# Socioeconomic Differentials in Mortality among the Oldest Old in China

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## Abstract

Although an inverse relationship between socioeconomic status (SES) and mortality has been documented for many populations throughout the world, whether this relationship holds true for the oldest old has been questioned. Most notably, some scholars have suggested that the relationship may disappear at the oldest ages. Using data from the 1998, 2000, and 2002 waves of "the Chinese Longitudinal Healthy Longevity Survey," this paper examines the relationship between socioeconomic status and mortality among the oldest old (80+) population in China. Our results show the continuing prevalence of SES differentials in mortality--higher SES is significantly associated with lower mortality risks--among the oldest old in China. We further show that the relationship holds regardless of how the oldest-old are operationalized (80+, 90+, or 100+).

# Socioeconomic Differentials in Mortality among the Oldest Old in China

Over the last half century, numerous studies have explored the relationship between mortality and socioeconomic status (SES) (for example, see Bassuk et al. 2002; Shkolnikov et al. 1998; Kitagawa and Hauser 1973). In one of the earliest studies, Moriyama and Guralnick (1956) examined occupational differentials in mortality in the U.S. and found substantial differences between laborer and non-laborer occupations (see a review by Moore and Heyward 1990). Since that seminal study, researchers have extended the depth and scope of their inquiry by incorporating multiple SES measures and by examining mortality patterns across nations. Kitagawa and Hauser (1973), for example, considered mortality differentials by both educational and income levels, relying upon the 1960 matched census-death certificate data. In the early 1980's, the Black Report examined occupational differentials in health and mortality in England (Black et al. 1982). A prevailing view has emerged from these studies: there is an inverse relationship between SES and mortality.

Despite the near unanimity of these findings, two qualifications of the prevailing view have been raised. First, the causal nature of this relationship is less than clear. While prior factors such as a pre-existing medical condition could be linked to low SES outcomes as well as to heightened mortality risks, most researchers agree that the relationship between SES and mortality is primarily causal (Goldman 2001), suggesting that improvement in SES leads to reduced mortality risks. Second, the strength of this relationship may vary across populations and social contexts. In particular, whether this relationship holds true for the elderly population has been questioned. This paper focuses on the latter concern, and considers the extent to which the prevailing SES/mortality relationship holds for the oldest-old population in China. Although many have documented the strong, inverse relationship between SES and mortality on the adult population (see for example, Moriyama & Guralnick 1956), studies that focus on the elderly population (65 and older) have produced far less consistent results. In particular, the oldest old population is not adequately addressed.

Two primary hypotheses have been advanced to explain the age effect on the relationship between SES and mortality and health--the cumulative advantage and convergence hypotheses. The cumulative advantage hypothesis predicts that the effect of SES grows larger with age. According to Ross and Wu (1996), SES differentials may even be larger among the elderly than among adults. In their words, "educational attainment increases resources that accumulate throughout life, producing a larger SES gap in health among older persons than younger" (Rose and Wu 1996:105). However, except for their study, the current literature does not offer much evidence to substantiate this hypothesis.

In contrast, the convergence hypothesis states that the effect of SES begins small in early adulthood, expands in middle ages, and then narrows in old ages (Robert & House 2000). This perspective predicts the magnitude of this relationship at very old ages to be minimal or non-existent (House et al. 1990). A number of possible facts might explain such a relationship. First, the oldest-old elderly are clearly detached from economic activities and thus immune to some causal mechanisms through which SES affects mortality, such as job hazards and work stress. Second, biological determinants, rather than social determinants, should take on a predominant role in affecting mortality for this age group. Thus, a higher SES cannot reduce mortality as much as it does in younger ages. Third, the diminished or non-existent SES differentials in older ages may reflect the fact that less healthy people die prior to certain old ages (House et al. 1994). In other words, those who survive to a very old age are already selected with respect to unobserved health traits that should compensate for the SES effects on health in earlier ages. Fourth, the exposure to risk factors regarding health behavior such as smoking and drinking is reduced among the elderly (House et al. 1994). Finally, in developed countries such as the U.S., social welfare policies reduce SES inequalities among the elderly.

