

# Survival Expectations of Older Indians

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## **Abstract**

*We examine several methodological considerations when eliciting probabilistic expectations in a developing country context using the Longitudinal Ageing Survey of India (LASI). We conclude that although on average individuals are able to understand the concept of probability, responses are sensitive to framing effects and own versus hypothetical person effects. We also find that overall people are pessimistic about their survival probabilities as compared to state-specific life tables and that socio economic status does influence beliefs about own survival expectations as found in previous literature in other countries. Higher levels of education and income have a positive association with survival expectations and these associations persist even when conditioning on self-reported health. The results remain robust to several alternative specifications. We then compare the survival measure to objective measures of health. We find that activity of daily life, height and low haemoglobin levels co-vary with subjective expectations in expected directions.*

Keywords: survival expectations; ageing; biomarkers

JEL Codes: D84, J14 & I12

# 1 Introduction

India, with 1.27 billion inhabitants, has a growing elderly population. Currently 60 million people are aged 65 and over. By 2050 this figure is projected to climb to 222 million (Factbook, 2010; DESA, 2010). An Indian born in 1950 could expect to live for 37 years while an Indian born today can expect to live for 69 years. This is a dramatic increase in the elderly dependency ratio and presents serious impending economic and health challenges which are of particular concern given the level of unemployment and poverty in the country and the lack of an effective healthcare or pension system. This increase in life expectancy also has potential important ramifications for the many intertemporal decisions (such as retirement, bequest, investment, saving, migration and healthcare) that elderly individuals have to make. In this paper, we present unique new evidence on the survival expectations of older Indians.

Asking respondents about verbal expectations (e.g. is this event very likely or very unlikely?) is commonly done in surveys, but those yield only ordinal measures of beliefs. Moreover, responses may not be interpersonally comparable. These concerns lead to the elicitation of probabilistic expectations, where respondents are asked a question that can be interpreted as a probability. Manski (2004) and Hurd (2009) review the literature on the elicitation of probabilistic expectations in developed countries, while Delavande *et al.* (2011) and Delavande (2014) review the parallel literature in developing countries. Both strands of literature emphasize that survey respondents are able and willing to provide their expectations in probabilistic format, that a majority respects basic properties of probabilities, that there is substantial heterogeneity in beliefs, that expectations tend to vary with observable characteristics in the same way as actual outcomes, and that the expectations are useful predictors of future behaviour. However, the existing literature in developing countries has typically focused on younger respondents, and little is known about whether these findings apply to older individuals.

In developed country surveys, the standard method of eliciting subjective probabilities relies on a percent chance format (e.g., "What is the percent chance that you will live to be 75 or more?" as in the U.S Health and Retirement Study - HRS) but this method may be challenging in low numeracy contexts. The most common approach in developing countries has been to use visual aids (such as stones, beans or marbles) to help respondents to express probabilities. For example, Delavande & Kohler (2009), in the Malawi Longitudinal Study of Families and Health, asks respondents to choose 10 beans to express the likelihood of an event happening.

We adopt a similar approach in India, and asked respondent to express the likelihood of being alive in 1 year, 5 years and 10 years using 10 beans.

Because little is known about the best way to elicit survival expectations from elderly in developing countries, our design explicitly addresses several methodological considerations to provide information on the best way to collect these expectations, and to assess their validity and usefulness. First, we asked respondents both about their own survival and about the survival of people like themselves, as respondents may be reluctant to think about their own demise. Second, we randomize the wording in terms of mortality or survival to assess any potential framing effect. In order to assess validity, we investigate how the elicited expectations relate to socioeconomic characteristics and to health biomarkers collected as part of the survey. Finally, we evaluate the relationship between the survival expectations and some intertemporal economic decisions.

Our findings show great promises to elicit subjective expectations from elderly in a context like India. First, response rates are high (e.g., about 87% for ones own probability of survival). Second, violation of the monotonicity property of probabilities is similar among older Indians and older Americans. Third, as one would expect, average survival expectations decrease as the time horizon considered increases. Fourth, survival expectations vary with observable characteristics as expected: younger respondents, those with more education, those from higher caste, those with better self-reported health and those with fewer difficulties in their activity of daily living report higher survival expectations on average. Fifth, shorter respondents (an indicator of poor childhood nutrition (Steckel, 1979) and men with decreased haemoglobin concentration (an indicator of anaemia) report a lower survival expectations on average. Finally, respondents who have a higher one-year survival expectation are more likely to have an outstanding loan, consistent with the idea that they are making an investment for the future. However, we also find that respondents are much more pessimistic about their survival than warranted by existing life table estimates, a pattern seen in other contexts (e.g., Malawi or the US). Women also appear more pessimistic than men, which is also a pattern that has been seen in other contexts (Malawi, US, Europe).

From a methodological point of view, our findings offer some recommendations on the best way to elicit subjective expectations from older respondents in a context like India. First, response rates are not significantly improved by asking about the survival of people like you

instead of own survival. However, there can be large differences in answers, driven by perception of own health. Researchers interested to learn about respondents' own survival should therefore ask about it directly. Second, framing the question in terms of survival or mortality influences respondents' answers. The mean and median subjective survival probability when asked the survival format is higher than when asked the mortality format for both own survival and hypothetical person survival. For the longer time horizons, the difference is quite substantial (for example, 11 percentage points for the 10-year own survival). Once we control for other covariates, this framing effect is observed for the 10-year time horizon only, when uncertainty is likely to be larger, suggesting that responses to expectations questions are reasonable.

This paper complements the existing literature investigating individuals survival expectations. Very few studies have investigated subjective survival expectations in developing countries. Delavande & Kohler (2009) look at survival expectations in Malawi. Like in India, the reported subjective expectations about mortality correspond in broad terms with the actual variation in mortality (e.g., respondents living in regions with higher mortality risks have higher mortality expectations) but they are widely over-estimated. Aguila *et al.* (2014) report the results of various cognitive interviews to assess the best way to elicit survival expectations from older Mexican, and emphasize the usefulness of visual aids. In the US context, a number of in-depth studies have been conducted using the subjective expectations from the HRS. They appear well-calibrated on average, vary systematically with known risk factors and evolve in panel in response to information relevant to survival, such as parental death or onset of disease. For instance, Hurd & McGarry (1995) show that survival expectations are internally consistent and are good approximations to population probabilities. Schoenbaum (1997) compares the subjective survival expectations of smokers to smoking-specific life tables from nationally representative data on the United States and find that survival expectations were close to actuarial predictions. Subjective survival expectations are also found to be predictive of actual survival (Hurd & McGarry, 2002; Bloom *et al.*, 2006; Elder, 2007; Perozek, 2008; Delavande & Rohwedder, 2011). Similar findings have been reported based on subjective probabilities of survival elicited in the English Longitudinal Study of Ageing (ELSA) and the Survey of Health, Ageing and Retirement in Europe (SHARE) (e.g.,(Hurd *et al.*, 2004; Winter, 2008; Balia, 2014; Delavande & Rohwedder, 2011; Menon, 2015)).

The remainder of the paper is organised as follows: Section 2 presents the data and the expectations module. Section 3 examines the methodological considerations when eliciting

subjective expectations from older individuals in a context like India. Section 4 examines the relationships between health measures and subjective expectations in India, while Section 5 assesses whether subjective survival expectations are predictive of investment in the future. Section 6 concludes.

## **2 Data Description**

### **2.1 Longitudinal Ageing Survey of India (LASI)**

We use data collected in the Longitudinal Ageing Survey of India (LASI) pilot survey, which was fielded between October and December 2010. LASI collected data on health, retirement, economic and social well-being of India's elderly population. The LASI instrument was developed to be internationally comparable to the HRS of the United States and is harmonized to other surveys such as the China Health and Retirement Longitudinal Study. Using the 2001 Census, a geographically diverse sample was drawn from 4 states in India: Karnataka, Kerala, Rajasthan and Punjab.<sup>1</sup> LASI consists of a household survey, collected once per household and an individual survey for each age-eligible respondent who is at least 45 years of age and their spouse. The LASI pilot achieved an individual response rate of 90.9%. The total individual sample size is 1683 respondents within 950 households out of whom 1486 are aged 45 years or older. The survey was fielded in Hindi, Kannada, Malayalam and Punjabi, the local native language of each of these states. Computer-assisted personal interviews (CAPI) which lasted for approximately 2 hours were conducted.

