Downward Mobility, Unemployment and Mortality

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Abstract:
This study presents fresh evidence on the contribution of social mobility to longevity. Downward mobility, as an influential experience itself, is analyzed for its impact on health, above and beyond selection, origin or destination effects. Moreover, downward mobility and unemployment are considered as individual-level consequences of economic crisis and transition in Russia. This strategy aims to further the debate surrounding Russia's enigmatic mortality crisis. Specifically, downward mobility and unemployment are assessed as possible contributors to increased risk of death from 1994-2005 using RLMS data and Cox proportional hazard models. Evidence emerges that downward mobility increased the risk of mortality for men, but not for women. However, both men's and women's risk of death substantially increased when experiencing unemployment. The impact of downward mobility and unemployment appears to be lasting, as the risk of death remained high in subsequent years as well. All findings were robust to the adjustment of other potentially important factors such as prior alcohol consumption and health status, which suggests that selection effects alone may not be a sufficient explanation for how mobility and unemployment impacted mortality risks.

INTRODUCTION

Social mobility has been well analyzed in past health research and has been linked to the continuing and, at times, increasing health differential among classes (e.g., Dahl and Kjaersgaard 1993; Claussen, Smits, Naess, and Davey Smith 2005; Hart, Davey Smith, and Blane 1998; Davey Smith, Hart, Blane, Gillis, and Hawthorne 1997; Hemmingsson and Lundberg 2005; Nilsson, Nilsson, Östergren, and Berglund 2005; Power, Matthews, and Manor 1996; Stern 1983; Bartley and Plewis 2007; Boyle, Norman and Popham 2009). In this tradition of research, researchers have attempted to understand whether the health divide continues to exist simply because people are sorted into classes through health-related mobility or whether the environment that is characteristic of a class supports or inhibits health. Much attention has been given to whether mobile individuals reflect the health and longevity characteristics of the origin or of the destination class. Underlying the "sorting" explanations is the premise that there is selectivity into mobility based on health; those who are unhealthy are more likely to be downwardly mobile and vice versa. The "exposure" explanation is based on a premise that reflects a cumulative life course perspective; prolonged exposure to a class environment is how class location and mobility matter to health.

This paper proposes an altogether different interpretation of the impact of mobility: experiencing downward mobility may in and of itself be detrimental to health due to the loss of previous resources and social status. In other words, this research focuses on whether there is a health reaction to this *event*, which is fundamentally different to how downward mobility has been considered to matter to health in past research. A loss of previous resources or status may threaten individuals' perceived core social roles, such as the work role, and influence health by inhibiting successful self-regulation, leading to "adaptive breakdown" and "addictive behaviors as a means of compensating for unsuccessful self-regulation" (Siegrist 2000 p. 1286). As such, I argue that downward mobility, as an influential experience, may warrant space in the debate on health and longevity. In other words, rather than perceive downward mobility as merely a recalibrating mechanism of the health divide, downward mobility may be a factor worth studying on its own, as it captures a critical life event that can be disorienting, devaluing and financially difficult for individuals.

With the recent turbulence in the global market, we continue to see high rates of job turnover and job loss, which renders this line of investigation particularly timely. While the effects of the current recession are impossible to assess this early on, I turn to a case in recent history when there was high labor market turnover and job loss for a significant time period. Specifically, this study focuses on the case of Russia, in which radical changes have been taking place at the economic and social level since the end of the Soviet Union in 1991. During the transition from communism, market reform increased the importance of income through wage dispersion and price liberalization; moreover, economic restructuring and crisis increased the difficulty of making ends meet through inflation, wage arrears, and job loss (Blanchard 1997; Barr 2001). The transition from communism essentially increased returns to being located in a higher class and having more resources at the same time that it knocked workers out of previous jobs and increased the cost of living. These tumultuous conditions provide a context in which we have a long enough time span and rich data to carefully treat the impact of economic instability on mortality.

Moreover, Russia is a particularly interesting case to study the relationship between health and mobility because these economic, political and social transformations were accompanied by dramatic increases in mortality rates, particularly for working-aged men (Shkolnikov et al. 2001). The debate over the causes of the mortality crisis in Russia has been limited in its capacity to disentangle contributing factors at the individual level, in contrast to macro-level factors, as few resources exist that offer detailed information about personal conditions before death occurred. After over a decade of scholarship on the subject, the debate revolves around two co-existing explanations:[1] Researchers have argued that 1) increased economic insecurity and hardship created psychosocial stress and led to poorer health and mortality (Cornia and Paniccià 1998; Shkolnikov, Cornia, Leon, and Meslé 1998; Leon and Shkolnikov 1998; Vågero and Kislitsyna 2005) and; 2) poor health behaviors inherited from lifestyles that were developed under the Soviet regime led to an increase in mortality (Cockerham 1999, 2000, 2006; Shkolnikov, Andreev, Leon, McKee, Meslé, and Vallin 2004). Alcohol consumption has particularly proven to be a major factor in increased death rates; Leon et al. (2007) estimate that almost half of

[1] See Stillman (2006) for an extensive review of explanations and research on mortality trends across the entire post-communist region.

all deaths can be attributed to hazardous drinking for working-aged men in their study on Izhevsk in Russia. Other epidemiological studies that have established the relationship between alcohol and mortality in Russia are the Novosibirsk cohort study (Malyutina, Bobak, Kurilovitch, et al. 2002) and a case-control study of working-aged men across the Udmurt Republic (Shkolnikov, Chervyakov, McKee, and Leon 2004).