In support of the second perspective, many studies have found evidence suggesting that the effect of SES on the mortality of the elderly is smaller in comparison with younger groups (25-64) (Huisman et al. 2003; House et al. 1990; 1994; Kitagawa & Hauser 1973). For example, House et al. (1990, 1994) found that SES differentials in health inequality are smaller at later old ages (75 and older), compared to middle ages (35-65) and early old ages (65-75).

Our paper begins from the perspective that while many studies have been conducted to test the relationship between SES and mortality among the elderly, they do not adequately address the oldest-old population. Therefore, based on current research, we are left to ponder whether there are significant effects of SES on mortality among the oldest old, and particularly those at very old ages (100+), whether SES still affects mortality and health. Previous studies that found smaller SES differentials among the elderly have provided the basis for our study on the oldest old. If it is true that SES differentials get smaller and smaller with age, we would expect that they may eventually disappear.

In fact, to our knowledge, researchers have not paid adequate attention to the oldest old (say 80 and older), especially the extremely old (100 and older), due to a lack of sufficient data. Most studies to date do not differentiate the oldest-old from the younger old. However, this distinction is important, because the younger old and the oldest old are different in some significant respects. As Huisman et al. (2003) point out, for example, the younger old are recently retired and some of them still engage in economic activities while the oldest old usually have been detached from economic activities for more than 15 or 20 years.

In light of current demographic trends of postponed mortality and prolonged longevity, moreover, understanding the impact of SES on mortality for the oldest-old population becomes increasingly important as the total number of individuals in this age group begins to expand. For example, there were 8 million oldest old (80 and older) in 1990 in China; however, this number will be 114 million in 2050 based on the modest mortality assumption (Zeng and Vaupel 1989). The oldest old population are those who need the most care, whether from family or from society. Moreover, most deaths occur in the oldest old ages. Therefore, reducing the mortality among the oldest old leads to the decline of general mortality.

The relationship between SES and mortality is of direct interest in both developed and developing countries so that specific policies may be devised to reduce inequalities in health caused by SES differentials among the older population. As discussed above, current literature on social stratification of health and aging states that SES differentials in health are greater in middle and early old ages, and smaller in late old ages. If this statement is true, it is likely that reducing SES differentials in late old ages cannot reduce their inequalities in health.

In addition, the studies discussed above focus only on developed countries, and may not be applicable to those from developing countries such as China, especially for the oldest old, due to different socioeconomic and cultural backgrounds. In China, the elderly are not well educated, with more than 60% of them illiterate (Liang et al. 2000). There are no well-established social welfare programs such as social support systems for the elderly that are comparable with those in developed countries. Instead, family support is widely used, providing the elderly not only with financial resources but also emotional support. China is developing its market economy, but the traditional planned economy remains in some sectors. For historical reasons, the development in rural areas is far behind that of urban areas, further deepening an already sharp divide between rural and urban areas. These factors make social stratification in China more complex when compared with that in developed countries.

In brief, the purpose of our study is to test whether SES differentials in mortality exist among the oldest old Chinese. Correspondingly, our research questions are: For the oldest-old people, does SES still affect mortality significantly? More specifically: Do SES differentials with respect to mortality disappear beyond a particular old age (e.g. 80, 90, or 100)?

## Data and Methods

### Data

A survey of the oldest-old Chinese was conducted in 1998 as a baseline for a longitudinal project on health and longevity. This was a multi-stage, stratified cluster survey. The survey achieved roughly equal numbers of respondents in each age group (80-89, 90-99, and 100 and older) by oversampling extremely old persons (i.e. 100 and older) and male oldest-old persons (Zeng et al. 2000). The survey was conducted in 631 randomly selected counties and cities of the 22 provinces. The Han ethnic group is the majority among the respondents. Some provinces such as Xinjiang, Qinghai, and Gansu, where a large proportion of ethnic minorities live, were not included in this survey, in order to avoid "potentially inaccurate age-reporting" (Zeng et al 2000). The follow up surveys were conducted in 2000 and 2002 respectively. The baseline (i.e., 1998) survey includes 9,093 people aged 80 and above. A total of 3,362 persons died between the first and second waves, while 1,562 persons died between the second and the third waves. With detailed information on peoples' demographic and socioeconomic status variables, we are able to analyze the relationship between SES and mortality among people at the oldest ages.