### **2.2 Expectations Module**

LASI implemented an expectations module to a randomly selected 33% of the total number of respondents. This module included questions about subjective probabilities of survival to specific ages. Respondents were given preliminary training questions to introduce them to the concept of probability. Out of the 1486 age-eligible respondents, 531 were asked the expectations module. Out of these, 467 respondents are equal to or above the age of 45 years, which is our analytical sample. The expectations module took an average of 5 minutes to complete. The module uses an interactive elicitation technique based on asking respondents to allocate up to 10 beans on a plate to express the likelihood that an event will be realised (Delavande &

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<sup>1</sup>A detailed external validity check has been done in Arokiasamy *et al.* (2012)

Kohler, 2009). Prior to eliciting subjective survival probabilities, the respondents were given an explanation of basic probability concepts and given the following introduction:

*I will ask you several questions about the chance or likelihood that certain events are going to happen. There are 10 beans in the cup. I would like you to choose some beans out of these 10 beans and put them in the plate to help me understand what you think the likelihood or chance is of a specific event happening. If you do not put any beans in the plate, it means you are sure that the event will NOT happen. If you add beans, this means that you think the likelihood that the event happens will increase. For example, if you put one or two beans, it means you think the event is not likely to happen but it is still possible. If you pick 5 beans, it means that it is just as likely it happens as it does not happen (fifty-fifty). If you pick 6 beans, it means the event is slightly more likely to happen than not to happen. If you put 10 beans in the plate, it means you are sure the event will happen. One bean represents one chance out of 10. There is not a right or wrong answer; I just want to know what you think.*

Our analysis focuses on survival expectations. Respondents were asked about their survival in 1 year, 5 years and 10 years. There were two important features of the design that is relevant from a methodological point of view. First, the wording of the questions in terms of survival (alive) or mortality (not alive) was randomized. Second, all respondents were asked both their own survival expectations and survival expectations of a hypothetical individual like themselves. Out of the 467 age-eligible respondents that answered the expectations module, 239 were asked mortality questions while 228 were asked survival questions. The questions were organized and worded as follows:

#### 1. Mortality wording

*I would like to ask you to consider the likelihood that you and other people may not be alive as time goes by. Think about 10 people like you (same age, gender, income, etc). Pick the number of beans that reflects how many*

- (a) *Will die within a one-year period beginning today.*
- (b) *Will die within a 5-year period beginning today.*
- (c) *Will die within a 10-year period beginning today.*

*Now, I would like to ask you to consider the likelihood that you may not be alive as time goes by. We hope that nothing bad will happen to you, but nevertheless, something*

*unfortunate may occur over the next years despite all precautions that you may take. If you dont want to, you do not need to answer this question. Pick the number of beans that reflects how likely you think it is that*

- (a) *You will die within a one-year period beginning today.*
- (b) *You will die within a 5-year period beginning today.*
- (c) *You will die within a 10-year period beginning today.*

## 2. Survival wording

*I would like to ask you to consider the likelihood that you and other people may be alive as time goes by. Think about 10 people like you (same age, gender, income, etc). Pick the number of beans that reflects how many*

- (a) *Will be alive in one year.*
- (b) *Will be alive in 5 years.*
- (c) *Will be alive in 10 years.*

*Now, I would like to ask you to consider the likelihood that you may be alive as time goes by. We hope that nothing bad will happen to you, but nevertheless, something unfortunate may occur over the next years despite all precautions that you may take. If you dont want to, you do not need to answer this question. Pick the number of beans that reflects how likely you think it is that*

- (a) *You will be alive in one year.*
- (b) *You will be alive in 5 years.*
- (c) *You will be alive in 10 years.*

### **2.3 Demographics characteristics of the analytical sample**

Out of the 467 age eligible respondent who was asked the expectations module, 391 respondents have full information on all demographic variables of interest. Our analysis using demographic controls is thus restricted to these 391 respondents to ensure results are not driven by differing sample compositions. Table .1 presents the demographic composition of this analytical sample: respondents who were selected to answer the expectation module. Male respondents and female respondents are almost equally represented in the sample. 46% of our

sample are between 45 years and 54 years of age and 8% of the sample are above 75 years of age with the oldest respondent being 96 years of age. 37% of the analytical sample belongs to the high/other caste community with the rest being divided into each of the three lower caste communities. 46% of the sample has no schooling. There are gender differences in educational attainment with males having an overall greater educational attainment than females, which is consistent with the gender differences in the national representation of educational attainment. The income variable used is self-rated by the respondent in answer to the question: "*Compared to other households in this (geographic) community, how do you consider your household?*" The responses were recorded in income quintiles. The top two quintiles of well off and very well off have been collapsed due to small numbers in these categories. There is an almost equal representation from each of the 4 states that were surveyed. For 7% of the respondents, both parents are alive at the time of the survey. 62% of the respondents report their health as being good or very good.

### **3 Can we ask survival expectations of older respondents in low-income countries? Methodological considerations**

In this section we review the methodological considerations to be taken into account when eliciting survival probabilities from an older population in a developing country. We use the age-eligible sample of 467 respondents for this section to take advantage of the larger sample size and to enable reporting of response rates. Note that respondents are willing to report their beliefs in probabilistic formats: response rates are high for own probability of survival, about 87%.

#### **3.1 Do older respondents understand the concept of probabilities?**

After reading the introduction, the interviewers checked if the respondents understood the concepts of probability with some practice questions.

Respondents were then asked to pick the number of beans that reflects the probability of going to the market within 2 days and within 2 weeks to assess whether they would respect the monotonicity property of nested events. 447 out of the 467 respondents answered this question which translated to a 4% non-response rate. Figure 1 presents the difference in the probability of going to the market within 2 days and the probability of going to the market



within 2 weeks for 447 of the respondents for whom we have complete data. A negative statistic is a violation of the monotonicity criterion of nested events which occurs in 21% of the sample. This is consistent with previous studies eliciting subjective expectations among the elderly in developed countries (approximately 23% in the survival expectations questions in the HRS). Out of this 54% of the sample who violated monotonicity has no schooling. This is more than what has been reported in other developing countries with a younger sample. For example Delavande & Kohler (2009) find that 1.41% of their sample in Malawi violates monotonicity when asked the probability of going to the market in the first instance.

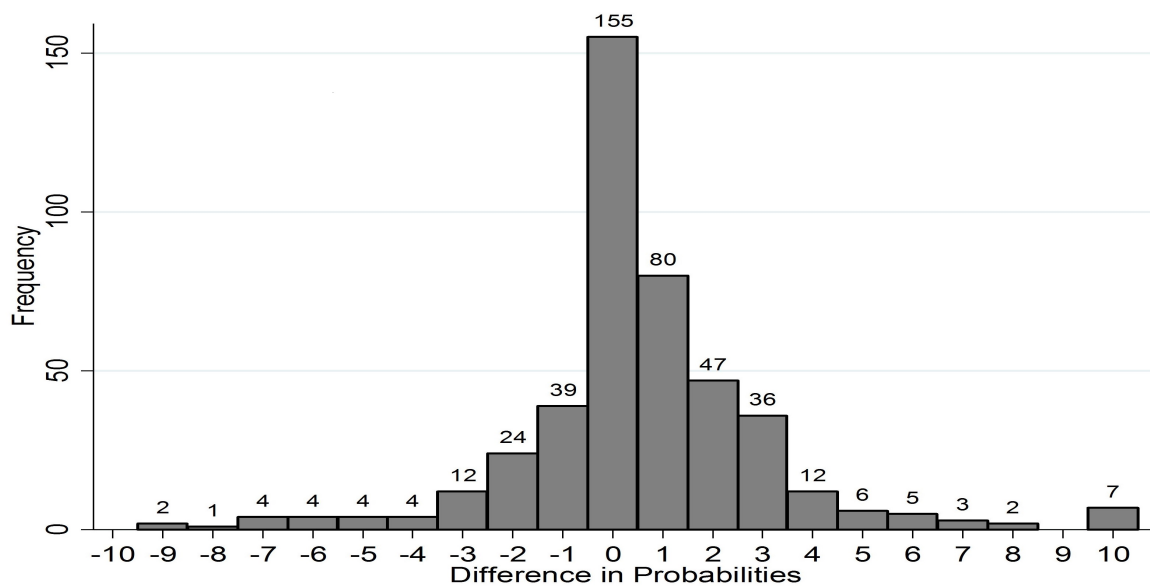


Figure 1: Difference in probabilities of going to the market

The respondents, who violated the criterion, were subsequently given the following information:

*“Remember, as time goes by, you may find more time to go to the market. Therefore, there is a higher chance that you go to the market within 2 weeks than within 2 days. So you should put more beans for the likelihood of going to the market within 2 weeks than within 2 days. Let me ask you again.”*

These respondents were then asked the question regarding the probability of going to the market again. Only 20 of the 447 respondents continue to violate the criterion.

