (StataCorp LP, College Station, Texas, USA).

Results

Table 2 shows the measurements and percentage distribution of the key characteristics of the respondents both in Matlab, Bangladesh and Vadu, India. It reveals that the proportion of people in the advanced age groups in Vadu was moderately higher than those in Matlab, and that this was consistent with the country-level proportion of ageing population in Bangladesh and India. The sample from Vadu HDSS site was moderately biased towards males (52.08%) compared to an almost equal proportion of males and females in the sample from Matlab HDSS site. In terms of education, the majority of older adults (56.37%) in Matlab did not have any formal education compared to only 5.74 per cent in Vadu. More than two thirds of older people in India had less than, or equivalent to, five years of education, and almost one fourth had more than five years of education. More than three quarters of older adults in both sites were currently living with a partner. With regard to wealth status, proportion of older adults in the poorest quintile was 15.26 per cent in Matlab compared to 11.39 per cent in Vadu, in contrast, proportion of older adults in the richest quintile was 27.35 per cent and 30.06 per cent respectively. The majority of older adults

in Vadu reported good (52.68%) or very good (3.79%) self-rated health compared to almost one-third of older adults in Matlab that reported good (28.32%) or very good (2.30%) self-rated health. In terms of the mean scores for health state, quality of life and functional ability, the health status of older adults in Vadu HDSS site was better than those of in Matlab HDSS site. Specifically, the mean scores of health state, quality of life and functional ability of older adults were 59.31, 64.61 and 66.48 in Matlab compared to 67.03, 74.75 and 76.68 in Vadu respectively.

PLACE TABLE 2 ABOUT HERE

Table 3 represents the comparative distribution of health indicators (self-rated health, health state, and quality of life and disability level) by age for Matlab and Vadu sites. It is evident that irrespective of age, the health of older adults in Vadu was significantly better compared to those living in Matlab for all four health indicators. However, their health deteriorated with an increase in age in both sites but the rate of decline was sharper amongst the older adults in Matlab compared to those in the Vadu sites. The proportion of older people who had very good, good or moderate self-rated health declined from 80.7 per cent for the age group 50-59 to 40.1 per cent for the aged 80 and over. In contrast, this proportion declined from 97.0 per cent for the age group 50-59 to 95.7 for those aged 80 and over. In terms of other health indicators, the mean score of health, quality of life and functional disability was significantly lower amongst older adults in Matlab (59.3, 64.6 and 66.5 respectively; $p<0.000$), compared to the mean score of those indicators in Vadu (67.0, 74.7 and 76.7 respectively; $p<0.000$).

PLACE TABLE 3 ABOUT HERE

Table 4 shows that the results of ordinal logistic regression analysis (both unadjusted and adjusted) for reporting better (good/very good) overall general self-rated health. In the unadjusted model, all the variables were significantly associated with reporting better health in Matlab as they were in Vadu except for some asset quintiles. However, in the adjusted model, marital status and education (more than 5 years) were not found to be significantly associated in the Matlab sample. This might be partly due to highly skewed distribution of sex variable in terms of marital status and education. Whereas in Vadu, all the categories of asset quintiles and educational levels were

not significantly associated with reporting better self-reported health. Specifically, the likelihood of reporting better health declined with age in both sites. Individuals aged 80 years and over in both Matlab and Vadu were 81 per cent and 40 per cent less likely to report better health respectively and the other variables remained constant. Women in the Matlab site were 55 per cent less likely than their male counterpart to report better self-rated health; whereas, in the Vadu site, women were 20 per cent less likely than their male counterparts to report better self-related health. In terms of the SES indicators; compared to the richest quintile, individuals of other quintiles were significantly less likely to report better health in the Matlab sample. In contrast, only individual of poorest quintile in Vadu were less likely than those of the richest quintile to report better health. Further, older adults with no formal education were 54 per cent less likely than those who had more than five years of education to report better health, whereas, in Vadu, this percentage was 27 per cent.