Since age may be misreported for respondents who reported to be extremely old, we only consider respondents who were younger than 105 in the base year of 1998. After excluding invalid or incomplete statistics, the baseline survey includes 7,390 people between ages 80 and 105. In total, 4,827 people died between the baseline and 2002 surveys.

**Measures**

In this analysis, mortality from all causes is the dependent variable. Deaths between the baseline survey and the follow-up survey as well as the time of death were recorded by interviewers. The information was given by the appropriate proxy respondent, usually the next of kin. The deaths were verified by family members or neighbors. This method is more accurate than checking household registration records because these records are not updated regularly.

The socioeconomic predictor is a composite of education and urbanity at the baseline. In most previous studies, education, income, and occupation have been used as important indicators in predicting mortality and health status (House et al., 1990; House et al., 1994; Bassuk et al., 2002). However, it is not clear that measures suitable for establishing SES in developed countries are equally suitable for developing countries. According to Zimmer et al. (1998), in developing countries, information about education level is more easily accessible and constitutes a more valid indicator of SES than income or occupation because older people may have more than one financial resource, and many of them have retired and may have held multiple jobs in the past (Zimmer et al., 1998). Given that the study subjects were the oldest-old people in China with almost of all of them no longer in the labor force, occupation is not a good measure of SES, although it usually works well for employed populations (Robert & House 2000). In addition, income is not available in this data set. Income would not be a good measure in any event because the oldest old rely on multiple financial, as well as material, resources, especially family support. While we do not use income and occupation as SES indicators, education is still an important SES measure. Previous studies have shown that education is a strong predictor of a person's SES (Blau and Duncan 1967; Hauser and Warren 1997). In China, education has some additional importance. For instance, education can change one's household registration status from rural to urban, and consequently, it is a basis for class mobility (Wu and Treiman 2004). In this study, education is defined as a dummy variable, non-educated versus educated.

Urban versus rural residence presents another important dimension of SES in China. It is defined as a dummy variable, measuring whether respondents live in rural areas or urban areas. Large disparities exist between urban and rural areas in China. Since the establishment of the household registration system in 1955, the Chinese population has been divided into agricultural (rural) and nonagricultural (urban) sectors. This system limits the migration from rural to urban areas. In fact, as Wu and Treiman (2004) point out, the household registration system may determine "access to good jobs, education for one's children, housing, health care, and even the right to move to a city" (P. 363). Generally, people who live in rural areas are disadvantaged compared with those who live in urban areas in terms of income, medical resources, etc (Liang et al. 1999).

We create an SES variable with 4 categories composed of various conditions of education and urbanity: (1) non-educated and living in rural areas, (2) non- educated and living in urban areas, (3) educated and living in rural areas, and (4) educated and living in urban areas. Therefore, in the analysis, we divided people into 4 socioeconomic groups based on two dimensions of education and urbanity. In other words, different SES groups cannot be distinguished based on only one variable such as education.

The covariates include age, sex, ethnicity, region, activities of daily living (ADL), and self-reported health. Age and sex are the most important determinants of mortality. Age is a continuous time-varying variable, and sex is a dummy variable (female is coded as 1). In addition, we include in our model a variable "interval", which is a time-varying variable and represents survival time between the two survey times 1998 and 2002. Ethnicity is categorized as Han (coded as 1) or minority (coded as 0). Region is a four-category classification: northern , middle, southern, and western .