Respondents were also asked a question to assess whether they understand that complementary events have a probability summing up to one. In particular, in the context of a game of Ludo, the questions were:

*”Pick the number of beans that reflects how likely you think it is that*

- *You will win the game*
- *You will lose the game”*

423 out of the 467 respondents answered this question. 35% of this sample correctly assigned probabilities to each outcome so that the sum of both would equal to one. Since respondents are given 10 beans where each bean represents 10% likelihood, it is plausible that respondents may be rounding their actual probabilities (Manski & Molinari, 2010). The sum of the proportion of the sample that report probabilities between +1 and -1 is 52%. Note that we are not aware of other surveys asking similar questions about complementary events, so we do not have a benchmark. Overall, respondents seem more familiar with the idea of monotonicity than complementarity.

### **3.2 Survival expectations by time horizon**

In order to compare the various formats used to elicit expectations, we recode the mortality responses into survival and express all responses in survival terms on a scale from 0 to 1. Figure 2 shows the distribution of all 3 survival periods. It shows that respondents are aware that survival probability decreases as the time horizon increases. For example, the percentage of respondents who report a survival probability of 1 in the 1-year period is 24% as compared to 14% of respondents who report the same for the 10-year survival period. When looking at monotonicity violations in the survival expectations responses at the individual level, we find that on average 25% of the respondents violate among all three time periods. Specifically when comparing the 1-year survival period to the 5-year survival period, 26% of respondents violate monotonicity. When comparing the 5-year to the 10-year survival period and the 1-year to the 10-year survival period, monotonicity violations are at 22% and 27% respectively.

Heaping at 0.5 is also a common feature of subjective expectations. Previous studies have shown that expectations of 0.5 may be indicative of epistemic uncertainty (e.g., de Bruin *et al.*, 2000). This is consistent in the LASI data with uncertainty increasing as the time horizon increases. Respondents are more likely to report 0.5 in the 5-year and 10-year survival periods of 19.27% and 20.25% respectively as compared to 16.22% in the 1-year survival period.

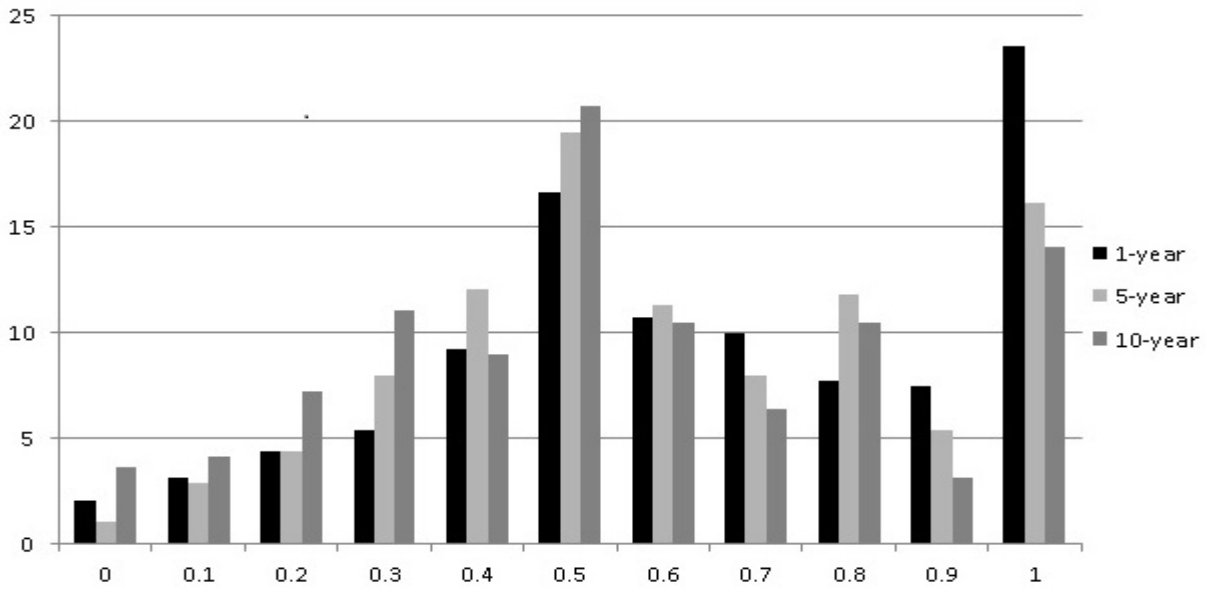


Figure 2: Distribution of subjective probability of Survival (weighted)

### 3.3 You versus Other people like you

In addition to asking respondents to report their own survival expectations, they are asked to think of 10 people like themselves and to report the survival expectations for these hypothetical individuals. This has been done in previous studies for example in McKenzie *et al.* (2008) and Aguila *et al.* (2014). The potential advantage of this wording of the question is to improve response rates, as people may be less reluctant to think about the mortality of others. However, it is conceptually a different expectation than ones own expectations: answers may vary between own and hypothetical person survival as respondents may make unobservable assumptions about the characteristics of the hypothetical individuals. Researchers interested in explaining how mortality expectations influence *individual* decision-making want to elicit respondents' own expectations. There may be trade-off between better response rates and precise survival estimates (see discussion in Delavande (2014)). Table .2 presents the summary statistics of own survival and hypothetical survival. Response rates are only slightly higher for hypothetical persons survival probability as opposed to own survival probability, and not statistically significantly different. Regarding the average levels of expectations, beliefs about own survival relative to a hypothetical persons survival are similar. The unpaired t-test for equality in means between own survival and the survival of a hypothetical person is not significant in all three time frames.

We investigate further the difference of expectations at the individual levels. Table .3

presents the summary statistics of the difference in the responses between own survival and hypothetical survival for those respondents who had different answers. About 55% of the respondents report a different answer. The differences in the responses are quite small on average and vary between -0.01 and 0.02 in the three survival periods but the percentiles show that they can be large for some individuals. For example, the 25th and 75th percentiles correspond to a very large difference of 20 percentage points.

In Table .12, we seek to evaluate whether individual characteristics and self-reported health are predictive of the difference between own survival and that of the hypothetical individual. For this analysis we restrict the sample to respondents whose responses differed between the own survival and hypothetical survival wording of the questionnaire. Table .12 presents the OLS coefficients using the difference in beliefs as dependent variables. Demographic and socio-economic characteristics have essentially no predictive power for this difference. However, as one would expect, respondents with relatively poor self-reported health status are also likely to report differential survival probabilities as compared to a hypothetical individual.

Overall, in the context of this study, response rates are not significantly improved by asking about the survival of people like you instead of own survival. However, there can be large differences in answers, driven by the perception of own health. Researchers interested to learn about respondents' own survival should ask about it directly.