TABLE 4 ABOUT HERE

Tables 5 and 6 present the results of both unadjusted and adjusted linear regression in order to assess association of socio-economic and demographic characteristics with health state, quality of life and functional ability in Matlab, Bangladesh and Vaudi, India respectively. These revealed that most of the variables were strongly associated with the score of health indicators in the unadjusted model. After controlling all other variables in the adjusted regression model, the score of health indicators sharply declined with increases in age in both sites. For those aged 80 and over, the scores for health state declined by 8.85 and 3.67, for quality of life by 5.14 and 0.60, and for functional ability declined by 25.7 and 5.34 per unit change in age compared to those in the age group 50-59 years in Matlab and Vadu respectively. Similarly, the score for health state and functional ability declined by 7.04 and 20.10 in Bangladesh and 1.54 and 5.34 in India per unit change for females as compared to males. However, the quality of life score was significantly associated with the gender of the respondents in the Matlab site but this was not significantly associated with gender in the Vadue site. The marital status of the respondents was significantly associated with the scores of the health indicators in both sites. An exception was in the quality of life score in Matlab where it declined by 6.51 per unit change among single respondents compared with currently married respondents.

In terms of SES indicators, both education and asset quintiles were strongly significantly associated with the health indicator score for older adults in Matlab. In contrast, in the Vadu site education was not strongly associated with the health indicator, and asset quintiles where there was functional disability. There was significance in all other cases. In the adjusted model, the score of the health state, quality of life and functional ability for the older adult in Matlab who had no formal education declined by 1.28, 1.56 and 4.48 respectively per unit change as compared to those who had more than five years of education, In Vadu however, the scores were declined by 2.92, 0.19, and 3.15 per unit change respectively. Inequalities in health outcome in terms of the health indicators between older adults in the poorest and the richest quintile were wider in Matlab compared to the same in the Vadu site. More specifically, the score of health state, quality of life, and functional disability for individuals in the poorest quintile in Matlab were declined by 1.08, 4.65, and 2.53 per unit change respectively compared to those of the richest quintile. In contrast, these were 0.97, 0.66, and 0.20 respectively.

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Discussion

Given the rapid pace of ageing along with increased rates of chronic diseases among the elderly populations in both Bangladesh and India over recent years, the health of older people has and will become a topic of important public health concern (Ahmed et al, 2005). Health care services in both countries have not been focused on improving the health and quality of life within this cohort despite the significant increase in their life span over the last few decades in both countries. This also includes a trend towards decreased mortality (Ahmed et al., 2005). Little is known about the general health as life expectancy increases (Tareque et al., 2014; Roy & Chaudhuri, 2008). Traditionally, older people in both Bangladesh and India have received the majority of care and other support from their family or close relatives, and particularly from their sons or daughters. More recent breakdown in these traditions, however, has been attributed to rapid socio-economic changes and demographic transitions (Khan, 2014, Kabir et al., 2013; Verma and Khanna, 2013)). As a consequence, the health and quality of life of older people may be impacted by these changes in traditional care and support and merits further attention within both policy and the organisation and practices of care and support services. The linking of socio-economic and demographic factors

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with the health of older adults in both these countries also requires further scrutiny given the scarcity of research and the availability and utility of high quality data.

This study compared and examined socio-economic and demographic correlates of health indicators using high quality cross-sectional data from the INDEPTH WHO-SAGE study on Matlab Bangladesh and Vadu, India. Undertaking a cross-country comparison of these two neighbouring countries has facilitated the identifying and comparability of some of the risk factors to health given that the healthcare systems for the elderly populations in both countries have very similar properties and infrastructure. The evidence reviewed here has identified that health differentials in Bangladesh and India may be attributed not only to a lack of access to healthcare facilities but may also originate from inequalities in the social determinants of health.