ADL and self-reported health at the baseline survey are two important confounding variables for SES in addition to age and sex.  Compared with developed countries, it is hard to measure accurately the health status of old people, especially for the oldest-old people, in developing countries such as China, because medical diagnoses and records are very poor (Zeng et al. 2000). Thus, ADL provides a better indicator of the objective health status of the oldest-old Chinese than the chronic conditions that are often used in previous studies. Self-reported health is another health status indicator, a mixed measure of objective health status and subjective feelings about health (Maddox and Douglass 1973). Previous studies show that self-reported health is a good predictor of mortality and physical functional decline of the elderly (Benyamini et al 1999; Idler and Benyamini 1997). In this study, functional status including eating, dressing, transferring, using the toilet, bathing, and continence is used to generate an ADL variable. ADL status in 1998 is categorized as impaired (coded as 1) or not impaired (codes as 0). Self-reported health measures the oldest old's health status at the time of interview by having respondents answer a question on a 5-point scale ranging from "bad" to "very good," It is categorized as bad (coded as 1) and good or fair (coded as 0) in our analysis.

In this study, we construct three alternative age groups in order to examine whether SES differentials disappear beyond an old age: the entire group (80 and older), and two subsets—90 and older, and 100 and older**.** Correspondingly, the first step in our analysis is to see whether SES affects mortality among the elderly, 80 and older. The start age of 80 may not be old enough; thus, we examine the relationship among the elderly at the start age of 90. In order to determine if a further SES relationship exists, the start age of 100 is examined.

Table 1 displays the basic information on the study population. Overall all, there are more women (64%) than men (36%). The majority is non-educated; i.e., among the oldest old, more than 60% are non-educated. Moreover, as age increases, the proportion of non-educated increases. In addition, more than 60% of the population lives in rural areas. Therefore, the oldest old Chinese are generally not well educated, and most of them are rural residents. From Table 1, we can see that the distribution of deaths indicates that as age increases, mortality increases. Women have lower mortality than men, and educated people have lower mortality than non-educated people. The lowest mortality was for educated people who live in urban areas.

Table 1 about here

**Analysis**

We conduct discrete survival analysis involving time-varying covariates to examine the impact of SES on mortality risk. More specifically, we estimate the effects of SES using logit models. Our analysis involves three steps. First, we estimate the effect of SES on mortality among all ages (i.e. 80 and older). Second, we analyze the effect of

SES on mortality among those aged 90 and older. Third, we focus on the age group 100 and older. For each step, we present two models--one without and one with health status at the baseline as a control variable.

Our analytic strategy has two advantages. First, we do not know at what old age SES differentials in mortality and health begin to converge. Analysis with three alternative target populations (i.e., 80 and older, 90 and older, and 100 and older) sheds new empirical light on this issue. Second, using health status as controls in the mortality analysis enables us to further understand and interpret the relationship between SES and mortality.

## Results

We begin by estimating the effects of SES without controlling for health status. For the oldest old elderly, SES significantly affects mortality not only among those ages 80 and older, but also among 90 and older, and 100 and older, as we can see in Table 2.

Column (1) in Table 2 shows that SES significantly affects mortality for all age groups. The risk of dying for educated elderly living in urban areas is about 24 percent less than the risk for uneducated living in rural areas (odds ratio=0.76). The mortality risk for educated people who live in rural areas is about 8.2 percent lower than that of uneducated living in rural areas (odds ratio=0.918). Additionally, the dying risk for the urban non-educated (.989) does not differ significantly from the reference group, the rural non-educated, though it is less than 1. In summary, the evidence from table 2, does not suggest that SES differentials disappear after 80.

Turning now to the 90 and older sub-population (column 2), we find that the educated living in rural areas have slightly lower odds of dying (odds ratio=.961) than their non-educated counterparts, though the difference is not significant at the .05 level. The urban educated, however, have a 23.3 percent lower mortality risk (i.e. odds ratio= .767) than the rural, non-educated reference group, and the results are significant at the 0.1 level. Akin to the 80+ population, differences between the rural and urban non-educated are neither substantively nor statistically significant (odds ratio=.977). Thus, for the population aged 90 and older, higher SES continues to offer a pronounced protective effect on mortality, compared with the population ages 80 and older.