The two explanations are not necessarily mutually exclusive; indeed, Brainerd and Cutler (2005), among others, found evidence that both stress and alcohol consumption contributed to higher mortality in men. However, difficulties in assessing the validity of the economic context and stress explanation at the micro level have restricted efforts at empirically confirming the stress hypothesis, although many researchers acknowledge its plausibility. One epidemiological study of the city of Taganrog (Vågero and Kislitsyna 2005) found a strong relationship between poverty, both present and past, and heart symptoms for both men and women. But findings that support the stress hypothesis have been called into question because of the possibility of endogeneity in the relationship between health and performance in the labor market, as well as poor health behavior and economic circumstances (Shkolnikov et al. 2004a; Suhrcke et al. 2007). The present research contributes to the discussion by attempting a new strategy to assess whether experiences related to economic crisis and transition, reflected in micro-level data, contributed to deaths in Russia over the time period 1994-2005. Special attention is given in this analysis to issues of selection and endogeneity in order to better interpret the relationships that emerge. Furthermore, this paper specifically takes into account the findings on the role of alcohol consumption in the Russian mortality crisis and seeks to integrate both the stress-related and alcohol-related explanations in the literature.

Given the tension between increasing returns to resources and the widespread loss of resources, I propose downward social mobility and unemployment as proxies for the individually-experienced negative consequences of economic transition and crisis during this time period. Both downward mobility and job loss imply a loss of previous resources, which include social standing, income, embeddedness in social networks and prestige (Erikson and Goldthorpe 1992; Treiman 1977). This loss of resources likely had negative effects on well-being and was also likely accompanied

by psychosocial stress for those, and their family members, who were not fortunate in the labor market.[2]

The relationship between unemployment and mortality at the micro-level has been explored, particularly in relation to the post-communist transition and economic crisis (see Blazek and Dzúrová 2000 for Czech Republic; Cornia 2000 and Walberg, McKee, Shkolnikov, Chenet, and Leon 1998 for Russia; Krumins and Usackis 2000 for Latvia; Riphan and Zimmerman 2000 for the former GDR; Abdala, Geldstein, and Mychaszula 2000, for Argentina). Strully (2009) recently investigated the link between unemployment and health by studying the impact of unemployment on workers who lost their jobs due to plant closure and not for health reasons, thus, avoiding the endogeneity problem often inherent in such research. She finds that with the closing of a firm, those who were laid off, and did not have a previous health condition, had 83% higher odds of developing a new health condition. The odds of experiencing fair or poor health increased by 54%. Strully's research demonstrates not only an immediate health reaction to labor market turnover but that the experience of losing one's job also has lasting effects on health. In the case of Russia, Denisova (2009) finds that experiencing poverty increases the risk of death for men and women of all ages in Russia. This evidence suggests an impact of absolute levels of resources.

To summarize, I argue in this paper that the economic crisis and transition brought about downward mobility and unemployment, which played a role in the mortality crisis. I use the Russian Longitudinal Monitoring Survey (RLMS), which allows for an analysis that distinguishes between factors related to economic crisis and transition and pre-existing health conditions and behavior. Specifically, I address the following questions: 1) Which characteristics were related to an increased risk of death, especially in regards to resources? 2) Did experiencing downward mobility or unemployment increase the risk of death above and beyond individual characteristics and absolute resource levels? 3) If mobility or unemployment influences health and longevity, is the nature of the risk immediate or prolonged? 4) Does excessive alcohol consumption or poor health preceding downward mobility or unemployment explain

[2] We may expect unemployment to have a greater impact than downward mobility since overall loss of resources and increased uncertainty should be greater when experiencing unemployment. We may also expect a differential impact of downward mobility based on the level from which one drifts downward. These are empirical issues that will be addressed in the analysis.

the increased risk of death? 5) Does the experience of DSM or unemployment increase the odds of excessive alcohol consumption or poor health?

The next sections describe the data and analytical strategy as well as the results. I conclude with a discussion of the results, possible forms of bias in this study and further areas of research needed to illuminate the link between turbulent economic contexts and health.

DATA AND METHODS

The RLMS data were collected from a multistage probability sampling of dwelling units from over 2000 raions (similar to counties) and cover the years 1994-2005. These raions cover 95.5% of the total population of Russia. Highly remote areas, as well as Chechnya, were not included in the sample. To allow for lower response rates in highly urbanized areas, each round of data collection oversampled accordingly, leading to a sample target of over 4700 dwellings a year. Around 4000 households were surveyed each year and the response rate varied from 50.8% in the most recent wave to 87.6% in the first. Within the household, the response rate was at least 97% in each round. Although this survey was not designed to be a true panel data set, it is possible to follow individuals over many waves.[3] Therefore, this analysis includes individuals that participated in multiple survey rounds.

The dependent variable is death of the respondent and all deaths are reported by other members of the household in the survey following the year in which a death took place. Since deaths are reported through proxy respondents, it is not possible to capture deaths of individuals living alone.[4] Moreover, all individuals who skipped participation in one or more survey rounds are censored at the moment they skip a round since it is not possible to accurately account for individuals' status during the missing waves. When studying relative changes in status from one year to the next, as in the case of mobility, those deaths in which we only have information for one wave are excluded as well, since it is not possible to capture mobility without at least two waves of data before the death. For these reasons, 267 deaths are excluded over the 11

[3] An idiosyncrasy in this data is that although the majority of surveys were annual, two years were skipped. This analysis is based on data from 1994, 1995, 1996, 1998, 2000, 2001, 2002, 2003, 2004, 2005.

[4] Between 3 and 12% of all respondents in the sample lived alone, depending on the wave.

years for which we have at least one wave of information about the remaining individuals.[5]

Attrition is a problem with the RLMS data since households and individuals sometimes left the sample by moving into a new dwelling. Each wave included new entrants to the survey to make up for the loss of movers. In general, these movers were not followed to remain in the survey. The actual composition of the RLMS sample analyzed bears close resemblance to the total Russian sample in terms of education according to the All-Russian Population Census in 2002. Those who had completed tertiary education were 17.2% of the total Russian population in 2002 versus 18.3% of the RLMS 2002 sample. A greater difference was found in regards to the lower two educational attainment groups: 56.6% of RLMS respondents completed secondary education and 25.1% did not, in contrast to 50% and 32.8% in the total population. This difference is to be expected given that we know those with very low education levels were the ones more likely to leave the sample through attrition. Besides this discrepancy, the education profile of the RLMS sample appears similar to the general population.