### **3.4 Mortality versus Survival**

Previous studies have shown that framing can have an effect on survey responses (e.g., Tversky & Kahneman, 1981). Studies examining the framing effect specifically on survival and mortality format of questionnaires have shown mixed results. Some studies fail to find a significant effect (e.g., Miller & Fagley, 1991) while some studies find a significant effect that is small in magnitude (Levin *et al.* (1998) provides an overview).

Respondents in the expectations module of LASI were randomised between the survival format of the question and the mortality format of the question (see Section 2.2). Table .4 presents the summary statistics for the mortality versus survival format of the questions. To enable comparison, responses to the mortality format of the questionnaire have been re-coded in survival terms. For our age-eligible sample of 467 respondents, 239 were asked the mortality format of the question while 228 were asked the survival format of the question. The question

format does not seem to systematically influence response rate as the difference in response rate is not statistically different across the two formats. However, respondents reported feeling a bit uncomfortable talking about their own mortality to interviewers.

The mean and median subjective survival probability when asked the survival format is higher than when asked the mortality format for both own survival and hypothetical person survival. For the larger time horizons, the difference is quite substantial (for example, 11 percentage points for the 10-year own survival). The t-test for equality of means between mortality and survival format of the questionnaire is significant in the 5 year and 10 year survival period for own survival and in the 10 year survival period for the survival of a hypothetical individual. There is therefore a framing effect for longer time horizons, with respondents allocated in the mortality format being more pessimistic about survival than those allocated in the survival format. Once we control for other covariates, the framing effect is observed for the 10-year time horizon only, when uncertainty is likely to be larger (see discussion in Section 4.1).

### **3.5 Do subjective probabilities of survival vary by socioeconomic characteristics?**

We now investigate whether the subjective probability of survival vary with socio-economic characteristics similarly as actual survival is known to vary with those. Table .5 presents the mean subjective probability of own survival and hypothetical person survival by characteristics. Means are weighted by the pooled individual weight to provide survey design adjusted standard errors across the four states. There are a few important remarks based on this table. First, as already shown in Section 3.2, survival expectations decrease as the time horizon considered increases: for example, the difference in survival subjective probability within 1 year and within 10 years is 10 percentage points. Second, survival expectations decrease as age increases, in almost all cases. For example, respondents aged 45 to 54 expect a 63% chance of being alive in the next 5 years on average while the 75+ expect a 51% chance. Third, there is a clear caste and education gradient in the responses. High caste respondents report higher expectations of own survival in all 3 time horizons. Respondents with at least a high school education report higher survival expectations in all three time horizons for both own survival and the survival of a hypothetical person. Fourth: women and men have similar levels of expectations, while women have larger life expectancy (male life expectancy at birth is 63 years while female life expectancy at birth is 66 years, World Health Organization, 2011).

The survival responses according to the income category of the respondent are mixed. Respondents from a household with income well below average report lower survival probabilities, as do the really well off respondents. A possible explanation is that very high income respondents may be more health literate and so may adjust their survival expectations accordingly (Bloom, 2005). There is considerable heterogeneity between states with Karnataka reporting lower survival responses than the other states in all three time periods and for own and hypothetical person survival.

### **3.6 Are survival expectations accurate?**

To further assess the validity of respondents survival expectations, we compare subjective survival expectations to life table estimates based on the Sample Registration System and published by the Government of India (System, 2012). The SRS is a large scale demographic survey based on a dual recording system which provides reliable mortality estimates at state and national levels. Abridged life tables are created using the mortality package MORTPACK 4, the UNs software package for mortality measurements. For the purpose of our analysis, we use the revised life table reports for the period 2006-2010. The comparison is therefore not completely ideal to assess accuracy as we are comparing 2010 life tables with prospective survival, but is still a useful exercise.

The top panel in Table .6 presents the state life table estimates for the 5 year and 10 year survival periods for the overall sample and the state specific life table estimates. The lower panel presents the overall and state wise subjective survival estimates.

There are two important things to note from this table. First, people are much more pessimistic about their survival probabilities than is warranted by existing life table estimates. Overall, respondents report a 61% chance of being alive in the next 5 years while equivalent life table statistic is 84%. On average, the survival expectations of men are closer to the life table estimates as compared to women (not shown). If anything, one would expect life expectancy not to deteriorate in the coming years, so this difference is unlikely to be driven by respondents being forward-looking and predicting a reduction in life expectancy. A similar phenomenon has been observed in Malawi (Delavande & Kohler, 2009). Second, individuals seem unaware of the protective effect of residing in certain states. In the state life table estimates, there is a clear ordering of the survival forecasts i.e. Karnataka, Kerala, Punjab and Rajasthan in order of decreasing survival forecast. For both the 5-year and 10-year survival

periods, Karnataka has the highest survival probabilities as reported by the state life table estimates while Rajasthan has the lowest survival probabilities. With respect to subjective survival probabilities there does not exist such a clear ranking. Kerala has the highest survival expectation in the 5-year period while Rajasthan has the highest in the 10-year period. Karnataka has the lowest survival expectation in the 5-year period and in the 10-year period.

## **4 Health measures and subjective survival expectations**

In this section we evaluate how various measures of health are correlated with the elicited survival expectations. We focus on self-reported health, activities of daily living and objective biomarkers.

### **4.1 Self-reported health**

Self-reported health has been shown to be good predictors for mortality (Burström & Fredlund, 2001; Idler & Benyamini, 1997). In the context of India, self-reported health measures have been shown to be reliable measures of health when estimates are conditioned on region (Chen & Mahal, 2010).

Table .7 presents an OLS regression investigating the predictive power of self-reported health, after conditioning on demographic characteristics. As comparison, the first 3 columns shows results when we only control for demographic characteristics.

As already seen in Section 3, some indicators of socio-economic status and state of residence are correlated with beliefs. Also, having one or both parents dead is associated with lower probability of survival. As seen in columns 4 to 6, self-reported health status has a negative relationship with survival probabilities, which is statistically significant in all 3 time horizons. The magnitude of the effect is very large: for example, those who rate their health as very poor have a subjective probability of survival, which is 0.36 point lower compared to those who rate their health as very good. Survival expectations are therefore in line with self-reported health, even after conditioning for other characteristics.<sup>2</sup>

Interestingly, we also find a framing effect of the questionnaire format (survival vs. mortality) in the 10-year survival period of 0.11. This suggests that respondents are more influenced by the framing of the questionnaire when the survival time period in question is longer, and

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<sup>2</sup>Recoding responses of 0 to 0.1 and responses of 1 to 0.9 does not alter our results significantly

therefore when there is presumably more uncertainty.

## 4.2 Activity of Daily Life

LASI also collected self-reported disability rates measured by difficulty with at least one activity of daily life (ADL). Self-reported measures have previously been shown to be reliable measures of health in India (Subramanian *et al.*, 2009). Table .8 presents the proportion of respondents within the analytical sample in each measure of the ADL who reported having a difficulty. We coded a factor score of ADL using the above measures through a principle component analysis. A high score on the ADL thus means the respondent does not have a difficulty in any of the 6 ADLs while a low score indicates that the respondent has difficulties in one or more of the 6 ADLs. The top panel in Table .9 presents the estimates of the association between subjective survival probability and self-reported measures of ADL. These are based on OLS regressions similar to those in the first 3 columns of Table 7. Each cell in Table 8 reports the results of separate estimations with all the control variables used in the main specification. Subjective survival probabilities in the 1-year time horizon and 5-year time horizon is positively correlated with ADL measures with a coefficient of and 0.03 and 0.02 respectively.

## 4.3 Biomarkers

LASI included a biomarker content, which includes anthropometric measures, blood pressure readings, vision and physical functioning test, and a collection of dried blood samples (Bloom *et al.*, 2014). This data allows us to compare subjective survival expectations in India with objective measures of health collected through the direct assessment of biomarkers. Among the 1683 individuals interviewed for LASI, 1311 completed the biomarker module which translates to a 77.9% completion rate.

The second panel in table 8 shows the association between high blood pressure and survival expectations. We find a negative but insignificant relationship in all three time periods.