We now consider the extremely old age groups, i.e., those who are ages 100 and older, a group with perhaps the greatest longevity in the world. Column (3) in table 2 reveals SES effects that are similar to those found for the 90+ population. Differences between the urban and rural non-educated continue to be small and insignificant (odds ratio=.99), and the 1.7% higher risk of dying for the rural educated (odds ratio=1.017), compared to the rural non-educated, is also statistically insignificant. However, the SES premium for the urban educated still exists and it only decrease *a little bit*, from a 23.3% mortality reduction observed for those ages 90 and older to a 22.9% risk reduction (odds ratio=.771) for those 100 and older. In comparison with those ages 80 and older and those ages 90 and older, the SES premium is only significant at 0.05 level.[1]

Table 2 about here

Table 2 also details the effects of sex and age on mortality. As expected, women exhibit lower mortality than men whether at every age group, and mortality increases

[1] Differences in the coefficients across the three samples, however, are not statistically significant for models reported in Tables 2 and 3.

with age. Comparing effects sizes, however, we observe that the differentials in mortality across some SES groups are even larger than the sex differential in the 90+ and 100+ subgroups.

One point worth noting in Table 2 is that *time interval* has significant effects even though time-varying age has already been included in the model. Though we expected that time-varying age would show the effects of the force of mortality over time (mortality increases with age), the *observation time* during the survey period *also* affects the likelihood of dying (mortality increases with observation time, *independent of age*). This finding is unexpected, as it suggests that the mortality risk at every age is *higher* for those from younger cohorts.

This finding is inconsistent with recent studies that would expect lower mortality risk for younger cohorts. To account for this seeming discrepancy, we consider the role of interview selection. At the first wave interview, respondents would probably need some adequate level of health that would allow them to be interviewed with/without family members' help. In other words, the elderly who were particularly sick at the beginning of the study would have likely been excluded from the respondent sample, which would bias the hazard rates for younger cohorts downward in our analyses.

Consider two groups, group A, which *entered* the sample at the age of 84, and group B, which *aged* to 84 by the second wave (i.e., age 82 at baseline). Given the minimal adequate health expectation noted above, members of group A are on average selectively healthier than members of group B at the same age of 84, since really sick persons were included in group B but not in Group A. Therefore, even though the underlying age patterns of health are the same for the two groups, the health status of *observed* members in group A are healthier than that for members in group B. In other words, respondents from both groups should have a sufficiently favorable health status at Wave I in order to be included in the sample. During the next two years, both groups will experience health declines and mortality due to the aging process, and the health of group B individuals *as they age to 84* may in fact fall below the baseline levels of group A individuals (who *started* at 84). Further, since there are no sample selection criteria (i.e. the minimal adequate health expectation) at later waves, members of group B would still be included even if their health declined to levels below what would have been necessary for sample inclusion at wave I. Thus, *at every age* (e.g., 84), respondents who have spent *more* time in the survey have higher mortality than those who have spent less time in the survey, due to this selection process. This finding allows us to observe positive age *and* interval (observation time) effects simultaneously, and further suggests that the actual mortality among the older cohorts in our sample is likely underestimated.

Table 3 about here

Table 3 replicates the models from Table 2, but controls the health status at baseline. We note that SES continues to have a large and significant influence on mortality. Health status at the baseline does not explain away the relationship between SES and mortality, and in some cases, the results from Table 2 actually become more pronounced. Educated people living in urban areas continue to have the lower risk of dying than those without education and living in the countryside, regardless of age group. The effects are particularly striking for the extremely old (100+) among the urban educated, for whom we observe a 28.5% reduction in mortality risk (odds ratio=.715), which is significant at the 0.05 level. This substantial if somewhat unanticipated finding suggests not only that the protective effects of SES may not decline at the oldest ages, but that they may in fact increase after controlling for the baseline health status. For other categories of SES, some minor crossovers exist: compared to those with no education living in rural areas, for example, the urban non-educated have a slightly higher risk of mortality (odds ratio= 1.019) throughout the 90+ age group, and even the rural educated have a slightly higher risk of mortality (odds ratio=1.077) for the 100+ group.