Figures 1 and 2 portray the frequency of deaths at all ages in this sample from 1994-2005 by sex. As evident, although men in their 70s experienced the greatest peak in mortality, the frequency quickly diminished at older ages and the majority of all deaths took place below the age of 70. For women, the greater share of deaths took place above the age of 70. However, there were still quite a few deaths in the working-age female population.

Figures 1 and 2 about here.

Kaplan-Meier survival estimates in Figures 3 and 4 present mortality estimates of the RLMS panel sample as they occur over calendar time, by age groups and sex. Nearly 80% of women over the age of 60 survived all years of analysis in contrast to less than 65% of men. And, as we know from much documentation on the scope and structure of increased mortality during transition from communism, men in the 40-60

[5] The only statistically significant difference ($p<0.05$; measured through logistic regression) between the characteristics of individuals who died after only one survey round or after having missed one or more survey rounds (taken from the last survey in which they participated) and the characteristics of those whose deaths were captured in the analysis, were that the excluded deaths were less likely to occur in the oldest age groups.

year old age group were much more likely to die than women in the same age group. Particularly interesting is that the survival rates of men in the 50-54 age group were slightly better than men in the 45-49 year old age group. A perfect gradation by age is therefore not seen for the Russian men in this sample. Women's survival rates for all age groups under the age of 60 were more or less the same.

Figures 3 and 4 about here

Model and Analytical Strategy

Cox proportional hazard models are used to estimate the impact of time-constant and time-varying factors on the risk of death, using a discrete event history format. Age is used as the process time in the model and a variable capturing the number of years in the survey is also included to accurately capture the impact of age and time.[6] The sample was restricted to only those respondents that are 65 and younger in order to focus on the age groups that have been shown to be most at risk of excess mortality during this time period and to remove any confounding input of factors relevant to the older population.

The control variables that were included in all models were urban/rural residence, union status, smoking status, alcohol consumption measures, diagnoses of heart attack or stroke, missing work status, self-rated health, labor force status and class, and education level. Exposure and occurrence rates of all variables are provided in Table A in the Appendix. A series of dummies capture whether the respondent currently lives in an urban area, township or rural area. Union status reflects whether the respondent is in a cohabiting union. Smoking status is a dichotomous variable in which the respondent is coded as either being a current smoker or not. Excessive alcohol consumption is measured with a dichotomous variable indicating whether the respondent falls into the top decile of total grams of alcohol consumed in a day of the last 30 days.[7] The construction of these deciles is gender-specific and is based only on those who drink alcohol so the amounts were not biased by those who do not drink.

[6] The results are robust to other specifications of the model in which calendar time was used as process time in the model and age introduced as a time-changing covariate.

[7] Although other research based on RLMS data has used the top 20% as a cutoff point for excessive alcohol consumption, sensitivity tests demonstrated that mortality was more highly associated with a narrower definition of excessive alcohol consumption.

Therefore, the bottom 90% is inflated with the addition of all the non-drinkers. The mean number of grams of alcohol consumed by excessive drinkers who are women and men was 54 and 201, respectively. The respondents who reported high consumption levels most often consumed vodka and other hard liquor. Additionally, a series of dummy variables are introduced into the model to indicate whether the respondent has drunk any alcohol at all in the last month, only a few times in the past month, a few times a week, or almost daily.

Four indicators are included to reflect the health status of each respondent. Health conditions were captured with two dichotomous variables indicating whether a respondent has ever been diagnosed with a heart attack or a stroke. New health conditions are therefore indicates as soon as diagnosis occurs. Another dichotomous variable captures whether a respondent has missed "any work or study days due to illness" in the past month. This variable is particularly useful in understanding the extent to which respondents' livelihoods are affected by health. The final health variable is self-rated health and indicates whether the respondent rates his/her health as being bad or very bad versus average, good or very good.

Education was introduced as a series of dummies in which respondents were classified as 1) not having completed secondary education, 2) having completed secondary education at least, including those who received vocational or technical training as well, and 3) having completed university education. The labor force variable harmonizes participation and occupational class information[8] and consists of the following categories: 1) unemployed; 2) not participating in the labor force due to caring responsibilities; 3) not participating in the labor force because respondent is studying, retired, disabled or other; 4) a manual or routine worker; 5) a low-mid grade employee; 6) intermediate employee, or; 7) part of the "salariat" or professional class.

In contrast to the majority of literature on mobility and health, this study observes changes in resources rather than changes in occupation. In the transitional context of Russia during this time period, occupational measures come with a variety of ambiguities that make interpretation of occupational class complicated. The rich data available in the RLMS offers more objective measures that clearly indicate levels of resources and social status, which avoids issues related to the dramatic changes in

[8] Occupational class was constructed using ISER's approach that transforms 3-digit ISCO88 codes into the European Socioeconomic Classification, which is based on the EGP (Erikson-Goldthorpe-Portocarero) framework (Rose and Harrison 2007). ISCO88 codes were assigned with particular care to take into account Russian idiosyncrasies of occupations (Carolina Population Center 2009).

the labor market during this time. The most objective indicator of the level of individual financial resources is earnings or income. Loss of personal earnings might best approximate a cause of psychosocial stress, given that stress is likely to increase if one is not able to contribute to or maintain one's contribution to household income. However, total household resources may smooth the loss of part or all earnings. Therefore, household income might be the more appropriate measure for assessing resources and mobility. Moreover, if a respondent has wages, this implies that respondents are healthy or stable enough to remain in the labor market. Therefore, a healthy worker effect may bias a measure that relies strictly on labor market involvement. For this reason, the sample is not limited to workers only and the impact of being downwardly mobile is considered after adjusting for labor market status, which should bias results downwards given that some level of health is required to maintain employment.[9]

