Longitudinal changes in self-reported health: Evidence from Albania [#]

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Abstract: This paper investigates the reliability of self-assessed measures of health using panel data collected in Albania by the World Bank from 2002 to 2004 through the Living Standard Measurement Study project. As the survey includes questions on the usual self-assessed measure of health and on more objective health problems, we combine both types of information to better understand how respondents revise their answers to the self-reported measures over time. The estimation of random effects ordered Probit equations provides two main results. First, differences in self-reported subjective health between individuals are much more important than those over time, suggesting a strong state dependence in subjective health status. Second, our empirical analysis sheds light on the coherence of respondents, both from a subjective and an objective viewpoint. Health evolution is influenced by more permanent shocks in health than by more transitory illness or injury.

Keywords: Albania, self-reported health, random effects ordered Probit

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1. Introduction

Many empirical studies rely on self-assessed measures to investigate overall individual health in population. Ordered answers to simple questions like 'how is your health in general?' or 'in general, would you say that your health is excellent, very good, good, fair or poor?' are known to be good predictors of either mortality, morbidity or use of medical care, as shown in McCallum *et alii* (1994), Idler and Kasl (1995) or Appels *et alii* (1996). With the use of ordered Probit models, Wagstaff and van Doorslaer (1994) explain how to construct a continuous, single health index from the categorical self-assessed variable, this index being strongly correlated with other health outcomes (Gerdtham *et alii*, 1999).

The self-reported measures of health status offer a number of potential advantages. First, self-assessed indicators are very easy to implement and they are widely collected in almost all countries. Second, individuals are expected to assign themselves relative weights to the different dimensions of health, which are then summarized in a single categorical variable. At the same time, self-reported measures face three critical limitations. The first one is how to measure health inequality with qualitative data. The second one deals with reporting heterogeneity in ordered response models, while the last one concerns the reliability of self-assessed health status.

The first problem lies in the measurement of inequalities. The categorical nature of self-assessed health status prevents from using traditional tools of distributional analysis. Simple methods based on an assignment of numerical values to the different categories of heath require an adequate scale, but a difficulty is that the evaluation of health inequality has to be independent of the choice of scale. Allison and Foster (2004) propose a median-based approach with a partial inequality ordering which indicates any increase in inequality when the data are qualitative.

A second difficulty is that different populations may use different threshold levels when being asked to assess their health. This is the so-called reporting heterogeneity problem further investigated in Kerkhofs and Lindeboom (1995), Shmueli (2003) and Lindeboom and van Doorslaer (2004) among others. For a given 'true' health status, individuals with different demographic and socio-economic background are expected to use different reference points when responding to the same questions. The detailed analysis of Lindeboom and van Doorslaer (2004) points out that reporting

heterogeneity may stem either from cut-point shift, *i.e.* all thresholds are shifted in parallel, or index shift, *i.e.* the thresholds are shifted in a dissimilar way[1].

A last crucial issue concerns the reliability of responses given to the self-reported measures of health. The question of interest is simply to know whether there is not much measurement error when individuals have to self-assess their own level of health. Since the self-reported measures are empirically strong predictors of objective health measures, it could be argued that measurement error remains scarce. Curiously, there are very few studies on this issue.

A noticeable exception is the contribution of Crossley and Kennedy (2002), who bring evidence on measurement error in self-reported health using Australian data. In their survey, a random sub-sample of respondents is asked twice about their self-reported health, respectively before and after giving answers to additional health related questions. Interestingly, 28% of respondents change their response. This suggests that measurement error is substantial, but it may also be that respondents have learned something about their health status between the first and second rounds of self-assessed questions[2].

The purpose of this paper is to further investigate the reliability of self-assessed measures of health. Instead of using cross-sectional data with repeated information on health status as in Crossley and Kennedy (2002), we argue that introducing dynamic aspects into the empirical analysis may be helpful to shed light on the relevance of health self-assessment. Indeed, a comparison of self-assessed health status at two different wages and the use of more objective shocks in health during the periods allows to indicate whether respondents revise or not in the appropriate direction their health status. Clearly, if the self-reported measure is concerned by significant changes not related to 'true' shocks, this suggests that the reliability of the ordered subjective outcome remains limited.

Surprisingly, little is known about the dynamics of self-assessed health, Contoyannis *et alii* (2004a, 2004b), Halliday (2007) and Jones *et alii* (2006) being recent exceptions. For instance, Contoyannis *et alii* (2004a) investigate the persistence

[1] Lindeboom and van Doorslaer (2004) propose a test for differential response behaviour across subgroups of population based on likelihood ratio tests.

[2] This learning process would be due to the fact that individuals respond between the first and second self-assessed health measures to a set of detailed questions related to their own health. See the further discussion in Crossley and Kennedy (2002).

in health outcomes using the British Household Panel Survey. Drawing on dynamics ordered Probit models, these authors seek to quantify the relative contribution of state dependence and heterogeneity in explaining the dynamics of health, the second component accounting for about 30 percent of the unexplained variation in health. Another central issue in their study is selective attrition, as attrition from the panel at each wave is expected to be strongly health-related (especially at older ages)[3]. That self-assessed health is characterized by a massive state dependence is a very important finding, as it means that short-term public policy aimed at improving health may have long-term benefits.

Nevertheless, a difficulty remains when interpreting the role of state dependence. Does it mean that 'true' health outcomes are very persistent over time at the individual level, or does it mean that some respondents are for instance very optimistic and claim at each wave that they are in very good health although they experience during the overall period some health problems? In this paper, we further study changes in self-reported health status over time and propose an empirical analysis using longitudinal data collected in Albania by the World Bank from 2002 to 2004. As the survey includes questions on the usual self-assessed measure of health and on more objective health problems, we combine both types of information to better understand how respondents revise their answers to the self-reported measures over time.

The use of longitudinal data allows us to further explore the three following issues. First, we analyse for the first-time the dynamics of self-reported health in a developing country. With respect to the case of developed countries (Contoyannis *et alii*, 2004a, Halliday, 2007), state dependence in health may be less pronounced in a poor country where people are much more sensitive to economic conditions. Secondly, we investigate the revision process over time of the self-assessed measure of health as a function of more objective health indicators and study whether respondents make coherent decisions or not. Thirdly, as respondents indicate whether their health status has improved or worsen during the last year, we compare this information with their two measures of self-reported health over the same period.

Our empirical analysis then extends the previous paper of Crossley and Kennedy (2002) about the reliability of self-assessed health. By introducing time into the study of

[3] Nevertheless, as shown in Contoyannis *et alii* (2004a), this survivorship bias does not really affect the estimates of state dependence and socioeconomic status.

self-reported health, we also add evidence to the recent and growing literature on panel analyses of self-reported health (Contoyannis *et alii*, 2004a, 2004b, Halliday, 2007). However, with respect to these authors, we do not estimate a dynamic panel model as we have only three waves. Our main results are that there is little variation over time in health status in Albania and that respondents provide fairly reliable information on their own health status and on how their health status changes over time.

The rest of this paper is organized as follows. Section 2 presents the LSMS data. It also provide descriptive statistics on self-reported health status in Albania over the 2002-2004 period and on state dependence in health using simple transition matrices. Econometric results based on the estimation of random-effects ordered Probit models and on decomposition techniques are extensively discussed in Section 3. Finally, Section 4 concludes.

2. The Albanian LSMS data

2.1. The LSMS Albanian data

Our empirical study of self-reported health uses data collected in Albania from 2002 till 2004 through the LSMS project (Living Standard Measurement Study). The aim of that project is to improve the quality of household survey data for policy needs, and it is a central tool in measuring poverty in many developing countries[4]. Albania has recently implemented important reforms towards a market economy following the collapse of communism. Although the GDP is increasing since 2000 (5% per year on average between 2000 and 2005), Albania still remains a poor country.

The GDP per inhabitant is low (2400 US dollars in 2003) and one in four Albanians live below the poverty line. The Human Development Index (HDI) (0.784) is below the average HDI of Eastern Europe (0.802), while unemployment (17% in 2004) and inflation (2.3% in 2004) remain high. So, Albania is characterized by strong poverty and lack of job opportunities. At the same time, the proximity of attracting neighboring countries (like Italy and Greece) offers some opportunities. Albania is now the largest emigration country in Europe (as a portion of the population). All these migrants play an important part in supporting the Albanian economy[5].