Several studies have established an association between height, early life nutritional status, morbidity and mortality (Bhalotra & Rawlings, 2011; Monden *et al.*, 2009). The average height of men in our analytical sample is 165.5cm and for women it is 153.1cm. The third panel in Table .9 presents the association between height and subjective survival probability of the respondents. There exists a positive relationship between height and survival probability all three time horizons with a magnitude of 0.005.



Decreased haemoglobin concentrations are an indicator for anaemia which is highly prevalent in developing countries. Lower levels of haemoglobin have been shown to predict mortality and morbidity (Guralnik *et al.*, 2004; Tolentino & Friedman, 2007). In LASI, haemoglobin levels were measured using an ELISA (Enzyme-Linked Immunosorbent Assay) protocol based on the O’Broin and Gunter method (D O’Broin & Gunter, 1999). Mean haemoglobin level for our analytical sample is 14.3 g/dl, which is slightly above the mean of the LASI biomarker sample of 14.1g/dl. We create a binary indicator for low haemoglobin levels based on standard clinical cut points of 12.0g/dl for women and 13.0g/dl for men (World Health Organization, 2001). 19% (66 respondents) of our analytical sample have low haemoglobin levels out of whom 73% (48 respondents) are women.

We find a strong negative association between low haemoglobin concentrations and subjective survival expectations in the 1 year and 5 year period for men with magnitudes of 0.14 and 0.17 respectively as shown in Table .10. We find no significant effects for women.

## 5 Survival expectations and expenditure

In this section we explore the association between survival expectations and some economic decisions of the respondents to evaluate whether survival expectations are correlated with forward looking decisions where how long one expect to leave should matter. We use two dependent variables in our analysis; savings and loans. We expect people with higher survival expectations to be more likely to have a loan (i.e. they are making investments) and to have higher savings. Respondents were asked to provide an approximate value of savings accounts, postal accounts and certificates of deposits.<sup>3</sup> The summary statistics for these variables are provided in the last panel of Table 1 in Section 2.3. Respondents were asked to report an approximate value of savings accounts, postal accounts and certificates of deposits. We drop the top 1% of the data (N=1) to reduce the effect of outliers. The average value of savings reports was INR 35,521 with a standard deviation of INR 66,923. Bank loan is a binary variable with 1 indicating that the respondent has an outstanding loan from a bank. 13% (50 respondents) of the analytical sample reported having an outstanding bank loan. Table .11 presents the results

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<sup>3</sup>Savings is a sub-component of an answer to the question: Do you or members of your household possess any of the following financial assets? 1. Current accounts 2. Savings accounts 3. Stocks or mutual funds 4. Bonds 5. Outstanding balances in kitty parties, chit funds, bishi etc. 6. Other 7. None of the above. Thus our sample size is lower as it only includes the savings sub-component of this response with 0 indicating respondents who do not report any savings.

of the association between survival expectations, outstanding loans and savings. An increase in the 1-year survival expectation is positively associated with a 0.12 percentage point increase of having an outstanding bank loan. We created quintiles savings and use this as the dependent variables in the last three columns in Table 10. We find a negative association between savings and survival expectations in the 1-year time period and a positive association in the 5-year and 10-year time period but with no statistical significance. Our results are not sensitive to coding savings in quartiles or deciles.

## **6 Conclusion**

This paper is a thorough investigation of older individuals' subjective survival expectations in India. We inspect several methodological contemplations with regards to eliciting subjective survival expectations in the developing country context. We conclude that although on average individuals are able to understand the concept of probability, responses are sensitive to framing effects and own versus hypothetical person effects. We also find that overall people are pessimistic about their survival probabilities as compared to state specific life tables.

Next, we examine socio-economic gradients in the Indian context for three time periods of survival; 1-year, 5-year and 10-year survival. We find that socio economic status does influence beliefs about own survival expectations as found in previous literature in several other countries. Higher levels of education and income have a positive association with survival expectations and these associations persist even when conditioning on self-reported health. There are significant state level differences in survival expectations. The results remain robust to several alternative specifications.

We then compare the survival measure to objective measures of health. The distinct advantage of anthropometric and biomarker data is that they are objective markers of health and free from respondent reporting errors. We find that activity of daily life, height and low haemoglobin levels co-vary with subjective expectations in expected directions. We also find that survival expectations are predictive of investments for the future. Overall, our findings suggest that researchers can ask subjective expectations of older survey respondents in a context like India.

## References

- Aguila, Emma, Borges, Abril, Castillejos, Cielo Margot, Pierson, Ashley, & Weidmer, Beverly A. 2014. Mortality Expectations of Older Mexicans.
- Arokiasamy, P, Bloom, D, Lee, J, Feeney, K, & Ozolins, M. 2012. Longitudinal aging study in India: Vision, design, implementation, and preliminary findings. *Aging in Asia: findings from new and emerging data initiatives*, 36–74.
- Balia, Silvia. 2014. Survival expectations, subjective health and smoking: evidence from SHARE. *Empirical Economics*, **47**(2), 753–780.
- Bhalotra, Sonia, & Rawlings, Samantha B. 2011. Intergenerational persistence in health in developing countries: The penalty of gender inequality? *Journal of Public Economics*, **95**(3), 286–299.
- Bloom, D, Hu, P, Arokiasamy, P, Risbud, A, Sekher, TV, Mohanty, SK, Kale, V, OBrien, J, Chien, CS, & Lee, J. 2014. Longitudinal Aging Study In India: Biomarker Documentation. *RAND Work. Pap. WR-1043*.
- Bloom, David E. 2005. Education and public health: Mutual challenges worldwide. *Comparative Education Review*, **49**(4), 437–451.
- Bloom, David E, Canning, David, Moore, Michael, & Song, Younghwan. 2006. *The effect of subjective survival probabilities on retirement and wealth in the United States*. Tech. rept. National Bureau of Economic Research.
- Burström, Bo, & Fredlund, Per. 2001. Self rated health: Is it as good a predictor of subsequent mortality among adults in lower as well as in higher social classes? *Journal of epidemiology and community health*, **55**(11), 836–840.
- Chen, Bradley, & Mahal, Ajay. 2010. Measuring the health of the Indian elderly: evidence from National Sample Survey data. *Population health metrics*, **8**(1), 30.
- D O’Broin, Sean, & Gunter, Elaine W. 1999. Screening of folate status with use of dried blood spots on filter paper. *The American journal of clinical nutrition*, **70**(3), 359–367.

- de Bruin, Wändi Bruine, Fischhoff, Baruch, Millstein, Susan G, & Halpern-Felsher, Bonnie L. 2000. Verbal and numerical expressions of probability: It's a fifty-fifty chance. *Organizational behavior and human decision processes*, **81**(1), 115–131.
- Delavande, Adeline. 2014. Probabilistic Expectations in Developing Countries. *Annu. Rev. Econ.*, **6**(1), 1–20.
- Delavande, Adeline, & Kohler, Hans-Peter. 2009. Subjective Expectations in the Context of HIV/AIDS in Malawi. *Demographic research*, **20**, 817.
- Delavande, Adeline, & Rohwedder, Susann. 2011. Differential survival in Europe and the United States: estimates based on subjective probabilities of survival. *Demography*, **48**(4), 1377–1400.
- Delavande, Adeline, Giné, Xavier, & McKenzie, David. 2011. Measuring subjective expectations in developing countries: A critical review and new evidence. *Journal of Development Economics*, **94**(2), 151–163.
- DESA, UN. 2010. *United Nations, Department of Economic and Social Affairs, Population Division: World Urbanization Prospects, the 2009 Revision: Highlights*.
- Elder, Todd E. 2007. Subjective survival probabilities in the Health and Retirement Study: Systematic biases and predictive validity. *Michigan Retirement Research Center Research Paper No. WP*, **159**.
- Factbook, CIA. 2010. The world factbook. See also: <https://www.cia.gov/library/publications/the-world-factbook>.
- Guralnik, Jack M, Eisenstaedt, Richard S, Ferrucci, Luigi, Klein, Harvey G, & Woodman, Richard C. 2004. Prevalence of anemia in persons 65 years and older in the United States: evidence for a high rate of unexplained anemia. *Blood*, **104**(8), 2263–2268.
- Hurd, Michael D. 2009. Subjective probabilities in household surveys. *Annual Review of Economics*, **1**, 543.
- Hurd, Michael D, & McGarry, Kathleen. 1995. Evaluation of the subjective probabilities of survival in the health and retirement study. *Journal of Human resources*, S268–S292.