Moreover, a measure of household income may capture important changes in the income of other household members. For these reasons, loss of real household total income is used as one measure of mobility. This measure includes all home production and other household-level and individual-level income variables and reflects real household income since all amounts have been pegged to values in June 1992. I also adjusted this measure to reflect economies of scales, by using the revised OECD equivalence scale in which the first adult in the household retains the value of 1, every additional adult is assigned the value of 0.5 and every child (less than 14 years old) is assigned a value of 0.3. The total household income is divided by the sum of these values and the measure is, thus, the equivalent income per person within the household. Quartiles of income were constructed on a yearly basis and reflect the respondent's rank in a distribution of real adjusted income. Some underreporting of household income is to be expected. But because this analysis uses location in the distribution of income, under-reporting is only problematic if it occurs at one end of the income distribution more than another. Whether the distribution is skewed by under-reporting bias can be initially assessed by observing whether there is a uniform gradient in mean expenditure by income. Figure 5 demonstrates that the gradient in expenditure conforms to income quartiles, which is some evidence that underreporting

[9] Indeed, limiting my analyses to only those with a paid position in the labor market increased the magnitude of my findings for men.

of income is likely more or less uniform and does not vary greatly according to income levels.

Figure 5 about here.

The second measure of resources is subjective and indicates whether the respondent experienced a downward shift in his/her location on a 9-step ladder that ranks personal wealth according to others' wealth.[10] When the respondent ranks his/her wealth rank lower than the previous year, this constitutes downward relative wealth mobility.[11] This measure may come closest to capturing the link between economic circumstances and health since it is possible that individuals or households experience a real loss in resources yet it may not always change their perception of how they fit into the larger context. Therefore, this measure introduces the important element of inequality, which may have intensified or lessened feelings over loss of resources. It may be that wage arrears and job loss diminished household income for many simultaneously, rendering the experience less personally significant. Indeed, RLMS data report between 40-63% of all individuals experienced wage arrears or in-kind payment of wages from 1994-1998. Finally, although it comes at the price of objective clarity of external conditions, a subjective wealth measure moves one step deeper into the causal chain leading from the economic context to a health impact, in that it reflects the perceptions of individuals.

The first step in this analysis is to analyze whether experiencing downward mobility or unemployment is related to a higher risk of death. The second step is to assess whether such a relationship might be explained by health selection or alcohol consumption selection into downward social mobility or unemployment. It may be that it is not downward mobility or job loss that impacts death risks, but rather poor health or excessive alcohol consumption before downward mobility occurred that leads to both job instability and death. This aspect of the analysis, therefore, addresses the issue of endogeneity in the debate over the mortality crisis in Russia and addresses the assumption in the health divide literature that mobility occurs because of selection.

[10] The exact wording of the question in the survey is the following: "And now, please, imagine a 9-step ladder where on the bottom, the first step, stand the poorest people, and on the highest step, the ninth, stand the rich. On which step are you today?"

[11] In another specification of this measure, in which the 9 steps were consolidated into 3 categories, the results were more or less the same.

The strategy adopted to assess this form of endogeneity is to control for health and alcohol consumption in the year preceding downward mobility. Still relying on at least two waves of data, the model now includes not only current characteristics and whether downward mobility or unemployment has occurred (at time t) but health status or excessive alcohol consumption status in the preceding year (t-1). The results of these models will indicate whether downward mobility or unemployment still has an impact on the risk of death when previous health and alcohol consumption are controlled for.

When working with mobility as an explanatory variable, there is risk of merely picking up effects that are related to the origin or destination status. Since most people do not change status from year to year, both origin and destination status cannot be included in the model simultaneously. Researchers assessing mobility within the health divide debate have two opposing perspectives that would recommend different approaches (e.g., Dahl and Kjaersgaard 1993; Claussen et al. 2005; Hart et al. 1998; Davey Smith et al. 1997; Hemmingsson and Lundberg 2005; Nilsson et al. 2005; Power et al. 1996; Stern 1983). Those who believe that longevity is related to initial conditions that factor into cumulative health would consider origin status the most important status to include. As destination status is controlled for in the first models, the fourth step in this analysis is to control for the confounding effect of origin status. This step is important to account for the fact that those who are in the lowest class already are not able to experience downward mobility.[12] The question of which status should be controlled for is not easily resolved theoretically and, therefore, the models are estimated twice, once with origin class and once with destination class included. A comparison of the results of the two might empirically tell us which status bears more weight on the risk of immediate death.

Finally, a model is constructed to test whether the impact of experiencing downward mobility or unemployment is lasting or short-term. The estimates of a model in which the respondent ever experienced unemployment or downward mobility in the time period observed are compared to the impact of current downward mobility and unemployment. Because unemployment and downward mobility can only be captured in the waves in which the respondent participated, past negative

[12] This potential source of bias is not of great concern given that it would only weaken the results and not inflate them, since we know that health is poorest in the lowest occupational class ranking and since they are the ones that cannot experience downward mobility.

labor market experiences that might have occurred in the earliest years of the transition are unfortunately not accounted for.

RESULTS

The impact of most control variables does not greatly change depending on whether downward mobility or unemployment is assessed. (See full results of a baseline model that excludes mobility in the Appendix B) Figures 6 and 7 display the key results of this study, which are the impact of downward mobility and unemployment on the risk of death for men and women. All three sets of findings are from separate models in which the previously described control variables are included along with one measure of downward mobility or labor force status. The results for men, in Figure 6, are discussed first. In all instances, downward mobility and unemployment increased the risk of death for men and these relative risks were statistically significant. Men under 66 who experienced a drop in a quartile rank of equivalized real total household income were at a 39% greater risk of death than men who did not experience this decline when everything else is equal. The impact of experiencing a downward shift in where men ranked themselves in terms of personal wealth was even more pronounced. Men who experienced this form of downward mobility were at a 43% greater risk of death, relative to those who did not experience downward mobility. The greatest predictor of death was unemployment, which increased the risk of death by 78%, relative to those who were not unemployed.

Figure 6 about here.