This study found that general health of older adults was better for the older adults in Vadu, India compared to those in living in Matlab, Bangladesh and that this was the case for all four health indicators. This might be partly due to better socio-economic status in terms of education and asset quintiles in India than in Bangladesh, and is consistent with the findings of numerous studies which demonstrate that people of a higher SES generally experience better health compared to those of a lower SES (Hosseinpoor et al., 2013). Age was found to be significantly associated with health outcomes in both countries and all the health indicators sharply deteriorated with increased age. This result concurs with other empirical evidence regarding the psychological processes of human ageing linked to ill health and disease (Kirkwood, 2014). Gender differences in terms of all indicators were wider in the Bangladesh site than in the Indian site. Older females in all age groups were more likely to report poorer health than their male counterparts with females in the oldest age group (80 and over) in Bangladesh experiencing the very worst health. This result was in line with the findings of Tareque et al. (2013) which revealed that females in Bangladesh experienced more functional limitations in old age compared to their male counterparts. Unlike quality of life, older females in Vadu consistently showed a poorer self-reported health and lower score of health states and functional ability than their male counterparts. This result was consistent with a recent study by Bora and Saikia (2015) which revealed that poorer self-reported health and disability was significantly higher among Indian adult females than among their male counterparts. Ahmed et al (2005) in a study of Bangladesh found that whilst there was no significant difference

in health seeking behaviour between younger and older people, the socioeconomic status of the household was the single most pervasive determinant on health seeking behaviour. These override both age and gender and regardless of the type of person from whom they sought help.

One of the key objectives of this study was to contribute to ongoing debates on socio-economic differentials in health outcomes. This study found that socio-economic indicators (education and asset quintiles) were consistently associated with all four health indicators even after controlling the socio-demographic variables in the regression model in Bangladesh. The findings were consistent with the findings of studies conducted in other developing countries (Hosseinpoor et al., 2013; Smith & Goldman, 2007) and in Bangladesh (Hurt et al, 2004). On the other hand, in Vadu, after controlling the socio-demographic variables, education was not significantly associated with self-reported health and quality of life. Compared to those with more than five years education, older adults with no formal education had a significantly lower score for health state and functional ability. Likewise, the asset quintile was significantly associated with health state and a quality of life score but not consistently associated with self-rated health and functional ability. Overall, SES indicators were not consistently associated with health indicators (except the health state score) of older adults in Vadu.

This study had a few limitations. Firstly, the data used was cross-sectional and health indicators were measured by self-reporting, which impeded an interpretation of a causal relationship between SES and health. We could not draw any inferences concerning a causal association between SES and health using time trend data and age effects could not be separated from cohort effects while using cross-sectional design. Secondly, the samples were not nationally representative as the data was collected from two rural sub-districts in Bangladesh and India. Considering the large social, economic, cultural and ethnic diversity of India and Bangladesh, the results of this comparative study failed to draw insights of SES differentials in health outcome at a national level. Furthermore, the data did not include some important SES indicators such as income and occupation as well as health related life-style factors. This study could therefore not perform a comprehensive analysis on the full range of social inequalities known to impact on health. Subsequent studies will hopefully address these factors.

Despite these limitations, as an initial and iterative study comparing SES differentials in health outcomes among older adults of two-sub districts in Bangladesh and India, the findings have

highlighted the importance of understanding social inequalities in health in developing countries, and in particular, the South Asian region. As the proportion of older people in this region rapidly grows, there is an imperative for further investigations into the links between SES and health and their related gender differences. The interaction of increasing impactful globalisation with transformation over time in the life course as illustrated in the rapid demography within these two countries, suggests that a widening of inequalities is impacting both within and between these different countries. It suggests an important research agenda in terms of assessing how these factors will influence the quality of life in old age and the need to address a growing chasm that is likely to persist and even grow into the future. The interventions and policies required to address inequalities associated with ageing are likely to be complex. In formulating national policies and programmes particularly around health interventions, more systemic assessments are needed that draw on the relevant benchmarks reviewed here in order to target more effectively across these diverse contexts. Addressing issues of equality across the life course is also essential to harness potential for increased economic, educational and wellbeing for both genders created by the trend towards longer lifespan.