- Hurd, Michael D, & McGarry, Kathleen. 2002. The predictive validity of subjective probabilities of survival\*. *The Economic Journal*, **112**(482), 966–985.
- Hurd, Michael D, Smith, James P, & Zissimopoulos, Julie M. 2004. The effects of subjective survival on retirement and social security claiming. *Journal of Applied Econometrics*, **19**(6), 761–775.
- Idler, Ellen L, & Benyamini, Yael. 1997. Self-rated health and mortality: a review of twenty-seven community studies. *Journal of health and social behavior*, 21–37.
- Levin, Irwin P, Schneider, Sandra L, & Gaeth, Gary J. 1998. All frames are not created equal: A typology and critical analysis of framing effects. *Organizational behavior and human decision processes*, **76**(2), 149–188.
- Manski, Charles F. 2004. Measuring expectations. *Econometrica*, 1329–1376.
- Manski, Charles F, & Molinari, Francesca. 2010. Rounding probabilistic expectations in surveys. *Journal of Business & Economic Statistics*, **28**(2), 219–231.
- McKenzie, David, de Mel, Suresh, & Woodruff, Christopher. 2008. Returns to capital: Results from a randomized experiment. *Quarterly Journal of Economics*, **123**(4), 1329–72.
- Menon, Seetha. 2015. *Out-of-range biomarker results and subjective survival expectations in ELSA*. Unpublished.
- Miller, Paul M, & Fagley, Nancy S. 1991. The effects of framing, problem variations, and providing rationale on choice. *Personality and Social Psychology Bulletin*, **17**(5), 517–522.
- Monden, Christiaan WS, Smits, Jeroen, *et al.* 2009. Maternal height and child mortality in 42 developing countries. *American Journal of Human Biology*, **21**(3), 305.
- Perozek, Maria. 2008. Using subjective expectations to forecast longevity: Do survey respondents know something we dont know? *Demography*, **45**(1), 95–113.
- Schoenbaum, Michael. 1997. Do smokers understand the mortality effects of smoking? Evidence from the Health and Retirement Survey. *American Journal of Public Health*, **87**(5), 755–759.

- Steckel, Richard H. 1979. Slave height profiles from coastwise manifests. *Explorations in Economic History*, **16**(4), 363–380.
- Subramanian, SV, Subramanyam, Malavika A, Selvaraj, Sakthivel, & Kawachi, Ichiro. 2009. Are self-reports of health and morbidities in developing countries misleading? Evidence from India. *Social science & medicine*, **68**(2), 260–265.
- System, Sample Registration. 2012. *Analytical Studies - Report Number-1*. Tech. rept.
- Tolentino, Karine, & Friedman, Jennifer F. 2007. An update on anemia in less developed countries. *The American journal of tropical medicine and hygiene*, **77**(1), 44–51.
- Tversky, Amos, & Kahneman, Daniel. 1981. The framing of decisions and the psychology of choice. *Science*, **211**(4481), 453–458.
- Winter, Joachim. 2008. Population Aging, Intergenerational Transfers and the Macroeconomy. *Ageing and Society*, **28**.
- World Health Organization. 2001. Iron deficiency anaemia: assessment, prevention and control: a guide for programme managers.
- World Health Organization. 2011. *World Health Statistics*. Tech. rept.

## Appendix

Table .1: Summary statistics of demographics

<b>Variable</b>	<b>Categories</b>	<b>N</b>	<b>Mean</b>
Gender	Male	391	0.50
	Female	391	0.50
Age	45 - 54	391	0.46
	55 - 64	391	0.29
	65 - 74	391	0.17
	75+	391	0.08
Caste	scheduled caste	391	0.14
	scheduled tribe	391	0.12
	other backward class	391	0.37
	Other Caste	391	0.37
Education	no schooling	391	0.46
	primary/middle school	391	0.36
	high school or more	391	0.18
Income	well below average	391	0.16
	below average	391	0.29
	about average	391	0.47
	well off	391	0.08
State	Punjab	391	0.26
	Rajasthan	391	0.24
	Kerala	391	0.25
	Karnataka	391	0.25
Survival Format		391	0.50
Either parent is dead		391	0.93
Self-reported Health	Very Good	391	0.02
	Good	391	0.6
	Fair	391	0.31
	Poor	391	0.06
	Very Poor	391	0.02
Objective Measures of Health	Activity of Daily Life	319	0.00
	Height	370	159.08
	High Blood Pressure	309	0.19
	Undiagnosed High BP	308	1.81
	Anaemia	343	0.19
Financial Variables	Savings (INR)	129	35520.54
	Outstanding bank loan	391	0.13

Table .2: Summary statistics of own versus hypothetical person survival

Stats	Own Mortality			Hypothetical Person Mortality		
	1 years	5 years	10 years	1 years	5 years	10 years
Mean	0.65	0.61	0.55	0.63	0.61	0.56
p25	0.60	0.60	0.50	0.60	0.60	0.50
p50	0.50	0.40	0.30	0.50	0.40	0.40
p75	0.90	0.80	0.80	0.90	0.80	0.80
p-values of unpaired t-test for equality of means*				0.32	0.89	0.73
N	407	410	405	423	420	420
Response Rate	0.87	0.88	0.87	0.91	0.90	0.90
p-values of unpaired t-test for equality of response rates**				0.10	0.30	0.13

\*Unpaired t-test for equality of means between own versus hypothetical survival

\*\*Unpaired t-test for equality of response rates between own versus hypothetical survival

Table .3: Summary Statistics of difference between own survival and hypothetical person survival

stats	1 years	5 years	10 years
Proportion with different responses	53.96	55.03	55.89
mean	0.03	0.01	-0.01
p50	0.10	0.10	0.10
p25	-0.20	-0.20	-0.20
p75	0.20	0.20	0.20
N	252	257	261
p-values of unpaired t-test for mean different from zero	0.91	0.90	0.38



Table .4: Summary statistics of mortality format versus survival format

<b>Mortality Format</b>						
Stats	<b>Own Mortality</b>			<b>Hypothetical Person Mortality</b>		
	1 years	5 years	10 years	1 years	5 years	10 years
Mean	0.64	0.58	0.50	0.62	0.60	0.51
p25	0.60	0.50	0.50	0.60	0.50	0.50
p50	0.40	0.40	0.30	0.40	0.40	0.40
p75	0.90	0.80	0.70	0.90	0.80	0.70
N	205	203	203	214	214	213
Response Rate	0.86	0.85	0.85	0.90	0.90	0.89
<b>Survival Format</b>						
Stats	<b>Own Survival</b>			<b>Hypothetical Person Survival</b>		
	1 years	5 years	10 years	1 years	5 years	10 years
Mean	0.67	0.65	0.61	0.65	0.62	0.61
p25	0.70	0.70	0.60	0.60	0.60	0.60
p50	0.50	0.50	0.50	0.50	0.50	0.50
p75	0.10	0.90	0.80	0.90	0.80	0.80
N	202	207	202	209	206	207
Response Rate	0.89	0.91	0.89	0.92	0.90	0.91
p-values of unpaired t-test for equality of means*	0.21	0.01	0.00	0.35	0.34	0.00
p-values of unpaired t-test for equality of response rates**	0.84	0.79	0.95	0.74	0.60	0.69

\*Unpaired t-test for equality of means between mortality and survival format of the questionnaire

\*\*Unpaired t-test for equality of response rates between mortality and survival format of the questionnaire

Table .5: Mean Subjective Probability of Survival (weighted)