[4] For further details, see http://go.worldbank.org/IPLXWMCNJ0.
[5] A large proportion of the migrants' earnings is transferred back home (Korovilas, 1999). According to the World Bank, remittances amounts to 15 % of the GDP in Albania.

Our study relies on the Albanian LSMS longitudinal data and it covers the period from 2002 to 2004[6]. The first wave includes a nationally representative sample of households living in Albania and it is representative of both urban and rural areas. Information in 2002 was collected through the use of four questionnaires: a household questionnaire, a diary recording household consumption, a community questionnaire and a price questionnaire. In the following waves, the focus was only on the household questionnaire, with questions about composition of the household, dwelling, education, health, labour, migration, fertility, social assistance, consumption and anthropometrics among other things. Strong efforts have been made to maintain comparability of the different variables over time.

The size of the Albanian samples was respectively 1782 households (7973 individuals) in 2002, 2155 households (8110 individuals) in 2003, and 1797 households (8025 individuals) in 2004. In what follows, we are interested in the changes over time in self-reported health. We thus construct our sample in the following way.

First, we work at the individual level and select for each household all members who were at least 16 years old in 2002. Second, we follow these individuals over the three waves and keep only persons with information in 2002, 2003, and 2004. Since we use a balanced panel, we then do not account for the issue of survivorship bias, i.e. selective attrition related to poor health (see Contoyannis *et alii*, 2004a). Third, we delete missing values. We finally get a panel that comprises 12360 observations over the 2002-2004 period, meaning that we follow 4120 individuals per year.

Let us now briefly describe in more detail the main questions of interest related to the measurement of health. We mainly focus on the two following questions. The first one is the standard self-reported subjective health indicator: '*How would you rate your health condition? Very good, good, average, poor, very poor*'. The second one is an indicator about changes in health over time. '*Compared with health one year ago, would you say that your health now is? Much better now, somewhat better, about the same, somewhat worse, much worse*'. Also, the survey includes a few more objective health indicators. For instance, we know whether each individual has suffered from a chronic illness or disability that has lasted more than 3 months or had any illness or injury during the last 4 weeks.

[6] The survey was conducted by the Albanian Institute of Statistics, with assistance of the World Bank.

As we have longitudinal data, we are then able to study changes in self-reported health, by comparing answers at successive years. This comparison will shed light on the persistence of the health outcome over time. By combining the different questions, we are also able to study whether respondents adequately revise their subjective health outcome when they experience negative health experiences like illness or disability. Finally, note that we have two different measures of health evolution over time. One way consists in comparing the self-reported outcome in *t* and *t*-1, the other way is the retrospective question in *t* on evolution since last year.

2.2. The pattern of self-reported health in Albania

Answers given to the self-reported measure of health are reported in Table 1 for the three waves. Interestingly, very similar patterns are found in 2002, 2003 and 2004, which suggests that economic conditions have not really changed during the period. About 10% of the respondents claim that their health condition is either 'poor' or 'very poor', while 20% of them indicate an 'average' health. The bulk of individuals rate their health condition as either 'good' (between 41% and 43%) or 'very good' (between 26% and 28%).

Insert Table 1

The pattern of self-reported health is somewhat different when working respectively on the male and female subsamples. As shown in Table 1, women are more likely than men to claim that their health condition is 'poor' or 'average'. When adding these two categories, the corresponding proportion is equal to 27% for men in 2002, while it amounts to more than 35% for women. At the same time, women are less likely to indicate a 'very good' health, the gap between men and women being on average equal to 5 points of percentage. Gender differences in self-reported health may stem from differences in the observable characteristics of men and women.

In Table A of the Appendix, we present descriptive statistics related to the main covariates introduced into the multivariate analysis. On average, the proportion of women being less than 25 (and also from 25 to 34 years old) is higher than that of young men. This particular pattern is essentially due to the fact that we analyse health at the family level[7]. Co-residence is itself an endogenous process, young men being more

[7] Recall that we include all respondents living in the same housing.

likely to leave the parental home for instance. The proportion of married men is also higher, and women are less likely to reach high levels of educations (see Picard and Wolff, 2008). As expected, there are fewer differences for religion and also for income variables, either current level of food consumption or position on an income ladder. These various characteristics are expected to strongly influence the pattern of self-reported health.

One of the most influential explanatory variables is undoubtedly age, older people being more likely to be in bad health. As shown in Figure 1, the proportion of men younger than 25 claiming that their health condition is 'very poor' or 'poor' is extremely low, less than 2%. The same health outcome is reported by around 30% of older men (65 and above), and older women are even more likely to self-assess their health as poor (43%). Differences in health by gender are also observed among the highest category. While young women and men (less than 25) equally indicate a 'very good' health condition, respectively 55% and 56%, the gap then strongly widens with age. That outcome is quoted by 46% of men instead of 39% of women among the 25-34 age group, and even 36% instead of 22% for the 35-44 age group[8]. We further investigate the differences in health by gender when turning to the econometric analysis.

Insert Figure 1

That a similar profile of self-assessed health is found for the three waves does not necessarily imply that health remains constant at the individual level. Consider for instance the case of the 'very good' health outcome. With a kind of permanent health status, then around one-quarter of the pooled sample (i.e. individuals with three year-observations) should report a 'very good' health status. In fact, this prediction is absolutely not borne out by the LSMS data since only 11% of the individuals (455 respondents among 4120) rate their health condition as 'very good' over the 2002-2004 period. In a similar way, the proportion of respondents who always indicate a 'good health' amounts to 15.7%[9].

[8] The gap is then lower for older age groups, since it amounts to 9% for the 45-54 group, 7% for the 55-64 group, and only 1% for the older age group.

[9] Similar calculations respectively for the 'average' and 'poor/very poor' status lead to proportions which are respectively equal to 4.3% and to 3.7%. However, the proportion of individuals indicating an 'average' health condition is about twice higher, This suggests that people in poor health are much more likely to stay in poor health (perhaps owing to permanent disabilities), while the 'average' category is a much more versatile situation.

To further assess the importance of state dependence, we describe in Table 2 the pattern of self-reported health in wave *t* (either 2003 or 2004) as a function of self-reported health in wave t-1 (respectively 2002 and 2003). As women and men face different health conditions, the transition matrices of self-assessed health are calculated by gender. The main results are as follows.

Insert Table 2

First, there is considerable evidence of state dependence both for women and men. For that purpose, we calculate the proportion of respondents who indicate the same health condition over two successive years (either 2002 and 2003, or 2003 and 2004). More than one half of individuals give the same answer in waves *t*-1 and *t*, respectively 55.7% for men and 55.2% for men. Second, the measures of state dependence are higher at the top than at the bottom of the health ladder. Among men, 61.6% of those who are in 'very good' health in *t* were also in 'very good' health in *t*-1. This proportion is 58.5% for the 'good' outcome, but it only amounts to 53.3% for the 'poor/very poor' outcome and even 40.3% for the 'average' status. Third, changes in self-assessed health remains most often limited. Among the men who are in 'very good' health in *t*, around 95% of them were either in 'good' (33.6%) or 'very good' (61.6%) health in *t*-1.

2.3. Retrospective changes in self-assessed health

We now turn to self-reported changes in health condition over time. In the survey, respondents have to assess whether their health is now 'better', 'about the same' or 'worse' compared with health one year ago. This information is helpful to further understand how persistent health status is in Albania.

As shown in Figure 2, most respondents claim that their health condition is about the same in *t* and *t*-1. Among the male population, the corresponding proportion is equal to 65.9% in 2002, 80.2% in 2003 and 77.1% in 2004[10]. Interestingly, individuals in Albania are more likely to report that their health is nowadays better than worse compared with health one year ago. The ratio of the 'better health' outcome over the 'worse health' outcome amounts to around 3 for men, but it is much lower among women: it is comprised between 1.6 in 2003 and 2 in 2002.