Figure 7 displays the results of the same models for women. Downward mobility, whether experienced in terms of objective household income or subjective personal wealth, had no consistent or statistically significant impact on women's risk of death. However, the impact of unemployment was even greater for women than for men; unemployed women had a risk of death that was almost three times greater than women who were gainfully employed or not participating in the labor market. Because downward mobility does not appear to be related to death risks for women, further investigation of how mobility impacts death risks is limited to men only. Women will be once again brought into the discussion on unemployment.

Figure 7 about here.

Table 1 displays the relative risks of experiencing downward mobility according to different specifications of the model. The relative risks for both measures of downward mobility are included in the same table for comparison even though they were introduced into the model separately. The first model includes only the basic set of control variables and the measure of downward mobility, which reveals the relative risks that are displayed in Figure 5. The next models assess whether the relationship between mobility/unemployment and mortality is attenuated when controlling for past alcohol consumption or poor health, which may have led to job change or loss. Therefore, the second model includes not only the original control variables, but alcohol consumption measures for the preceding year as well. The third model is similar to the second except evaluation of health in the preceding year is now included. The fourth model drops the current level of income/wealth rank and includes the previous level instead. The final model assesses the impact of downward mobility as a potentially long-term risk factor. Observing how the impact of mobility (or unemployment in the following table) changes with these specifications ought to shed more light on how mobility is related to an increased risk of death.

First, assessing mobility in the form of household income, the baseline effect is 39%. When controlling for alcohol related factors prior to mobility, the effect diminishes, but is still robust and statistically significant; men still have a 29% greater risk of death. Previous health status appears not to mediate the impact of income mobility as much as previous alcohol consumption, but still slightly diminishes the baseline effect. The most dramatic change in the impact of mobility appeared when origin status, rather than destination, was held constant; rather than a 39% increased risk of death, it increased to 59%. The results of this specific model, which controls for origin state, are in line with expectations; we should expect weaker results in the models that do not control for the origin state since we would expect health to be poorest in the lowest ranking and those in the lowest ranking cannot experience downward mobility. Not shown in the table, for reasons of space, are interactions between downward mobility and previous wealth ranking. It appears that the negative health effect of downward mobility for men is driven by those in the middle ranking who experience a fall, not those in the highest (according to statistical significance,

although results for both the mid and highest rank interactions show an increase in mortality risk when downwardly mobile).Finally, when unemployment is considered as having more than an immediate impact, the risk declines to 29%. This indicates that the experience of downward mobility is most potent in the year following the mobility; yet, even beyond this point, downward mobility has a robust and strong relationship with death risks.

A similar pattern emerges for the measure of mobility based on the subjective ranking of personal wealth. Controlling for alcohol consumption in the previous year brought the risk of death down from 43% to 30%. However, mobility still remained a strongly significant predictor of death even when poor health behavior is controlled for. The risk of death due to wealth mobility remained similar to the original estimate when controlling for health in the previous year. Once again, controlling for origin state increased the impact of mobility, but less so for this form of mobility. In regards to the continued impact of mobility, it had a more or less similar impact on death as the measure that captured only current mobility.

Table 1 about here.

Now turning to the impact of unemployment on mortality risks, Table 2 displays results of multiple model specifications for men and women. The unemployment models were constructed similar to the mobility models, with the exclusion of an origin state model. Across the board, women's death risks were more impacted by unemployment than men's death risks. However, both men and women reveal being strongly impacted by unemployment. Interestingly, controlling for past alcohol consumption did not attenuate the impact of unemployment for men, while it did for women by a large amount (almost 50%). However, women were still two and a half times more likely to die if they were unemployed than if they were not, even when controlling for past alcohol consumption. Controlling for past health did not diminish the impact of unemployment for either men or women. Although somewhat smaller, the impact of unemployment was robust when considered beyond one or more spells of current unemployment. Unemployment continued to inflate the risk of death, by an increase of 67% for men and more than two times for women, even when it was an event in the past.

Table 2 about here.

DISCUSSION AND CONCLUSIONS

These results indicate many findings worth considering. Unemployment appears to be strongly related to the risk of death for men and even more so for women, no matter how the relationship is measured—immediate or prolonged, continued or short-term—and no matter which mediating variables, such as past alcohol consumption and poor health, are included. This relationship is an important finding in a context in which unemployment steadily increased during the 1990s and that is once again experiencing widespread job loss due to economic crisis. In addition, the finding that unemployment not only has a significant relationship to longevity, but that this relationship can be characterized as both acute and chronic confirms the prolonged impact of unemployment found by Strully (2009) in her studies on the U.S. context.

Estimates of the impact of downward mobility on mortality revealed a robust and statistically significant relationship for men, but not for women. The impact of mobility is stronger when the measure directly reflects how the respondent feels about his/her current level of resources compared to the previous wave (i.e., the subjective measure of personal wealth rather than the objective measure of household income). Theoretically, this may be the most fitting indicator of downward mobility. Although real total household income most directly reflects financial circumstances, the experience of downward mobility may be just as meaningful, or more so, when experienced subjectively and in relation to individual perceptions of status and inequality (Runciman 1971; Watson 1995). Moreover, the objective measure refers to the household and not just to the individual. This difference may be important, since ranking is mediated by others in the household, and could work in opposite ways. It may be that the total household welfare matters more than individual income; conversely, it may be just as likely that one's own contribution to household welfare is what matters most. The essence of the subjective ranking is the latter, since it is a measure of personal wealth.

That downward mobility appears to matter more for men's health than women's remains an area of speculation. The differential impact may be due to women experiencing stress differently in terms of their mental, emotional, behavioral and physical responses to stress. Or, men may perceive their role in providing material

resources to be of greater importance to household welfare, leaving them with feelings of greater pressure and responsibility. Without doubt, much research along these lines would help shed light on causal mechanisms at work, which are not covered in this study. For example, empirical investigation of Watson's (1995) theoretical framework would be useful to gather evidence of whether the devaluation of the public sphere and increasing importance of the private sphere left men without a realm in which their needs were adequately fulfilled and their role valorized. In any case, this study provides evidence that it is not strictly a matter of selection into unemployment and downward mobility on the basis of poor health and excessive alcohol consumption that relates these experiences to mortality. Furthermore, findings that are highly relevant to men are welcomed in this study given that men's mortality increases drove the mortality crisis in Russia.