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Table 1. Demographic characteristics of Bangladesh and India

Demographic characteristics	Bangladesh	India
Total population	156 million	1,267 million
Sex ratio	0.97 males/female	1.08 males/female
Population density	1237/sq. km	441/sq. km
Urban population	32.7%	34.3%
Infant mortality rate (per 1000)	32.9	40.5
Total fertility rate	2.19	2.45
Life expectancy (at birth)	73.2 years (male 71 and female 75.4)	68.5 years (male 67.3 and female 69.8)

Source: The world fact book, Central Intelligence Agency, 2016

Table 2. Socio-economic and health profile of older adults of Matlab, Bangladesh and Vadu, India aged 50 and over

Variables	Classification and measurement	Matlab		Vadu		P-value
		Cases (n=4004)	Percentages	Cases (n=4514)	Percentages	
Age group						
	50-59=1	1812	45.25	1768	39.17	
	60-69=2	1379	33.79	1691	37.46	P<0.000
	70-79=3	687	17.16	828	18.34	
	80 and over=4	152	3.80	227	5.03	
Sex						
	Male=1	1999	49.93	2351	52.08	
	Female=2	2005	50.07	2163	47.92	P=0.05
Education						
	No formal=0	2257	56.37	259	5.74	
	<= 5 years =1	1149	28.70	3221	71.36	P<0.000
	> 5 years =2	598	14.94	1034	22.91	
Asset quintiles						
	Poorest=1	611	15.26	514	11.39	P<0.000
	Poorer=2	667	16.66	686	15.20	
	Middle=3	701	17.51	994	22.02	
	Richer=4	930	23.23	963	21.33	
	Richest=5	1095	27.30	1357	30.06	
Marital status						
	In partnership=1	3049	76.15	3595	79.64	P<0.000
	Now single**=2	955	23.85	919	21.36	
Self-rated health						
	Very good=1	92	2.30	171	3.79	
	Good=2	1134	28.32	2,378	52.68	P<0.000
	Moderate=3	1598	39.91	1772	39.26	
	Bad=4	1009	25.20	187	4.14	
	Very bad=5	171	4.27	6	0.13	
Health state	0 to 100 score	Mean	59.31		67.03	P*<0.000
		Standard error	0.14		0.15	
Quality of life	0 to 100 score	Mean	64.61		74.74	P*<0.000
		Standard error	0.13		0.07	
Functional ability	0 to 100 score	Mean	66.48		76.68	P*<0.000
		Standard error	0.34		0.21	

P value is of Chi-square test & P* value is of t-test, ** Now single include widow, divorced and others

Table 3. Distribution of health indicators by age and study sites Matlab, Bangladesh, and Vadu, India datasets

Health indicator	Matlab, Bangladesh	Vadu, India	P-value
Self-rated health (% of very good or good or moderate)			
50-59	80.7	97.0	P<0.000
60-69	68.7	95.9	P<0.000
70-79	54.0	93.9	P<0.000
80 and over	40.1	90.7	P<0.000
All age groups	70.5	95.7	P<0.000
Mean health status			
50-59	61.6	68.5	P<0.000
60-79	58.7	66.9	P<0.000
70-79	55.6	64.9	P<0.000
80 and over	53.7	64.2	P<0.000
All age groups	59.3	67.0	P<0.000
Mean quality of life			
50-59	66.9	75.2	P<0.000
60-69	63.8	74.8	P<0.000
70-79	61.2	74.1	P<0.000
80 and over	60.3	74.2	P<0.000
All age groups	64.6	74.7	P<0.000
Mean functional ability			
50-59	72.7	78.4	P<0.000
60-69	64.9	76.8	P<0.000
70-79	56.7	73.9	P<0.000
80 and over	49.7	72.4	P<0.000
All age groups	66.5	76.7	P<0.000

Table 4. Ordered logistic regression models on reporting (very good or good or moderate) overall general self-rated health in Matlab, Bangladesh and Vadu, India