	Own Survival			Hypothetical Person Survival		
	1-year survival	5-year survival	10-year survival	1-year survival	5-year survival	10-year survival
ALL	0.65	0.61	0.55	0.63	0.61	0.56
men	0.65	0.62	0.56	0.63	0.62	0.58
women	0.65	0.61	0.55	0.64	0.60	0.55
age	0.65	0.63	0.57	0.63	0.63	0.58
45 54	0.69	0.64	0.58	0.67	0.62	0.56
55 64	0.64	0.59	0.48	0.60	0.56	0.53
65 74	0.60	0.51	0.48	0.55	0.57	0.50
75+	0.60	0.59	0.53	0.60	0.59	0.51
caste	0.59	0.59	0.56	0.61	0.59	0.59
scheduled caste	0.66	0.61	0.55	0.62	0.62	0.58
scheduled tribe	0.68	0.63	0.56	0.66	0.62	0.55
other backward class	0.60	0.58	0.54	0.58	0.58	0.55
Other Caste	0.68	0.62	0.53	0.67	0.64	0.54
education	0.73	0.70	0.63	0.69	0.65	0.61
no schooling	0.57	0.60	0.59	0.60	0.59	0.58
primary/middle schooling	0.69	0.63	0.56	0.63	0.63	0.56
High school or more	0.67	0.61	0.53	0.65	0.61	0.55
Income	0.56	0.57	0.54	0.62	0.59	0.55
well below average	0.63	0.58	0.52	0.6	0.57	0.48
below average	0.67	0.65	0.61	0.65	0.61	0.55
about average	0.56	0.57	0.54	0.62	0.59	0.55
well off	0.63	0.58	0.52	0.6	0.57	0.48
state	0.67	0.65	0.61	0.65	0.63	0.64
Punjab	0.80	0.71	0.58	0.76	0.67	0.57
Rajasthan	0.51	0.52	0.51	0.52	0.57	0.55
Kerala	407	410	405	423	420	420
Karnataka						
N	407	410	405	423	420	420

Table .6: State Life table summary statistics

State life table estimates														
Overall			Punjab			Rajasthan			Kerala			Karnataka		
stats	5-year survival	10-year survival	5-year survival	10-year survival	5-year survival	10-year survival	5-year survival	10-year survival	5-year survival	10-year survival	5-year survival	10-year survival		
mean	0.84	0.68	0.82	0.66	0.82	0.66	0.83	0.66	0.88	0.73	0.88	0.73		
p50	0.91	0.78	0.89	0.74	0.92	0.81	0.88	0.73	0.92	0.80	0.92	0.80		
p25	0.79	0.56	0.79	0.55	0.73	0.47	0.79	0.56	0.87	0.69	0.87	0.69		
p75	0.94	0.86	0.93	0.84	0.95	0.87	0.94	0.85	0.95	0.87	0.95	0.87		
N	400	400	103	103	95	95	98	98	104	104	104	104		
Subjective Survival Expectations														
stats	5-year survival	10-year survival	5-year survival	10-year survival	5-year survival	10-year survival	5-year survival	10-year survival	5-year survival	10-year survival	5-year survival	10-year survival		
mean	0.61	0.56	0.58	0.52	0.65	0.62	0.71	0.59	0.52	0.51	0.52	0.51		
p50	0.60	0.50	0.60	0.50	0.60	0.60	0.80	0.55	0.50	0.50	0.50	0.50		
p25	0.40	0.30	0.40	0.30	0.40	0.40	0.50	0.40	0.40	0.35	0.40	0.35		
p75	0.80	0.80	0.80	0.70	0.90	0.80	1.00	0.80	0.60	0.60	0.60	0.60		
N	400	400	103	103	95	95	98	98	104	104	104	104		
p-value of t-test*	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.05	0.00	0.00	0.00	0.00		

\*Unpaired t-test for equality of means between state life table estimates and subjective survival expectations

Table .7: Basic Regressions of socio demographic characteristics and self -reported health on survival

	Basic Reg			Basic Reg + self-rated health		
	1-year survival	5-year survival	10-year survival	1-year survival	5-year survival	10-year survival
Male						
Female	0.020 [0.030]	0.011 [0.024]	-0.005 [0.027]	0.030 [0.032]	0.022 [0.025]	0.001 [0.027]
45-54 years						
55-64 years	0.054* [0.032]	0.024 [0.031]	0.011 [0.038]	0.070** [0.030]	0.041 [0.029]	0.022 [0.036]
65-74 years	-0.008 [0.039]	-0.045 [0.046]	-0.091* [0.046]	0.037 [0.038]	0.001 [0.040]	-0.061 [0.042]
Over 75 years	-0.035 [0.051]	-0.122** [0.043]	-0.095* [0.055]	0.018 [0.045]	-0.064 [0.047]	-0.057 [0.061]
No Schooling						
Primary/Middle School	0.043 [0.041]	0.046 [0.037]	-0.004 [0.041]	0.046 [0.040]	0.053 [0.036]	0.000 [0.040]
High School or more	0.086 [0.053]	0.103* [0.053]	0.075 [0.055]	0.078 [0.051]	0.095* [0.050]	0.07 [0.053]
Other Caste						
Schedule Caste	-0.007 [0.048]	0.028 [0.042]	0.008 [0.050]	0.002 [0.048]	0.032 [0.044]	0.011 [0.051]
Schedule Tribe	-0.034 [0.070]	-0.008 [0.054]	-0.031 [0.055]	-0.015 [0.069]	0.013 [0.056]	-0.017 [0.058]
Other Backward Caste	0.017 [0.035]	0.008 [0.033]	-0.004 [0.035]	0.029 [0.036]	0.013 [0.033]	0.001 [0.036]
Mortality Format						
Survival Format	0.028 [0.031]	0.057* [0.032]	0.125*** [0.034]	0.019 [0.031]	0.047 [0.032]	0.119** [0.035]
Both parents alive						
One or both parents are dead	-0.136** [0.049]	-0.102* [0.054]	-0.048 [0.046]	-0.148** [0.050]	-0.115** [0.047]	-0.055 [0.042]
Income-Well below Average						
Income - Below Average	0.090** [0.044]	0.028 [0.040]	-0.033 [0.045]	0.102** [0.043]	0.035 [0.040]	-0.026 [0.045]
Income - About Average	0.049 [0.041]	-0.006 [0.041]	-0.073* [0.041]	0.071* [0.038]	0.012 [0.043]	-0.061 [0.043]
Income - Well Off	-0.019 [0.065]	0.002 [0.057]	-0.028 [0.046]	-0.011 [0.066]	0.001 [0.060]	-0.027 [0.048]
Punjab						
Rajasthan	0.043 [0.068]	0.085 [0.060]	0.119** [0.051]	0.046 [0.068]	0.089 [0.060]	0.121** [0.051]
Kerala	0.124** [0.050]	0.097** [0.047]	0.068 [0.045]	0.191*** [0.052]	0.152** [0.050]	0.105** [0.050]
Karnataka	-0.124*** [0.035]	-0.080** [0.037]	-0.032 [0.043]	-0.119** [0.036]	-0.073** [0.036]	-0.029 [0.043]
Self Health-Very Good						
Self Health-Good				-0.061 [0.105]	-0.116 [0.108]	-0.081 [0.085]
Self Health-Fair				-0.149 [0.107]	-0.167 [0.114]	-0.119 [0.096]
Self Health-Poor				-0.240* [0.126]	-0.368** [0.129]	-0.214* [0.110]
Self Health-Very poor				-0.355** [0.137]	-0.309** [0.137]	-0.282* [0.143]
N	391	391	391	391	391	391

Table .8: Activity of Daily Living

<b>ADL Dimensions</b>	<b>Proportion of Yes</b>	<b>N</b>
Difficulty with dressing	5.64	319
Difficulty walking	6.58	319
Difficulty bathing or showering	4.08	319
Difficulty eating	5.33	319
Difficulty getting in or out of bed	8.15	319
Difficulty using toilet	5.02	319