To summarize, this study illuminated a new link between downward mobility and mortality: one that is immediate, does not rely on long-term risk exposure, is not strictly related to selection into mobility and is indicative of what we would expect if stress were a mechanism at work. Therefore, mobility appears to be important in a short-term time-frame during periods of rapid change or recession.

Four main findings emerged from the analysis: first, unemployment substantially increased the risk of mortality for both men and women. Second, downward mobility impacted men's mortality risks, whether measured as objective household income or subjective personal wealth. Third, the impact of downward mobility lessened over time when measured as income mobility, but had a prolonged effect when measured as a fall in personal wealth; the impact of unemployment also remained strong in the years following the spell of unemployment. Fourth, excessive alcohol consumption and poor health did not explain away the impact of downward mobility on death, measured currently and before the experience of job change or loss. These results support the goal of integrating the alcohol and stress explanations in the literature; however, they also indicate a more complex relationship between economic instability and mortality than one solely mediated by alcohol consumption.

Much room exists still for exploration into the relationship between downward mobility and mortality. One important limitation of this study is that the link between downward mobility and mental or emotional well-being, as well as the link between well-being and physical conditions that lead to death remain unidentified. Some important biases in this research must also be acknowledged. First, because the study

begins in 1994, there is left truncation in the sample since many of the most vulnerable individuals, including those most unfortunate in the labor market, may have died in the first peak of the economic and mortality crises in Russia. Because of the great number of lives lost in the early years of transition, living until 1994 in a sense may have already introduced selectivity into the sample. Another potential source of bias lies in how the dependent variable is measured; because a second person in the household is necessary for a report of death, the sample excludes all those who live alone. Therefore, the results cannot be generalized beyond the mortality of people who co-reside with another person. This is potentially problematic since research has shown that men without partners were particularly at risk during the transition (Watson, 1995). Indeed, the results of these analyses demonstrate a robust relationship between union status and mortality for men, in which single men are at a higher risk of death. Although this is accurately captured in this study, the results are not able to be generalized to the small population of individuals who reside completely alone.

Another limitation of this study revolves around the measures of alcohol consumption. At least three reasons exist for why the impact of excessive alcohol consumption may not be entirely accounted for in this study. First, individuals with the most severe alcohol consumption tendencies are likely selected out of being in the sample due to the disruption in private lives that this behavior entails. Second, the questions used to assess excessive alcohol consumption in this survey are not state of the art. Questions about non-beverage alcohol consumption (e.g., surrogate alcohols in the form of colognes, medicines, etc.) and "markers of problem drinking" have been shown to be important in assessing the impact of alcohol consumption in Russia (Leon et al. 2007). Questions related to the amount of alcohol too easily lead to underreporting of consumption, which Nemtsov (2003) claims is a problem in the RLMS data, especially for women. Third, the relationship between alcohol consumption and mortality may be obscured in this survey due to the short-dose response time of harmful alcohol consumption. Because the surveys are generally administered annually, the information in the last wave before death may not reflect the most crucial information about drinking behavior. In other words, we may be missing an important increase in alcohol consumption that quickly leads to death (Perlman and Bobak 2008). Despite the shortcomings of the alcohol consumption

measures in this study, they did nevertheless prove to be important to death risks as well as somewhat mediate the impact of mobility and unemployment.

In the end, the results of this study demonstrate how economic turbulence matters to health. Given widespread economic recession and increasing labor market disruption, downward mobility and unemployment are not unique to economies undergoing market reform. Depending on institutional differences, such as the degree of labor market regulation and safety nets in place, the occurrence and impact of downward mobility and unemployment will likely vary. Some studies have already shown this to be true (e.g., Jäntti et al. 2000 and Martikainen et al. 2007 on the Finish case versus Strully 2009 on the U.S. case). Nevertheless, in the current economic climate, the traditional relationship argued to exist between health and downward mobility ought to be re-conceptualized. Turbulent labor markets may create more downwardly mobile or unemployed individuals than ever before and the impact on longevity may be immediate. Drawing conclusions about the health of these individuals based merely on the assumption that they selected themselves into downward mobility and unemployment through unrelated poor health or health behaviors would be erroneous. The findings in this study support the need for further theoretical development regarding the relationship between health and turbulent economic contexts.

Appendix A: Summary Statistics

Variable	Exposures	Occurrences	Rate
<40 years	37689	78	0.002
40-44	8809	37	0.004
45-49	8369	46	0.007
50-54	6323	46	0.007
55-59	5865	69	0.012
60+	21390	643	0.030
men	37549	547	0.015
women	50896	387	0.008
smoker	29824	334	0.011
heavy alcohol cons.	10076	124	0.012
non-drinker	39757	558	0.140
heart attack diagnosed	2457	103	0.042
stroke diagnosed	1622	92	0.057
missed work from illness	4808	25	0.005
perceives health as poor	15321	547	0.036
unemployed	8632	70	0.008
routine/manual worker	14372	62	0.004
low-mid grade employees	13630	48	0.004
intermediate employees/ers	10562	8	0.001
salariat	7250	17	0.002
caring for someone	4626	6	0.001
other reasons not particip.	29373	723	0.025
urban residence	59555	566	0.010
township	5370	54	0.010
rural residence	23064	313	0.014
male-headed household	65140	545	0.008
female-headed household	8679	82	0.010
retired or young head	14170	306	0.022
in union	58039	554	0.010
not in union	30053	379	0.013
incomplete secondary educ	34987	636	0.018
complete secondary or more	37989	202	0.005
university or institute	15469	96	0.006
lowest real household income quartile	21103	251	0.012
low-mid real household income quartile	21079	311	0.015
mid-high real household income quartile	21089	203	0.010
highest real household income quartile	21088	144	0.007
relative wealth: lowest 3 steps	40962	561	0.014
relative wealth: mid 3 steps	43572	302	0.007
relative wealth: highest 3 steps	2413	11	0.005
DSM: subjective wealth distribution	10897	155	0.014
no DSM	77548	779	0.010
ever experienced unemployment	42427	535	0.013
never	46018	399	0.009
ever experienced DSM	32234	368	0.011
never	56211	566	0.010

Appendix B.