Independent variables	Bangladesh				India			
	Unadjusted model		Adjusted model		Unadjusted model		Adjusted model	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Age								
50-59	1.00		1.00		1.00		1.00	
60-69	0.58**	0.51-0.66	0.57**	0.50-0.66	0.84**	0.73-0.96	0.89	0.78-1.02
70-79	0.33**	0.27-0.39	0.31**	0.26-0.37	0.75**	0.63-0.88	0.81*	0.68-0.97
80 and over	0.19**	0.14-0.27	0.16**	0.11-0.22	0.53**	0.40-0.69	0.60**	0.45-0.79
Sex								
Male	1.00		1.00		1.00		1.00	
Female	0.47**	0.41-0.53	0.45	0.39-0.52	0.70**	0.62-0.79	0.80**	0.70-0.91
Marital status								
In partnership	1.00		1.00		1.00		1.00	
Single	0.46**	0.40-0.53	1.01	0.85-1.19	0.68**	0.59-0.79	0.83*	0.71-0.96
Education								
> 5 years	1.00		1.00		1.00		1.00	
No formal	0.46**	0.39-0.54	0.82*	0.68-0.99	0.73*	0.55-0.96	0.94	0.70-1.24
<= 5 years	0.63**	0.52-0.76	0.87	0.72- 1.05	0.59**	0.51-0.69	0.71**	0.61-0.83
Asset quintiles								
Richest	1.00		1.00		1.00		1.00	
Poorest	0.68**	0.57-0.82	0.74**	0.61-0.90	0.71**	0.58-0.87	0.76**	0.62- 0.93
Poorer	0.73**	0.61-0.87	0.72**	0.60- 0.87	0.99	0.82-1.19	1.01	0.84-1.21
Middle	0.74**	0.62-0.88	0.73**	0.61- 0.88	0.89	0.75-1.04	0.91	0.77- 1.06
Richer	0.85*	0.72-1.00	0.87	0.73-1.02	1.17	1.00-1.38	1.19	1.01-1.41

Note: ** p<0.001, * p<0.05

Table 5. Results of linear regression models (both unadjusted and adjusted) on health state, quality of life and functional ability score in Matlab, Bangladesh

Independent Variables	Health state		Quality of life		Functional ability	
	Unadjusted model β (se)	Adjusted model β (se)	Unadjusted model β (se)	Adjusted model β (se)	Unadjusted model β (se)	Adjusted model β (se)
Age						
50-59	0.00	0.00	0.00	0.00	0.00	0.00
60-69	-2.92 (0.31)**	-2.82 (0.28)**	-3.10 (0.29)**	-2.04 (0.25)**	-7.80 (0.74)**	-7.5 (0.65)**
70-79	-6.05 (0.37)**	-6.23 (0.36)**	-5.72 (0.36)**	-3.87 (0.32)**	-16.02 (0.93)**	-16.5 (0.83)**
80 and over	-7.89 (0.72)**	-8.85 (0.67)**	-6.59 (0.68)**	-5.14 (0.58)**	23.03 (1.73)**	-25.7 (1.53)**
Sex						
Male	0.00	0.00	0.00	0.00	0.00	0.00
Female	-0.716 (0.26)**	-7.04 (0.30)**	-5.99 (0.24)**	-2.95 (0.26)**	-20.46 (0.61)**	-20.1 (0.68)**
Marital status						
In partnership	0.00	0.00	0.00	0.00	0.00	0.00
Single	-5.94 (0.32)**	-0.04 (0.35)	-9.98 (0.26)**	-6.51 (0.30)**	-16.56 (0.76)**	0.11 (0.80)
Education						
> 5 years	0.00	0.00	0.00	0.00	0.00	0.00
No formal	-5.76 (0.40)**	-1.28 (0.40)**	-6.41 (0.37)**	-1.56 (0.34)**	-16.80 (0.97)**	-4.48 (0.90)**
<= 5 years	-3.31 (0.44)**	-080 (0.40)*	-3.01 (0.41)**	-0.77 (0.35)*	-9.74 (1.05)**	2.82 (0.91)**
Asset quintiles						
Richest	0.00	0.00	0.00	0.00	0.00	0.00
Poorest	-1.19 (0.45)**	-1.08 (0.41)**	-6.44(0.41)**	-4.65 (0.36)**	-5.05 (1.10)**	-2.53 (0.93)**
Poorer	-1.55 (0.44)**	-1.36 (0.38)**	-4.45 (0.39)**	-3.64 (0.34)**	-2.87 (1.07)**	-2.18 (0.88)**
Middle	-1.11(0.43)**	-0.93(0.0.38)*	-3.07 (0.39)**	-2.27 (0.33)**	-2.17 ((1.06)*	-1.59 (0.87)
Richer	-0.87 (0.40)*	-0.59(0.34)	-2.08 (0.36)**	-1.56 (0.30)**	-1.71 (0.96)	-0.83 (79)