Additionally, both health indicators substantially influence mortality. For those with poor self-rated health in the entire group, the probability of dying is 1.51 times higher than those with good self-rated health. Similarly, people with impaired ADL at the baseline are more likely to die than those without impaired ADL (odds ratio = 1.74). Furthermore, the effects of self-rated health on mortality decrease from 1.51 for 80 and older to 1.40 for 100 and older, and the trend is similar with respect to the effects of ADL. These results reveal that ADL and Self-reported health, especially the former, have profound effects on the mortality of China's elderly population, especially among the oldest age groups. Finally, as the results in Table 2 demonstrate, the interval is still significant, and its effects increase with age.

In short, table 2 and table 3 provide three key insights. First, SES has substantial and significant effects on the mortality of China's oldest old (80+). Second, the effects of SES are large, comparable in magnitude to that of sex, particularly for the extremely old (100+). Third, the SES effects that we document are quite robust, whether we change the target population to the 80+, 90+, or 100+ elderly. These effects persist, or even strengthen, after we control for health status at the baseline.

## Conclusion

This study demonstrates the relationship between SES and mortality among the oldest old Chinese. We show that SES still has significant effects on mortality regardless of whether we operationalize the oldest-old as those 80 years and older, 90 years and older, or 100 years and older. We found that higher SES reduces the risk of mortality among the oldest old Chinese, with educated people who live in urban areas having a much lower risk of dying than those uneducated who live in the countryside. This trend concerning the effects of education and residence is consistent with the literature on SES and adult mortality.

Most notably, our study found that an SES differential indeed exists among the extremely old age group. After controlling for the baseline health status, the SES premium is more pronounced, a finding that has not been reported. Previous research suggests that SES may only have minimal or no effects on mortality for people at later old ages (House et al 1990, 1994), although the issues of magnitude and age of convergence have not been solved (Zimmer et al. 1998). In our study, for all three alternative target populations, 80+, 90+, and 100+, SES differentials do not disappear before and after adjustment for health status at the baseline. However, our results do not inform us as to whether or not there is a convergence trend in China, since the SES differentials may have declined from a higher level in an earlier age. We do not have data on persons younger than 80 years to examine the effects of SES on younger groups. However, our findings present clear evidence that SES differentials in mortality do not disappear altogether among the oldest old Chinese, especially for those 100 years old and older.

A possible limitation to this study is that the SES measure is limited by the survey data. As discussed in previous literature, multiple indicators representing different dimensions should be used in examining the SES effect on mortality and health. In this study, the baseline data does not provide SES indicators such as access to medical care, income, house assets and luxury products (i.e., TV, refrigerator, etc) which can reflect financial status in developing countries. In addition, since the oldest old's financial support primarily comes from their children or relatives, their financial situation may not be determined by themselves. Therefore, examining the intergenerational transfer should help us to further understand their socioeconomic status. In this paper, our SES variable is a proxy of socioeconomic status in China. Education and urban residence are both indicator variables, necessarily masking a great amount of heterogeneity *within* the four groups cross-classified by the two variables. Although the SES measure is not ideal, our conclusion still holds because the crudeness of our SES measure tends to exert a conservative bias – diminishing, rather than exaggerating, the SES differentials we can observe.

In summary, this study helps clarify the question of whether SES affects mortality after a certain age. Although initially we expected the relationship to disappear after a particular age, our results revealed that significant SES differentials exist among very old persons. Based on this study, we propose several possible directions in studying the SES-mortality relationship among the oldest old. First, multiple SES indicators such as access to medical care, assets and wealth should be employed in further research. Second, an underlying mechanism between SES and mortality should be addressed. The mediating variables suggested by existing literature still needs to be examined in the context of oldest old Chinese.