Cox Proportional Hazard Risks of Death in Russia for Men and Women under 66 years old, 1994-2005

Relative Risks of Static Model 1: Labor Force Participation and Class Status				
	Men		Women	
Years in survey	1.24**	(1.19-1.29)	1.24**	(1.15-1.33)
not in union (ref: in union)	1.45**	(1.90-1.92)	0.8	(0.52-1.24)
township residence (ref: urban)	1.14	(0.72-1.81)	1.31	(0.59-2.90)
rural residences (ref: urban)	1.47**	(1.15-1.88)	0.84	(0.51-1.39)
incomplete secondary educ	1		1	
complete secondary or more	1.46**	(1.13-1.88)	1.05	(0.66-1.67)
university or institute	1.12	(0.74-1.70)	0.35^	(0.12-1.02)
Health Measures				
heart attack diagnosed (ref: no)	1.35	(0.92-1.99)	1.28	(0.50-3.25)
stroke diagnosed (ref: no)	1.18	(0.68-2.06)	2.24^	(0.95-5.30)
missed work from illness (ref:	1.41	(0.87-2.29)	1.88	(0.66-5.41)
perceives health as poor (ref: no)	2.39**	(1.84-3.11)	2.13**	(1.36-3.33)
Health Behavior				
smoker (ref: no)	1.50**	(1.17-1.93)	3.72**	(2.01-6.89)
heavy alcohol cons (ref: no)	0.72	(0.43-1.22)	2.32	(0.59-9.10)
alcohol consumption frequency:none	1		1	
daily or almost daily	1.32	(0.76-2.29)	1.09	(0.20-5.92)
a few times a week	1.13	(0.85-1.50)	0.44	(0.13-1.42)
a few times a month	0.93	(0.69-1.25)	0.58^	(0.33-1.01)
Labor Force Status and Participation				
unemployed	2.46**	(1.63-3.71)	8.07**	(2.25-28.91)
routine/manual worker	0.97	(0.64-1.46)	2.89	(0.03-2.56)
low-mid grade employees	1		1	
intermediate employees/ers	0.58	(0.24-1.38)	3.36	(0.74-15.35)
salariat	0.95	(0.51-1.77)	tf	
caring for someone	4.62	(0.63-33.87)	3.36	(0.74-15.35)
other reasons not particip.	1.42**	(0.96-2.10)	2.46	(0.71-8.50)
note: tf-too few to estimate within this category				
# of subjects	8228		9064	
# of deaths	319		90	
# of obervatins	32697		40203	

References

Abdala, F., Geldstein, R., & Mychaszula, S. (2000). Economic restructuring and mortality changes in Argentina: Is there any connection? In G.A. Cornia & R. Paniccia (Eds.), *The mortality crisis in transitional economies* (pp. 328-350). New York: Oxford University Press.

All-Russian Population Census. (2002). Vol. 3 (Book 1) Education and Training.

Barr, N. (2001). Reforming welfare states in post-communist countries. In L.T. Orlowski (Ed.), *Transition and Growth in Post-Communist Countries: The Ten-Year Experience* (pp. 169-218). Cheltenham, UK: Edward Elgar, 169-218.

Bartley, M., & Plewis, I. (2007). Increasing social mobility: An effective policy to reduce health inequalities. *Journal of the Royal Statistical Society A, 170*, 469-481.

Blanchard, O. (1997). *The Economics of Post-Communist Transition.* Clarendon Lectures in Economics. New York: Oxford University Press. Blazek, J. & Dzúrová, D. (2000). The decline of mortality in the Czech Republic during the transition: A counterfactual case study. In G.A. Cornia & R. Paniccia (Eds.), *The mortality crisis in transitional economies* (pp. 303-327). New York: Oxford University Press.

Blazek, J. & Dzúrová, D. (2000). The decline of mortality in the Czech Republic during the transition: A counterfactual case study. In G.A. Cornia & R. Paniccia (Eds.), *The mortality crisis in transitional economies* (pp. 303-327). New York: Oxford University Press.

Boyle, P., Norman, P. & Popham, F. (2009). Social mobility: Evidence that it can widen health inequalities. *Social Science & Medicine, 68*, 1835-1842.

Brainerd, E., & Cutler, D.M. (2005). Autopsy of an Empire: Understanding Mortality in Russia and the Former Soviet Union. *Journal of Economic Perspectives 19*(1), 107–30.

Carolina Population Center. (2009). Occupational Coding. Retrieved from the University of North Carolina Chapel Hill's Carolina Population Center Website on March 19, 2009: http://www.cpc.unc.edu/projects/rlms/data/occupationalcoding.html

Claussen, B., Smits, J., Naess, O., & Davey Smith, G. (2005). Intergenerational mobility and mortality in Oslo: Social selection versus social causation. *Social Science & Medicine, 61*, 2513-2520.

Cockerham, W. (1999). *Health and social change in Russia and Eastern Europe*. New York & London: Routledge.

Cockerham, W. (2000). Health lifestyles in Russia. *Social Science & Medicine, 51*, 1313-1324.

Cockerham, W. (2006). Class Matters: Health lifestyles in post-Soviet Russia. *Harvard International Review, Spring,* 64-68.

Cornia, G.A. (2000). Short-term, long-term, and hysteresis mortality models: A review. In G.A. Cornia & R. Paniccia (Eds.), *The mortality crisis in transitional economies* (pp. 59-80). New York: Oxford University Press.

Cornia, G.A., Paniccia, R. (1998). The transition's Population crisis: Nuptiality, Fertility, and Mortality Changes in Severely Distressed Economies. In M. Livi-Bacci & G. de Santis (Eds.), *Population and Poverty in the Developing World* (pp. 217-249). Oxford: Clarendon press.