[10] Very similar results are found for women, the proportions being respectively equal to 66.3% in 2002, 78.2% in 2003 and 74.8% in 2004.

Insert Figure 2

Two comments are in order. First, it is a little bit surprising to note that respondents have on average a much more positive feeling about the change in their health condition. An explanation could be that we use a balanced panel, so that people whose health strongly worsens over the successive years have a lower probability to be included in the selected sample. At the same time, it may be that respondents are reluctant to admit that their health status is going down and hence they could be tempted to overstate their true change in health condition.

Second, the differences that are observed across the different waves are really striking. In 2002, people are much more likely to report that their health status has changed since last year. Interestingly, 2002 is the first wave of the survey and it seems that respondents have more difficulties to answer the questions related to the health situation one year ago. In 2003 and 2004, the situation is different, as respondents have provided detailed information on their health condition, respectively in the 2002 and 2003 waves. Following the discussion in Crossley and Kennedy (2002), an interpretation is that in the last two waves, respondents have learned more about their own health status and they are then in a better position to self-assess their changes in health since last year.

The longitudinal dimension of the data allows us to further investigate changes in health over time. Specifically, we wonder whether answers given to change in health since last year are coherent or not with information given on health status at the different waves. Imagine for instance that a respondent indicates a good health status both in 2002 and 2003. If the subjective answers given by this interviewee are coherent, then she should claim in 2003 that compared to 2002, her health is 'about the same'. But if she reports an 'average' health in 2004, she should explain at that time that her health condition has worsened since 2003. Results of the comparison are in Table 3.

Insert Table 3

Clearly, the various measures of change in self-reported health over time differ. When using the retrospective information, respondents most often indicate that their health condition is about the same since last year, respectively 78.7% for men and

76.5% for women when pooling the 2003 and 2004 waves[11]. However, if we compare their self-reported health respectively in *t* and *t*-1, we find that only 55.9% of men and 55.2% of women have indeed chosen the same outcome at both waves. In fact, among the male group, 21% of respondents have reported in *t* a lower health condition than in *t*-1, while 23.1% have reported a better health in *t*. Hence, this casts some doubt on the coherence of the retrospective and contemporaneous self-assessed measures of health.

At the same time, the above discrepancy may be due to the inaccuracy of the definition of the median category, *i.e.* 'same health' since last year. Answers are indeed much more coherent when respondents claim that their health has either worsen or improved during the last twelve months. Among the men who report that their health has worsen since last year, 45.6% of them have indeed given a poorer health status in *t* with respect to *t*-1, while only 8% of them have reported a better health condition in *t*. When turning to the case of a better health since last year, we get similar findings: 25.3% of the male respondents indicate a better health status in *t* than in *t*-1, 58.3% report the same outcome, but there is still a significant proportion of men who report a poorer status (16.3%)[12].

As we also have more objective indicators of health in the survey, we can further study whether individuals revise their subjective status in a way that is consistent with objective changes in health. If for instance a person reports a chronic illness in *t*, but not in *t*-1, then she should be more likely to claim that her health has worsen since last year. In Table 4, we analyse the relationships between self-reported changes in health and the following health problems: chronic illness or disability longer than 3 months, illness or injury during the last 4 weeks, and hospital stay in the last 12 months.

Insert Table 4 here

Let us first focus on chronic illness or disability longer than 3 months: 73.3% of the male respondents were not concerned by such symptom both in *t*-1 and *t*, and 13.8% had reported such illness in both years. Now, 7.1% had no disability in *t*-1, but were ill in *t*. For this subsample, 72.5% of them report a self-rated health worse in *t* than in *t*-1 (the proportion is 65% among women). Conversely, among those who were ill in *t*-1,

[11] By definition, we cannot use the 2002 wave since we have only one measure of change in health since one year, this information being given by the retrospective question.

[12] As shown in Table 3, there is no significant difference by gender when comparing the two measures of changes in health over time.

but not in *t*, we find that most of them (70.4%) indicate a better health in *t* than in *t*-1 (67.3% among women). These findings suggest that the self-reported measure of health is rather reliable, as respondents seem to revise in the appropriate way their health outcome. If they experience a disability or chronic illness, then they most often argue that their health has worsened at the next wave.

At the same time, results from Table 4 also show that the self-reported measure is much less sensitive to more transitory shocks or stays in hospitals. Consider the case of illness or injury, during the last four weeks. Among those who report such illness in *t*, but did not in *t*-1, only 48.1% of men and 35.7% of women have a self-rated measure lower in *t* than in *t*-1. In such a situation, women are in fact more likely to have the same health outcome in both waves (51.4%). Similar findings hold when people were ill or injured in *t*-1, but are no longer in *t*. About 43% of them report a higher outcome in *t*, but also 43% of them have the same self-reported health in both years[13]. This suggests that the self-assessed measure of health depends much more on permanent shocks (chronic illness, disability) than on transitory events (illness, injury).

3. Econometric analysis

3.1. A random effects ordered Probit specification

We have an ordered categorical indicator for the self-reported health. Let us define by H the health measure, so that we have $H = 1$ when health is 'poor', $H = 2$ when health is 'average', $H = 3$ when health is 'good' and $H = 4$ when health is 'very good'. We suppose that there exists a continuous latent variable H^* for the health outcome. Given the four cases for health, we assume that $H^* \leq \mu_1$ when $H = 1$, $\mu_1 < H^* \leq \mu_2$ when $H = 2$, $\mu_2 < H^* \leq \mu_3$ when $H = 3$, and $\mu_3 < H^*$ when $H = 4$. The threshold level μ_1 is normalized to 0.

The latent indicator is expected to depend on a set of individual characteristics X, a vector of coefficients β and a residual. As we have repeated information over time for each individual in the survey, we account for an unobserved individual effect in the following way:

$$H_{it}^* = \beta' X_{it} + \delta_i + \varepsilon_{it} \qquad (1)$$

[13] Findings are very similar when considering hospital stay in the last 12 months.

where i and t as subscripts refer respectively to the respondent and to the year of survey. In (1), δ_i is an unobserved individual effect, and we assume that these perturbations δ_i are normally distributed with mean 0 and variance σ_δ^2. The error terms ε_{it} are also supposed to follow a normal distribution with mean 0 and we normalize the variance of this unexplained component to 1. We also assume that X, δ and ε are independent. The corresponding model is then a random effects ordered Probit model and the different threshold levels μ_j have to be estimated jointly with the vector of coefficients β [14].

The contribution to the likelihood function for an individual i observed during T periods is :

$$\Pr(H_{i1},...,H_{iT}) = \int_{-\infty}^{+\infty} \left(\Phi(\mu_{j+1} - \beta' X_{it}) - \Phi(\mu_j - \beta' X_{it})\right) \phi(\delta_i) d\delta_i \qquad (2)$$

where $\phi(\delta_i)$ is the density of $N(0,\sigma_{\delta_i}^2)$. The likelihood function for the above model involves multivariate normal integrals, so that the random effect ordered Probit model has to be estimated using numerical approximations and Gaussian quadrature techniques (Butler and Moffitt, 1982). The key assumption here is that the unobserved individual effects are uncorrelated with the different explanatory variables introduced into the regression (assumption of exogeneity).

One of our interests is to measure the persistence of health status over time. As we have only three waves with the Albanian panel, we cannot estimate a dynamic ordered model as in Contoyannis *et alii* (2004a) and Halliday (2007). We rely instead on a variance decomposition to estimate the between and within components of both the explained and unexplained variances following the method described in Picard and Wolff (2008). While the between component is related to difference among individuals, the within component of the variance sheds light on inequalities in self-reported health over time. To decompose the variance, we proceed in the following way.

For each respondent, we estimate the random effects ordered model and compute the linear fitted value of the latent variable given by $\hat{H}_{it}^* = \hat{\beta}' X_{it}$. This predicted value may be interpreted as a continuous propensity to be in good health.

[14] The different threshold levels are supposed to be constant across individuals.