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Table 1. Distribution of SES and mortality by SES

| Female | | Number in 1998 | Percentage | Deaths 1998-2002 | Death (%) |
|---|---|---|---|---|---|
| 80+ | | | | | |
| SES | 1 Non-educated, rural | 2785 | 63.9 | 1942 | 43.4 |
| | 2 Non-educated, urban | 1179 | 20.6 | 778 | 44.4 |
| | 3 Educated, rural | 187 | 7.6 | 105 | 30.2 |
| | 4 Educated, urban | 295 | 7.9 | 149 | 34.5 |
| 90+ | | | | | |
| SES | 1 Non-educated, rural | 2068 | 62.4 | 1641 | 69.0 |
| | 2 Non-educated, urban | 786 | 27.4 | 609 | 65.1 |
| | 3 Educated, rural | 99 | 4.5 | 78 | 65.4 |
| | 4 Educated, urban | 133 | 5.7 | 94 | 61.3 |
| 100+ | | | | | |
| SES | 1 Non-educated, rural | 1171 | 63.4 | 979 | 83.5 |
| | 2 Non-educated, urban | 355 | 29.8 | 303 | 85.3 |
| | 3 Educated, rural | 47 | 2.6 | 39 | 82.2 |
| | 4 Educated, urban | 48 | 4.2 | 40 | 84.4 |
| Male | | | | | |
| 80+ | | | | | |
| SES | 1 Non-educated, rural | 855 | 29.4 | 585 | 51.1 |
| | 2 Non-educated, urban | 285 | 5.7 | 204 | 58.8 |
| | 3 Educated, rural | 1031 | 43.4 | 645 | 44.8 |
| | 4 Educated, urban | 773 | 21.5 | 419 | 40.2 |
| 90+ | | | | | |
| SES | 1 Non-educated, rural | 504 | 30.9 | 402 | 70.7 |
| | 2 Non-educated, urban | 169 | 9.0 | 138 | 75.82 |
| | 3 Educated, rural | 531 | 37.1 | 406 | 65.66 |
| | 4 Educated, urban | 336 | 23.0 | 238 | 66.15 |
| 100+ | | | | | |
| SES | 1 Non-educated, rural | 153 | 34.2 | 141 | 92.4 |
| | 2 Non-educated, urban | 55 | 14.7 | 49 | 88.5 |
| | 3 Educated, rural | 148 | 33.3 | 131 | 88.4 |
| | 4 Educated, urban | 65 | 17.8 | 54 | 82.8 |

Note: numbers are unweighted; percentages are weighted.

Table 2. Effects of SES on Mortality (controlling ethnicity and region)

| | Mortality | | |
|---|---|---|---|
| | 80+ | 90+ | 100+ |
| Variable | (1) | (2) | (3) |
| Sex | | | |
| Female | .794*** | .839*** | .884’ |
| Age (time-varying) | 1.006*** | 1.005*** | 1.004*** |
| Interval | 1.007* | 1.006*** | 1.008*** |
| SES | | | |
| Non-educated, rural | omitted | omitted | omitted |
| Non-educated, urban | .989 | .977 | .991 |
| Educated, rural | .918* | .961 | 1.017 |
| Educated, urban | .763*** | .767*** | .771** |

‘ p<0.1; * p<.05; ** p<.01; *** p<.001

Table 3. Effects of SES on Mortality (controlling health, ethnicity and region)

| | Mortality | | |
|---|---|---|---|
| | 80+ | 90+ | 100+ |
| Variable | (1) | (2) | (3) |
| Sex | | | |
| Female | .731*** | .770** | .800** |
| Age (time-varying) | 1.010*** | 1.004*** | 1.004** |
| Interval | 1.005*** | 1.009** | 1.012*** |
| SES | | | |
| Non-educated, rural | omitted | omitted | omitted |
| Non-educated, urban | .977 | .957 | .958 |
| Educated, rural | .960 | 1.019 | 1.077 |
| Educated, urban | .744*** | .743*** | .715** |
| Self-reported health | 1.505*** | 1.460*** | 1.403*** |
| ADL | 1.740*** | 1.711*** | 1.703*** |

* p<.05; ** p<.01; *** p<.001