Table .9: Association between SSE and objective measures of health

	<b>1-year survival</b>	<b>5-year survival</b>	<b>10-year survival</b>
Activity of Daily Life	0.030** [0.014]	0.027* [0.016]	0.008 [0.021]
N	319	318	313
High Blood Pressure	-0.041 [0.038]	-0.001 [0.034]	-0.035 [0.038]
N	309	307	304
Height	0.005** [0.002]	0.005** [0.002]	0.005** [0.002]
N	320	319	314

Each cell in the above table reports the results of separate estimations with all the control variables used in Table 7, columns 1 to 3

Table .10: Association with low haemoglobin concentrations

	<b>Female</b>			<b>Male</b>		
	<b>1-year survival</b>	<b>5-year survival</b>	<b>10-year survival</b>	<b>1-year survival</b>	<b>5-year survival</b>	<b>10-year survival</b>
Low Haemoglobin	0.058 [0.036]	0.051 [0.030]	0.072 [0.050]	-0.138** [0.062]	-0.167** [0.068]	-0.024 [0.074]
N	152	148	145	141	144	142

Each cell in the above table reports the results of separate estimations with all the control variables used in Table 7, columns 1 to 3

Table .11: Survival expectations, savings and outstanding bank loans

	Basic Reg			Savings	Basic Reg	
	Loans	Loans	Loans		Savings	Savings
1-year survival	0.116** [0.052]			-0.39 [0.356]		
5-year survival		-0.045 [0.054]			0.322 [0.361]	
10-year survival			-0.061 [0.038]			0.142 [0.317]
Male						
Female	-0.021 [0.040]	-0.02 [0.039]	-0.021 [0.039]	0.339 [0.206]	0.354* [0.208]	0.351 [0.218]
45-54 years						
55-64 years	-0.05 [0.038]	-0.044 [0.038]	-0.045 [0.038]	0.607** [0.280]	0.591** [0.286]	0.582** [0.285]
65-74 years	0.015 [0.047]	0.009 [0.047]	0.006 [0.047]	0.487* [0.256]	0.584** [0.262]	0.552** [0.256]
Over 75 years	-0.046 [0.058]	-0.058 [0.057]	-0.058 [0.058]	0.289 [0.567]	0.376 [0.542]	0.336 [0.546]
No Schooling						
Primary/Middle School	0.071** [0.035]	0.079** [0.037]	0.077** [0.037]	0.241 [0.265]	0.224 [0.263]	0.236 [0.271]
High School or more	0.031 [0.058]	0.046 [0.061]	0.045 [0.060]	0.757* [0.393]	0.722* [0.373]	0.746* [0.390]
Other Caste						
Schedule Caste	0.078 [0.048]	0.077 [0.047]	0.076 [0.047]	-1.051** [0.500]	-0.990* [0.545]	-0.981* [0.541]
Schedule Tribe	-0.005 [0.048]	-0.011 [0.048]	-0.012 [0.048]	-0.051 [1.400]	-0.222 [1.351]	-0.135 [1.336]
Other Backward Caste	0.033 [0.065]	0.034 [0.066]	0.033 [0.066]	-0.175 [0.403]	-0.18 [0.397]	-0.161 [0.402]
Income-Well below Average						
Income - Below Average	0.081* [0.042]	0.094** [0.043]	0.091** [0.043]	-1.093** [0.388]	-1.174** [0.407]	-1.142** [0.413]
Income - About Average	-0.012 [0.043]	-0.005 [0.041]	-0.01 [0.042]	-0.541* [0.297]	-0.559* [0.289]	-0.545* [0.283]
Income - Well Off	-0.028 [0.047]	-0.029 [0.046]	-0.031 [0.046]	-0.688 [0.460]	-0.713 [0.474]	-0.706 [0.467]
Punjab						
Rajasthan	0.009 [0.039]	0.018 [0.040]	0.021 [0.039]	-0.383 [0.334]	-0.365 [0.341]	-0.391 [0.340]
Kerala	0.342*** [0.059]	0.360*** [0.058]	0.360*** [0.059]	-0.071 [0.496]	-0.149 [0.473]	-0.135 [0.477]
Karnataka	0.042 [0.046]	0.025 [0.046]	0.026 [0.045]	-1.454*** [0.355]	-1.350*** [0.368]	-1.392*** [0.377]
N	391	391	391	129	129	129

Table .12: Difference between own survival and hypothetical person survival

	Basic Reg			Basic Reg + self health controls		
	1-year survival	5-year survival	10-year survival	1-year survival	5-year survival	10-year survival
Male						
Female	-0.012 [0.052]	0.051 [0.036]	0.048 [0.037]	-0.01 [0.049]	0.052 [0.036]	0.049 [0.039]
45-54 years						
55-64 years	0.005 [0.047]	0.029 [0.044]	0.018 [0.051]	0.018 [0.047]	0.032 [0.045]	0.023 [0.050]
65-74 years	0.035 [0.063]	0.019 [0.063]	-0.026 [0.061]	0.076 [0.068]	0.051 [0.065]	-0.022 [0.064]
Over 75 years	0.068 [0.065]	-0.087 [0.066]	-0.019 [0.070]	0.139** [0.067]	-0.05 [0.059]	-0.005 [0.072]
No Schooling						
Primary/Middle School	-0.01 [0.061]	0.007 [0.051]	-0.003 [0.054]	-0.006 [0.056]	0.02 [0.052]	-0.003 [0.053]
High School or more	0.059 [0.087]	0.062 [0.079]	0.048 [0.067]	0.052 [0.082]	0.046 [0.077]	0.055 [0.067]
Other Caste						
Schedule Caste	-0.04 [0.084]	0.05 [0.081]	0.043 [0.073]	-0.044 [0.069]	0.041 [0.081]	0.039 [0.072]
Schedule Tribe	-0.041 [0.077]	-0.021 [0.073]	0.023 [0.068]	-0.026 [0.071]	0.01 [0.070]	0.032 [0.069]
Other Backward Caste	0.061 [0.058]	-0.019 [0.056]	-0.03 [0.053]	0.06 [0.057]	-0.029 [0.053]	-0.033 [0.054]
Mortality Format						
Survival Format	-0.003 [0.044]	0.025 [0.033]	0.017 [0.039]	-0.018 [0.043]	0.021 [0.031]	0.012 [0.037]
Both parents alive						
One or both parents are dead	-0.074 [0.094]	-0.024 [0.087]	-0.035 [0.076]	-0.109 [0.094]	-0.043 [0.074]	-0.028 [0.070]
Income-Well below Average						
Income - Below Average	0.154** [0.064]	-0.003 [0.067]	-0.021 [0.069]	0.174** [0.058]	-0.002 [0.071]	-0.003 [0.068]
Income - About Average	0.088* [0.051]	-0.033 [0.072]	-0.089 [0.058]	0.111** [0.043]	-0.035 [0.074]	-0.072 [0.060]
Income - Well Off	-0.021 [0.064]	-0.033 [0.093]	-0.065 [0.077]	-0.033 [0.057]	-0.046 [0.094]	-0.06 [0.077]
Punjab						
Rajasthan	-0.061 [0.069]	0.033 [0.066]	-0.073 [0.053]	-0.034 [0.070]	0.026 [0.065]	-0.074 [0.058]
Kerala	0.023 [0.074]	0.055 [0.055]	-0.021 [0.063]	0.11 [0.076]	0.087 [0.073]	-0.022 [0.070]
Karnataka	-0.058 [0.062]	-0.084 [0.064]	-0.132** [0.052]	-0.028 [0.066]	-0.074 [0.066]	-0.122** [0.056]
Self Health-Very Good						
Self Health-Good				-0.510*** [0.061]	-0.11 [0.127]	-0.229** [0.093]
Self Health-Fair				-0.520*** [0.069]	-0.09 [0.142]	-0.219** [0.100]
Self Health-Poor				-0.743*** [0.117]	-0.336** [0.160]	-0.248* [0.140]
Self Health-Very poor				-0.768*** [0.187]	-0.216 [0.176]	-0.055 [0.126]
Cons	0.015 [0.102]	-0.004 [0.143]	0.092 [0.116]	0.518*** [0.090]	0.117 [0.154]	0.291** [0.140]
N	243	247	253	243	247	253