Then, we compute the mean of these fitted values $\hat{H}_i^*$ at the individual level and we also create the new variable $\hat{H}_{it}^d = \hat{H}_{it}^* - \hat{H}_i^*$. The latter is a measure of heterogeneity over time for a given individual. Finally, we compute the between explained variance $V(\hat{H}_i^*)$ and the within explained variance $V(\hat{H}_{it}^d)$. In addition, we have $V(\delta_i) = \sigma_\delta^2$ and $V(\varepsilon_{it}) = 1$, which are the variances of respectively the unexplained between and within components.

This decomposition method provides an accurate measure of the weight of the explained and unexplained components of the latent measure of health. A large within component simply indicates that the health outcome varies strongly over time.

3.2. The determinants of self-reported health

We now turn to the determinants of self-reported health. When estimating the ordered Probit model, we introduce into the regression the following covariates: gender, age, marital status, number of children (by age groups), level of education, religion, urban-rural status, and household resources. As we do not have an accurate measure of income over the three years, we rely on the following indicators. The first one is about the current level of expenditure of the family for food and other basic necessities like clothing and housing (either more than adequate, just adequate, or less than adequate). The second one is the position on a 10-step-ladder where on the bottom (first step) stand the poorest people and on the highest step (tenth step) stand the richest people[15].

Insert Table 5 here

As shown in column 1 of Table 5, a first finding is that the self-reported health outcome depends on gender. At the 1 percent level, self-assessed health is lower for women than for men. This could be due to the fact that women are more frequently involved in painful, domestic tasks. So, in the sequel, we have also estimated gender-specific regressions. As they grow older, individuals are more likely to report a poor health status. We observe from the data that the deterioration in self-reported health is not regular over time. People seem to suffer from a more severe decrease in their subjective health when they reach 65 and to a lesser extent 55.

[15] As these two indicators of resources are highly correlated, we choose to estimate two regressions for each subsample.

Marital status also influences the health outcome. Individuals who are single have in average a better subjective health status than married respondents, while the effect is reversed for divorced or widowed respondents who are more likely to be in poor health. These results may stem from the fact that age and marital status are strongly correlated in our sample, as most children of the head living in the household are single. A striking result is that the number of children aged between 5 and 11 years positively affects self-assessed health. An explanation could be that those children are most often enrolled in primary school and the corresponding investment in human capital remains somewhat low, so that other individuals may benefit from more time and financial resources within the household.

When turning to education, we find that more educated individuals have on average better outcomes for self-assessed health. On the one hand, people with more education have also more knowledge about health. On the other hand, education is strongly related to permanent income, meaning that it will pick up part of the resources effect. However, we note that the influence of education is not linear. Health is strongly improved when household members have at least the primary 8 years level, but differences are not really significant between vocational, secondary school and graduate or postgraduate studies.

As shown in Table 5, the self-reported health measure is indeed increasing with income. When the head of the household indicates that the current level of expenditure for food and basic necessities is not adequate, then the health outcome is strongly reduced, especially when these expenditures are less than adequate (column 1). In column 2, we evidence a positive relationship between the dependent variable and the position on the income ladder, meaning that richer individuals are more likely to be in better health. Finally, two interesting results are that individuals living in an urban area declare in average a better health status than those living in a rural area and the self-assessed health outcome is worse for non-Muslim individuals[16].

As shown in columns (3), (4), (5) and (6) of Table 5, there are a few gender differences in the effect of individual characteristics. Women living either as single, divorced or widowed are much more likely to be in poor health, while the effect of divorce or widowhood is hardly significant among men. While household resources

[16] Differences in health outcome between rural and urban areas essentially stem differences in supply of health services, distance to doctors and hospitals being larger for instance in poor rural areas.

influence in the same way the self-reported health of men and women, we note that the improving effect of education on health is more pronounced for women (especially for secondary or university diploma). Finally, both Muslim men and Muslim women report more likely a worse health, but this phenomenon is only statistically significant in the female subsample.

For the various regressions, we perform a decomposition of the explained and unexplained variance and indicate the weights of the between and within components in Table 5. As shown in column (1), we explain 36.5% of the total variance. However, much of the explained variance is due to differences between individuals (the variance component amounts to 35.7%), while the within variance is very low (0.8%). As far as the unobserved variance is considered, we find that the between and within components of the variances are of similar order of magnitude, respectively 29.3% and 34.1%. Conclusions from this decomposition are twofold.

First, differences in self-reported subjective health between individuals are much more important than those over time. The within variance is approximately equal to one-third of the total variance, which is evidence of a strong state dependence in health in Albania. Variability in health essentially stems from differences in health among individuals in that country. Second, the demographic and socio-economic characteristics introduced into the regression do not really explain the changes in the self-assessed measure of health over time.

We have also performed the decomposition separately for men and women. The weight of the explained variance is slightly lower among men, about 33% instead of 40%, but both for men and women the within component remains extremely low (1%). At the same time, the within unexplained component is slightly higher than the between unexplained component (see Table 5)[17].

4.3. Explaining changes in self-reported health

We finally investigate the determinants of the question about health evolution since previous year. In particular, we study whether answers given by individuals to this

[17] We have also estimated additional regressions respectively on rural and urban subsamples and on subsamples by religion (Muslim and non Muslim groups). For these different subsample, we always get a very low value for the explained within component and find approximately equal weights for the between and within unexplained components.

retrospective question are consistent with both their changes in self-reported health and the more objective health problems that they report. As most respondents claim that their health has not changed (73.8%), we choose to group the 'much worse' and 'somewhat worse' outcomes (8.1%) and the 'somewhat better' and 'much better' answers (18.2%). We then get an ordered indicator, equal to -1 when health is worse, 0 when health has not changed, and 1 when health is better. Since we have repeated information for all individuals, we again turn to random effects ordered Probit models.

Insert Table 6 here

The various estimates presented in Table 6 are on the whole coherent with those of Table 5. As shown in column (1), women are more likely than men to report that their subjective health has deteriorated since last year. Health evolution is negatively correlated with age, this negative effect being large over 65 years. Divorced or widowed individuals also report more often a worsened health evolution compared with married people, while there is no significant difference between single and married individuals. Health evolution is correlated with the number of children aged between 5 and 11 years, and especially with the number of children between 12 and 18 years. Better economic conditions also positively affect health evolution, as shown by the positive coefficients of the various educational dummies and the position on the income ladder. Finally, health evolution is slightly better for people living in an urban area and for Muslim individuals.

We have also attempted in Table 6 to assess the robustness of the various measures of health that are available in the Albanian questionnaire. In order to know whether answers to health evolution are coherent with answers to self-reported health, we construct two dummies indicating a self-reported health worse in *t* than in *t*-1 and a self-reported health better in *t* than in *t*-1. The first dummy variable is expected to be negatively correlated with health evolution, while the correlation should be positive in the second case. The results reported in column (2) of Table 7 are consistent with our expectations[18]. Individuals whose self-reported health outcome is lower in *t* than in *t*-1 more often claim that their health has deteriorated since last year, while those with a

[18] As we have information on self-reported health in 2002, 2003 and 2004, this means that we exclude from the sample data from 2002 when studying health evolution. In 2003, we are able to study the determinants of health evolution since 2002 and account for changes in self-reported health between 2002 and 2003. In 2002, we have by definition no information on self-reported health in 2001.

better self-reported health outcome in *t* than in *t*-1 more often claim that their health has improved since last year.

Another result in favour of the reliability of our dependent variable is that health evolution strongly depends on negative shocks in health. In column (3) of Table 6, we introduce two additional regressors related to more objective health problems present in *t*-1, *i.e.* existence of chronic illness or disability longer than 3 months and illness or injury during the last 4 weeks. Our estimates show that health evolution is worse when respondents had a chronic illness or disability, while the impact of illness or injury is of much lower magnitude and not significant at conventional level. An interpretation is that the subjective measure of health evolution is influenced by more permanent shock in health than by more transitory illness or injury.