Note: * *p<0.001, * p<0.05

Table 6. Results of linear regression models (both unadjusted and adjusted) on health state, quality of life and functional ability score in Vadu, India.

Independent Variables	Health state		Quality of life		Functional ability	
	Unadjusted model β (se)	Adjusted model β (se)	Unadjusted model β (se)	Adjusted model β (se)	Unadjusted model β (se)	Adjusted model β (se)
Age						
50-59	0.00	0.00	0.00	0.00	0.00	0.00
60-69	-1.56 (0.33)**	-1.22 (0.33)**	-0.29 (0.16)	-0.17 (0.16)	-1.63 (0.47)**	-1.26 (0.47)*
70-79	-3.54 (0.41)**	-3.12 (0.42)**	-1.01 (0.20)**	-0.80 (0.21)**	-4.45 (0.58)**	-4.07 (0.59)**
80 and over	-4.27 (0.69)**	-3.67 (0.71)**	-0.89 (0.33)*	-0.60 (0.34)	-6.01 (0.97)**	-5.34 (0.99)**
Sex						
Male	0.00	0.00	0.00	0.00	0.00	0.0
Female	-2.21 (0.29)**	-1.54 (0.32)**	-0.24 (0.14)	0.03 (0.16)	-2.81 (0.41)**	-2.14 (0.45)**
Marital status						
In partnership	0.00	0.00	0.00	0.00	0.00	0.00
Single	-2.15 (0.36)**	-0.38 (0.39)	-0.59 (0.18)**	-0.35 (0.19)	-2.58 (0.51)**	-0.41 (0.55)
Education						
> 5 years	0.00	0.00	0.00	0.00	0.00	0.00
No formal	-4.38 (0.68)**	-2.92 (0.70)**	-0.49 (0.33)	-0.19 (0.34)	-4.95 (0.85)**	-3.15 (0.45)**
<= 5 years	-3.6 (0.35)**	-2.0(0.38)	-0.90 (0.17)	-0.70(0.18)**	-3.94 (0.49)**	-2.2(0.53)
Asset quintiles						
5th quintile	0.00	0.00	0.00	0.00	0.00	0.00
1st quintile	-1.57 (0.51)**	-0.97 (0.51)*	-0.81 (0.24)**	-0.66 (0.25)**	-0.51 (0.72)	0.20 (0.71)
2nd quintile	-1.54(0.46)**	-1.37 (0.45)**	-0.54 (0.22)*	-0.47 (0.22)*	-2.23 (0.65)**	-2.06 (0.64)
3rd quintile	-1.13 (0.41)**	0.98 (0.41)*	-0.40 (0.26)*	-0.35(0.19)	-1.25 (0.57)*	-1.09 (0.57)
4th quintile	0.30 (0.42)	0.44 (0.51)	-0.20 (0.25)	-0.16(0.25)*	-0.43 (0.58)	-0.26 (0.57)

Note: * *p<0.001, * p<0.05