Columns (4), (5), (6) and (7) of Table 6 report estimates from gender-specific regressions. Let us briefly discuss the results. First, the negative effect of age on health evolution is less important for women than for men, especially at older ages. Secondly, both men and women have an appreciation of their health evolution that is consistent with answers given to self-reported health. Nevertheless, we observe that men who have a self-reported outcome in *t* worse than in *t*-1 have a proportionally higher intensity to claim that their health has deteriorated since last year. Thirdly, chronic illness and disability have a negative influence both for men and women, but illness or injury are negatively correlated with health evolution only for women at the 10 percent level.

4. Conclusion

While it is well known that self-reported measures of health status are strong predictors of true health, there is curiously little empirical evidence on the dynamics of self-assessed health. In this paper, we further explore the reliability of this indicator drawing on a panel analysis of self-reported health. In particular, we focus on how respondents revise their answers to the self-reported measures over time and how the subjective measures of self-assessed health and health evolution are sensitive to more objective health shocks. For our empirical study, we use data collected in Albania by the World Bank over the 2002-2004 period. Our main results are as follows.

First, the self-reported measure of health and its improvement over time are positively correlated with education, income and with the fact of living in an urban area.

Secondly, men report better self-reported health outcomes and a better health evolution than women, but there are few gender differences in the impact of individual characteristics. Thirdly, results from a variance decomposition shows that the explained variance is mainly due to differences between individuals (35.7%). The very low value for the within variance suggests a strong inertia in subjective health status. Finally, improvement in self-reported health is negatively correlated with objective indicators of health deterioration, like the fact of suffering from a chronic illness or disability, while transitory illness or injury play a less significant role. All these results clearly show that respondents provide reliable information on their own health status and on how their health status changes over time in Albania.

References

Allison R.A., Foster J.E., (2004), "Measuring health inequality using qualitative data", *Journal of Health Economics*, vol. 23, pp. 505-524.

Appels A., Bosma H., Grabauskas V., Gostautas A., Sturmans F., (1996), "Self-reported health and mortality in a Lithuanian and a Dutch population", *Social Science and Medicine*, vol. 42, pp. 681-689.

Butler J.S., Moffitt R., (1982), "A computationally efficient quadrature procedure for the one factor multinomial Probit model", *Econometrica*, vol. 50, pp. 761-764.

Contoyannis P., Jones A.M., Rice N., (2004a), "The dynamics of health in the British Household Panel Survey", *Journal of Applied Econometrics*, vol. 19, pp. 473-503.

Contoyannis P., Jones A.M., Rice N., (2004b), "Simulation-based inference in dynamic panel Probit models: An application to health', *Empirical Economics*, vol. 29, pp. 49-77.

Crossley T.F., Kennedy S., (2002), "The reliability of self-assessed health status", *Journal of Health Economics*, vol. 21, pp. 643-658.

Gerdtham U.G., Johannesson M., Lundberg L., Isacson D., (1999), "A note on validating Wagstaff and van Doorslaer health measure in the analysis of inequality in health", *Journal of Health Economics*, vol. 18, pp. 217-224.

Halliday T.J., (2007), "Testing for state dependence with time variant transition probabilities", *Econometric Reviews*, vol. 26, pp. 685-703.

Idler E., Kasl S., (1995), "Self-ratings of health: Do they also predict change in functional ability?", *Journal of Gerontology: Social Science*, vol. 50B, pp. S344-S353.

Jones A.M., Rice N., Contoyannis P., (2006), "The dynamics of health", in A.M. Jones(ed.), *The Elgar Companion to Health Economics*, Aldershot, Edward Elgar, pp. 17-25.

Kerkhofs M., Lindeboom M., (1995), "Subjective health measures and state dependent reporting errors", *Health Economics*, vol. 4, pp. 221-235.

Korovilas J., (1999), "The Albanian economy in transition: The role of remittances and pyramid investment schemes", *Post-Communist Economies*, vol. 11, pp. 399-415.

Lindeboom M., Van Doorslaer E., (2004), "Cut-point shift and index shift in self-reported health", *Journal of Health Economics*, vol. 23, pp. 1089-1089.

McCallum J., Shadbolt B., Wang D., (1994), "Self-rated health and survival: 7 years follow-up study of Australian elderly", *American Journal of Public Health*, n° 847, pp. 1100-1105.

Picard N., Wolff F.C., (2008), "Measuring educational inequalities: A method and an application to Albania", *Journal of Population Economics*, forthcoming.

Shmueli A., (2003), "Socio-economic and demographic variation in health and its measures: The issue of reporting heterogeneity", *Social Science and Medicine*, vol. 57, pp. 125-134.

Wagstaff A., van Doorslaer E., (1994), "Measuring inequalities in health in the presence of multiple-category morbidity indicators", *Health Economics*, vol. 3, pp. 281-291.

Table 1. Descriptive statistics on self-reported health

Self-reported health	(%)	2002	2003	2004
All (N=12320)				
'Poor'		10.9	10.6	9.9
'Average'		20.5	19.3	21.0
'Good'		42.5	43.2	41.3
'Very good'		26.1	26.9	27.8
Men (N=6231)				
'Poor'		8.0	8.7	8.6
'Average'		19.0	16.8	18.3
'Good'		44.7	44.7	42.6
'Very good'		28.2	29.9	30.6
Women (N=6129)				
'Poor'		13.8	12.6	11.2
'Average'		21.9	22.0	23.7
'Good'		40.2	41.6	40.1
'Very good'		24.0	23.8	25.0

Source: Albanian LSMS 2002-2003-2004.

Table 2. Transition matrices of self-reported health

A. Men

Self-reported health In wave *t*-1	Self-reported health in wave *t*				All
	Poor	Fair	Good	Very good	
Poor	4.4	2.5	1.1	0.3	8.4
Fair	2.4	7.2	6.6	1.7	17. 9
Good	1.5	6.6	26.2	10.4	44.7
Very good	0.2	1.2	9.7	17.9	29.1
All	8.6	17.5	43.6	30.3	100.0

B. Women

Self-reported health In wave *t*-1	Self-reported health in wave *t*				All
	Poor	Fair	Good	Very good	
Poor	7.0	4.2	1.8	0.3	13.2
Fair	3.3	10.2	7.2	1.3	21.9
Good	1.4	7.4	23.6	8.4	40.9
Very good	0.2	1.1	8.3	14.3	23.9
All	11.9	22.9	40.9	24.4	100.0

Source: Albanian LSMS 2002-2003-2004.

Table 3. Measures of change in health status over time

A. Men

Comparison of self-reported health between t and t-1	Compared with health one year ago			Number of observations
	Worse health	Same health	Better health	
Health in t worse than health in t-1	2.6	16.5	2.6	902
Health in t same than health in t-1	2.7	44.0	9.1	2315
Health in t better than health in t-1	0.5	18.2	4.0	937
Number of observations	239	3267	648	4154

B. Women

Comparison of self-reported health between t and t-1	Compared with health one year ago			Number of observations
	Worse health	Same health	Better health	
Health in t worse than health in t-1	3.2	15.9	2.6	887
Health in t same than health in t-1	4.8	42.2	8.1	2254
Health in t better than health in t-1	0.7	18.4	4.1	945
Number of observations	354	3126	606	4086

Source: Albanian LSMS 2002-2003-2004.

Table 4. Measures of subjective and objectives changes in health

A. Men

Objective problems	Change in self-reported health			Frequency (%)
	Health in t worse than health in t-1	Same health in t and t-1	Health in t better than health in t-1	
Chronic illness or disability longer than 3 months				
No in t-1, no in t	18.8	60.5	20.8	73.3
Yes in t-1, yes in t	19.2	59.8	21.0	13.8
No in t-1, yes in t	72.5	23.1	4.4	7.1
Yes in t-1, no in t	3.3	26.3	70.4	5.9
Illness or injury during the last 4 weeks				
No in t-1, no in t	20.9	57.7	21.4	85.1
Yes in t-1, yes in t	14.1	64.1	21.9	1.5
No in t-1, yes in t	48.1	39.7	12.2	5.7
Yes in t-1, no in t	13.2	43.7	43.1	7.7
Hospital stay in the last 12 months				
No in t-1, no in t	21.2	56.3	22.5	93.7
Yes in t-1, yes in t	14.3	57.1	28.6	0.7
No in t-1, yes in t	47.7	42.2	10.2	3.1
Yes in t-1, no in t	12.5	49.0	38.5	2.5

B. Women

Objective problems	Change in self-reported health			Frequency (%)
	Health in t worse than health in t-1	Same health in t and t-1	Health in t better than health in t-1	
Chronic illness or disability longer than 3 months				
No in t-1, no in t	19.4	59.6	21.1	64.6
Yes in t-1, yes in t	16.9	61.6	21.5	19.4
No in t-1, yes in t	65.0	30.0	5.0	8.7
Yes in t-1, no in t	3.4	29.3	67.3	7.3
Illness or injury during the last 4 weeks				
No in t-1, no in t	21.4	57.2	21.4	77.3
Yes in t-1, yes in t	15.8	57.2	27.0	3.7
No in t-1, yes in t	35.7	51.4	12.9	8.9
Yes in t-1, no in t	13.8	42.5	43.7	10.1
Hospital stay in the last 12 months				
No in t-1, no in t	21.5	56.1	22.4	90.6
Yes in t-1, yes in t	14.3	66.7	19.1	1.0
No in t-1, yes in t	33.0	50.3	16.8	4.2
Yes in t-1, no in t	16.6	36.7	46.8	4.1

Source: Albanian LSMS 2002-2003-2004.

Table 5. Random effects estimates of self-reported health

Explanatory variables		All		Men		Women	
		(1)	(2)	(3)	(4)	(5)	(6)
Female		-0.346***	-0.355***				
		(9.28)	(9.66)				
Age	25 – 34	-0.349***	-0.315***	-0.295***	-0.251**	-0.381***	-0.354***
(ref : Less than 25)		(4.55)	(4.16)	(2.70)	(2.31)	(3.53)	(3.32)
	35 – 44	-0.795***	-0.780***	-0.663***	-0.635***	-0.910***	-0.899***
		(9.52)	(9.44)	(5.52)	(5.35)	(7.73)	(7.74)
	45 – 54	-1.172***	-1.173***	-1.038***	-1.036***	-1.275***	-1.275***
		(13.36)	(13.52)	(8.34)	(8.41)	(10.30)	(10.44)
	55 – 64	-1.737***	-1.732***	-1.660***	-1.632***	-1.793***	-1.807***
		(18.48)	(18.65)	(12.46)	(12.39)	(13.51)	(13.79)
	65 and above	-2.347***	-2.352***	-2.392***	-2.388***	-2.258***	-2.269***
		(22.91)	(23.22)	(16.92)	(17.06)	(15.05)	(15.32)
Single		0.412***	0.423***	0.272***	0.288***	0.540***	0.549***
		(5.57)	(5.79)	(2.63)	(2.82)	(5.07)	(5.23)
Divorced or widowed		-0.212***	-0.177**	-0.316*	-0.252	-0.182**	-0.154*
		(2.67)	(2.25)	(1.83)	(1.47)	(1.98)	(1.70)
Number of children 0-4		0.022	0.025	0.002	0.006	0.028	0.031
		(0.71)	(0.81)	(0.05)	(0.14)	(0.63)	(0.69)
Number of children 5-11		0.081***	0.093***	0.068**	0.082**	0.075**	0.085***
		(3.55)	(4.12)	(2.09)	(2.55)	(2.28)	(2.63)
Number of children 12-18		0.017	0.028	-0.024	-0.006	0.048*	0.053*
		(0.84)	(1.43)	(0.85)	(0.23)	(1.65)	(1.85)
Diploma	Primary 8 years	0.522***	0.494***	0.427***	0.397***	0.616***	0.588***
(ref: None)		(8.98)	(8.64)	(5.24)	(4.95)	(7.36)	(7.14)
	Vocational	0.700***	0.619***	0.591***	0.510***	0.782***	0.695***
		(9.67)	(8.66)	(6.09)	(5.32)	(7.10)	(6.40)
	Secondary	0.882***	0.813***	0.765***	0.690***	0.971***	0.903***
		(11.95)	(11.15)	(7.50)	(6.85)	(8.98)	(8.47)
	University	0.911***	0.796***	0.752***	0.633***	1.053***	0.935***
		(10.47)	(9.23)	(6.62)	(5.63)	(7.56)	(6.77)
Muslim		-0.122***	-0.132***	-0.082	-0.092	-0.151**	-0.162***
		(2.76)	(3.05)	(1.30)	(1.47)	(2.47)	(2.70)
Urban		0.264***	0.225***	0.250***	0.212***	0.289***	0.250***
		(6.67)	(5.79)	(4.54)	(3.92)	(5.08)	(4.48)
Expenditures	Just adequate	-0.490***		-0.490***		-0.488***	
(Ref: more than adequate)		(6.69)		(4.85)		(4.61)	
	Less than adequate	-0.793***		-0.783***		-0.803***	
		(10.50)		(7.51)		(7.35)	
Income ladder			0.155***		0.161***		0.149***
			(17.13)		(12.70)		(11.59)
Decomposition of variance							
Explained	Between	1.047	1.071	0.860	0.893	1.200	1.213
		(35.7%)	(36.7%)	(31.6%)	(32.8%)	(38.9%)	(39.7%)
	Within	0.024	0.028	0.024	0.029	0.024	0.027
		(0.8%)	(1.0%)	(0.9%)	(1.1%)	(0.8%)	(0.9%)
Unexplained	Between	0.860	0.819	0.841	0.803	0.859	0.814
		(29.3%)	(28.1%)	(30.9%)	(29.5%)	(27.9%)	(26.7%)
	Within	1.000	1.000	1.000	1.000	1.000	1.000
		(34.1%)	(34.3%)	(36.7%)	(36.7%)	(32.4%)	(32.7%)
Observations		12360	12360	6231	6231	6129	6129
Log likelihood		-12473.2	-12419.9	-6239.8	-6204.7	-6215.1	-6195.9

Source: Albanian LSMS 2002-2003-2004.

Random effects ordered Probit models, estimated by a maximum likelihood method. Absolute value of t-statistics are in parentheses. Significance levels are respectively 1% (***), 5% (**) and 10% (*).

Table 6. Random effects estimates of health evolution since last year

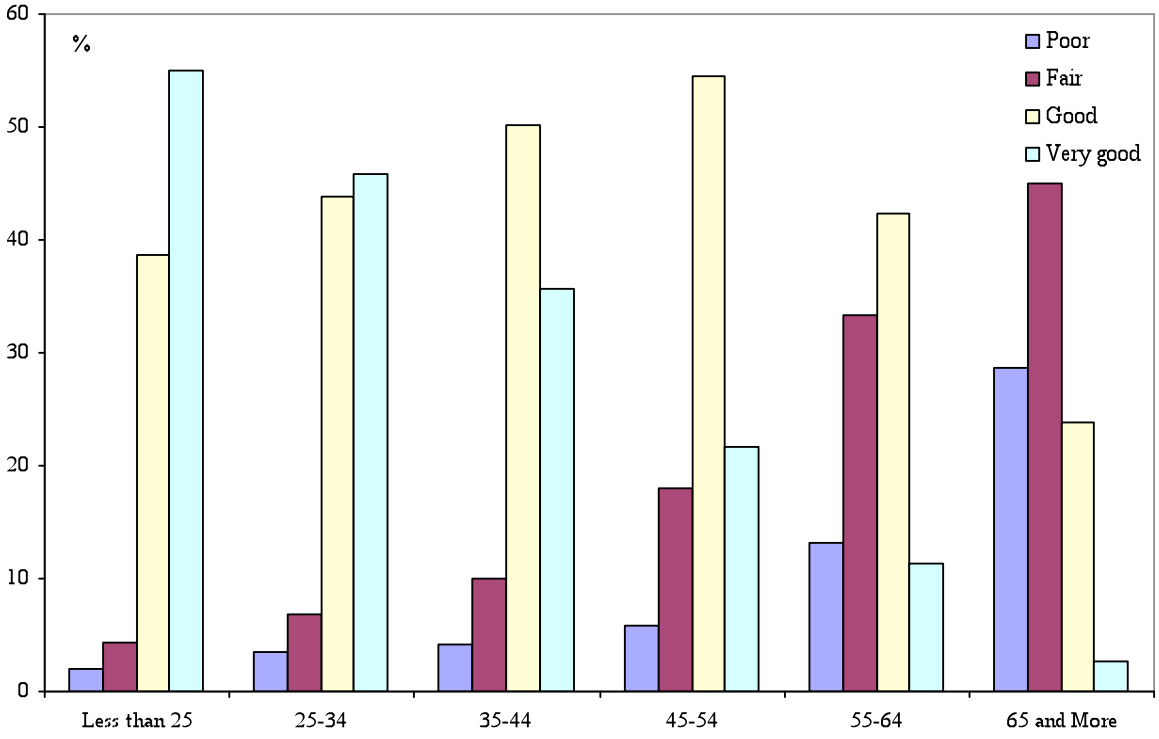
Explanatory variables		All			Men		Women	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female		-0.134***	-0.130***	-0.099***				
		(4.64)	(3.37)	(2.71)				
Age	25 – 34	-0.191***	-0.190**	-0.154*	-0.279**	-0.250**	-0.102	-0.057
(ref : Less than 25)		(3.05)	(2.27)	(1.92)	(2.18)	(2.06)	(0.90)	(0.53)
	35 – 44	-0.397***	-0.352***	-0.284***	-0.345**	-0.306**	-0.326***	-0.232**
		(5.86)	(3.83)	(3.23)	(2.45)	(2.29)	(2.64)	(1.97)
	45 – 54	-0.566***	-0.514***	-0.416***	-0.541***	-0.490***	-0.466***	-0.331***
		(7.93)	(5.32)	(4.51)	(3.71)	(3.52)	(3.60)	(2.67)
	55 – 64	-0.708***	-0.635***	-0.502***	-0.734***	-0.643***	-0.544***	-0.375***
		(9.29)	(6.15)	(5.04)	(4.71)	(4.29)	(3.93)	(2.80)
	65 and above	-1.057***	-1.032***	-0.828***	-1.111***	-0.958***	-0.981***	-0.730***
		(12.80)	(9.26)	(7.65)	(6.77)	(6.02)	(6.34)	(4.86)
Single		0.080	0.236***	0.232***	0.148	0.127	0.315***	0.324***
		(1.35)	(2.95)	(3.04)	(1.23)	(1.11)	(2.92)	(3.16)
Divorced or widowed		-0.161**	-0.130	-0.102	-0.328	-0.290	-0.042	-0.023
		(2.47)	(1.50)	(1.24)	(1.60)	(1.49)	(0.44)	(0.26)
Number of children 0-4		0.025	0.075**	0.059*	0.041	0.017	0.108**	0.098**
		(0.95)	(2.04)	(1.66)	(0.77)	(0.32)	(2.08)	(1.98)
Number of children 5-11		0.045**	0.079***	0.065***	0.070*	0.055	0.072**	0.060*
		(2.36)	(3.02)	(2.60)	(1.75)	(1.43)	(2.01)	(1.75)
Number of children 12-18		0.052***	0.069***	0.059***	0.049	0.044	0.082***	0.069**
		(3.10)	(3.02)	(2.71)	(1.39)	(1.31)	(2.61)	(2.29)
Diploma	Primary 8 years	0.236***	0.225***	0.183***	0.193**	0.165*	0.235***	0.190**
(ref: None)		(5.17)	(3.66)	(3.14)	(2.09)	(1.88)	(2.82)	(2.40)
	Vocational	0.281***	0.255***	0.193***	0.174	0.128	0.308***	0.244**
		(4.94)	(3.34)	(2.65)	(1.59)	(1.23)	(2.80)	(2.33)
	Secondary	0.331***	0.384***	0.298***	0.276**	0.222**	0.446***	0.343***
		(5.74)	(4.96)	(4.05)	(2.42)	(2.05)	(4.15)	(3.35)
	University	0.322***	0.348***	0.251***	0.322**	0.251**	0.297**	0.177
		(4.69)	(3.80)	(2.88)	(2.52)	(2.07)	(2.13)	(1.33)
Muslim		0.066*	0.012	-0.004	-0.004	-0.026	0.027	0.019
		(1.94)	(0.26)	(0.09)	(0.06)	(0.40)	(0.46)	(0.34)
Urban		0.053*	0.103**	0.090**	0.112*	0.100*	0.100*	0.082
		(1.75)	(2.55)	(2.33)	(1.86)	(1.75)	(1.80)	(1.55)
Income ladder		0.041***	0.058***	0.053***	0.065***	0.061***	0.053***	0.047***
		(5.00)	(5.04)	(4.73)	(3.81)	(3.68)	(3.38)	(3.09)
Self-reported health in t worse than in t-1			-0.302***		-0.387***		-0.236***	
			(6.96)		(5.97)		(4.02)	
Self-reported health in t better than in t-1			0.266***		0.211***		0.310***	
			(6.30)		(3.39)		(5.38)	
Chronic illness or disability longer than 3 months in t-1				-0.346***		-0.326***		-0.360***
				(7.52)		(4.60)		(5.97)
Illness or injury during the last 4 weeks in t-1				-0.058		0.034		-0.118*
				(1.11)		(0.40)		(1.79)
Observations		12360	8240	8240	4154	4154	4086	4086
Log likelihood		-8441.5	-5037.1	-5074.8	-2435.7	-2460.5	-2587.6	-2601.4

Source: Albanian LSMS 2002-2003-2004.

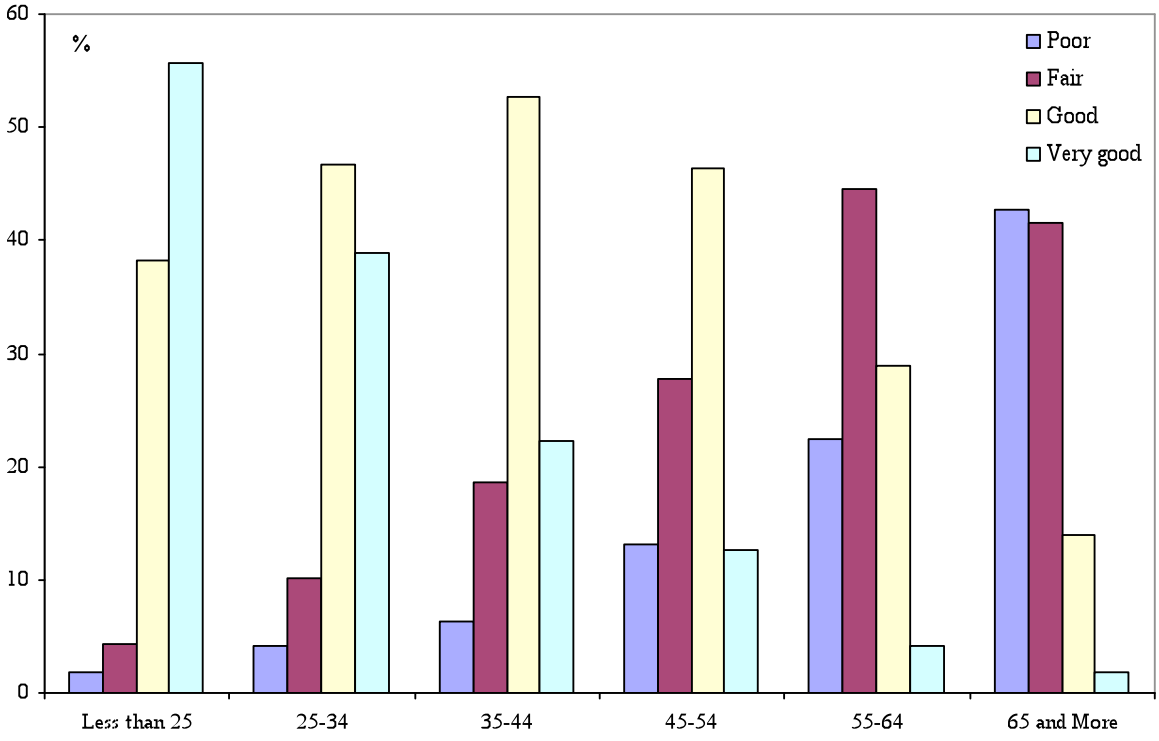
Random effects ordered Probit models, estimated by a maximum likelihood method. Absolute value of t-statistics are in parentheses. Significance levels are respectively 1% (***), 5% (**) and 10% (*).

Figure 1. Self-assessed health status, by age and gender

A. Men



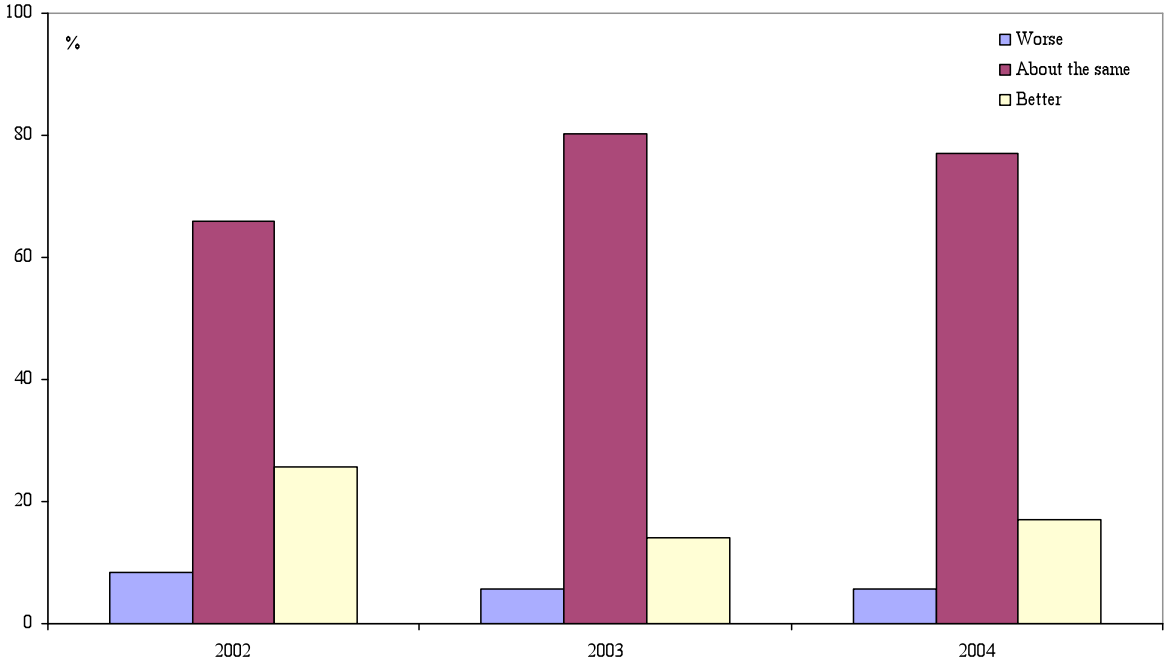
B. Women



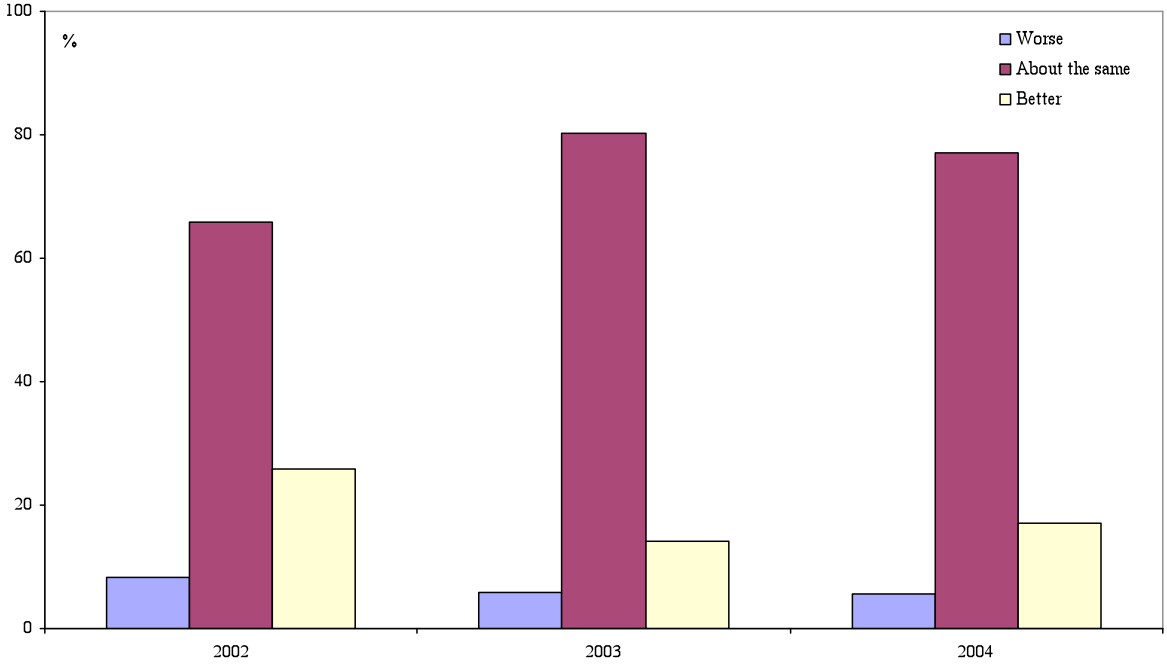
Source: Albanian LSMS 2002-2003-2004.

Figure 2. Self-assessment of change in health since last year, by gender

A. Men



B. Women



Source: Albanian LSMS 2002-2003-2004.

Appendix

Table A. Description of the male and female pooled subsamples

Characteristics		Male		Female		All	
		Mean	s.d.	Mean	s.d.	Mean	s.d.
Female		0.000	(0.000)	1.000	(0.000)	0.496	(0.500)
Age	Less than 25	0.150	(0.357)	0.171	(0.377)	0.161	(0.367)
	25 – 34	0.144	(0.352)	0.163	(0.369)	0.154	(0.361)
	35 – 44	0.234	(0.424)	0.231	(0.422)	0.233	(0.423)
	45 – 54	0.201	(0.401)	0.190	(0.393)	0.196	(0.397)
	55 – 64	0.145	(0.352)	0.141	(0.348)	0.143	(0.350)
	65 and above	0.124	(0.330)	0.103	(0.305)	0.114	(0.318)
Single		0.197	(0.397)	0.200	(0.400)	0.198	(0.399)
Married		0.784	(0.411)	0.710	(0.454)	0.747	(0.434)
Divorced or widowed		0.019	(0.136)	0.090	(0.287)	0.054	(0.227)
Number of children 0-4		0.295	(0.577)	0.244	(0.524)	0.270	(0.552)
Number of children 5-11		0.531	(0.792)	0.531	(0.792)	0.531	(0.792)
Number of children 12-18		0.711	(0.911)	0.759	(0.950)	0.735	(0.931)
Diploma	None	0.155	(0.362)	0.198	(0.398)	0.176	(0.381)
	Primary 8 years	0.441	(0.497)	0.486	(0.500)	0.463	(0.499)
	Vocational	0.161	(0.368)	0.114	(0.317)	0.138	(0.345)
	Secondary	0.151	(0.358)	0.145	(0.352)	0.148	(0.355)
	University	0.093	(0.290)	0.057	(0.233)	0.075	(0.264)
Muslim		0.787	(0.410)	0.757	(0.429)	0.772	(0.420)
Urban		0.501	(0.500)	0.492	(0.500)	0.497	(0.500)
Expenditures	More than adequate	0.042	(0.200)	0.036	(0.187)	0.039	(0.194)
	Just adequate	0.557	(0.497)	0.554	(0.497)	0.555	(0.497)
	Less than adequate	0.401	(0.490)	0.410	(0.492)	0.406	(0.491)
Income ladder		4.074	(1.677)	4.022	(1.659)	4.048	(1.668)
Number of observations		6231		6129		12360	

Source: Albanian LSMS 2002-2003-2004.