Dahl, E., & Kjaersgaard, P. (1993). Social mobility and inequality in mortality: An assessment of the health selection hypothesis. *European Journal of Public Health, 3*, 124-132.

Davey Smith, G., Hart, C., Blane, D., Gillis, C., & Hawthorne, V. (1997). Lifetime socioeconomic position and mortality: Prospective observational study. *BMJ, 314*, 547.

Denisova, I. (2009). Mortality in Russia: Microanalysis. Centre for Economic and Financial Research at New Economic School Working Paper, No. 128.

Erikson, R., & Goldthorpe, J. (1992). *Changing classes. Stratification and mobility in post-industrial societies.* Oxford: Oxford University Press.

Hart, C., Davey Smith, G., Blane, D. (1998). Social mobility and 21 year mortality in a cohort of Scottish men. *Social Science and Medicine, 47*(8), 1121-1130.

Hemmingsson, T., & Lundberg, I. (2005). Can large relative mortality differences between socio-economic groups aong Swedish men be explained by risk indicator-associated social mobility? *European Journal of Public Health,* 1-5.

Jäntti, M., Martikainen, P., & Valkonen, T. (2000). When the welfare state works: Unemployment and mortality in Finland. In G.A. Cornia & R. Paniccia (Eds.), *The mortality crisis in transitional economies* (pp. 351-369). New York: Oxford University Press.

Krumins, J., & Usackis, U. (2000). The mortality consequences of the transition to market economy in Latvia, 1991-1995. In G.A. Cornia & R. Paniccia (Eds.), *The mortality crisis in transitional economies* (pp. 227-252). New York: Oxford University Press.

Leon, D., & Shkolnikov, V. (1998). Social stress and the Russian mortality crisis. *Journal of the American Medical Association, 279*, 790-791.

Leon, D., Saburova, L., Tomkins, S., et al. (2007). Hazardous drinking and premature mortality in Russia: A population based case-control study. *Lancet, 369*, 2001-2009.

Malyutina, S., Bobak, M., Kurilovitch, S., et al. (2002). Relation between heavy and binge drinking and all-cause abd cardiovascular mortality in Novosibirsk, Russia: A prospective cohort study. *Lancet, 360*, 1448-54.

Martikainen, P., Mäki, N., & Jäntti, M. (2007). The effects of unemployment on mortality following workplace downsizing and workplace closure: A register-based follow-up study of Finnish men and women during economic boom and recession. *American Journal of Epidemiology, 165*(9), 1070-1075.

Nemtsov, A.V. (2003). Alcohol consumption in Russia: A viewpoint on monitoring health conditions in the Russian Federation RLMS. *Addiction 98*, 369-370.

Nilsson, P.M., Nilsson, J., Östergren, P., Berglund, G. (2005). Social mobility, marital status, and mortality risk in an adult life course perspective: The Malmö Preventative Project. *Scandinavian Journal of Public Health, 33*, 412-423.

Perlman, F., & Bobak, M. (2008). Socioeconomic and behavioral determinants of mortality in post-transition Russia: A prospective population study. *Annals of Epidemiology, 18*(2), 92-100.

Power, C., Matthews. S., & Manor, O. (1996). Inequalities in self rated health in the 1958 birth cohort: Lifetime social cicumstances or social mobility? *BMJ, 313*, 449-453.

Riphan, R., & Zimmerman, K. (2000). The mortality crisis in East Germany. In G.A. Cornia & R. Paniccia (Eds.), *The mortality crisis in transitional economies* (pp. 280-302). New York: Oxford University Press.

Rose, D., & Harrison, E. (2007). The European socio-economic classification: A new social class schema for comparative European research. *European Societies, 9*(3), 459-490.

Runciman, G.W. (1971). Relative deprivation and social justice: A study of attitudes to social inequality in Twnetieth-Century England. London: Routledge.

Shkolnikov, V., Andreev, E., Leon, D., McKee, M., Meslé. F., & Vallin, J. (2004a). Mortality Reversal in Russia: The story so far. *Hygiea Internationalis, 4*(4), 29-80.

Shkolnikov, V., Cornia, G.A., Leon, D., & Meslé, F. (1998). Causes of the Russian mortality crisis: Evidence and interpretations. *World Development, 26*(11), 1995-2011.

Shkolnikov, V., McKee, M., & Leon, D. (2001). Changes in life expectancy in Russia in the mid-1990s. *The Lancet, 357*, 917-921.

Shkolnikov, V.M., Chervyakov, V.V., McKee, M., Leon, D. (2004b). Russian mortality beyond vital statistics: Effects of social status and behaviours on deaths from circulatory disease and external causes—a case control study of men aged 20-55 years in Udmurtia, 1998-99. *Demographic Research, S2*(4), 71-104.

Siegrist, J. (2000). Place, social exchange and health: Proposed sociological framework. *Social Science & Medicine, 51*, 1283-1293.

Stern, J. (1983). Social mobility and the interpretation of social class mortality differentials. *Journal of Social Policy, 12*(1), 27-49.

Stillman, S. (2006). Health and nutrition in Eastern Europe and the former Soviet Union during the decade of transition: A review of the literature. *Economics and Human Biology, 4*, 104-146.

Strully, K.W. (2009). Job loss and health in the U.S. labor market. *Demography, 46*(2), 221-246.

Suhrcke, M., Rocco, L., McKee, M., Mazzuco, S., Urban, D., Steinherr, A. (2007). Economic consequences of noncommunicable diseases and injuries in the Russian Federation. Copenhagen: WHO Regional Office for Europe on behalf of the European Observatory on Health Systems and Policies.

Treiman, D. (1977). *Occupational prestige in comparative perspective.* New York: Academic Press.

Vågero, D., & Kislitsyna, O. (2005). Self-reported heart symptoms are strongly linked to past and present poverty in Russia: Evidence from the 1998 Taganrog interview survey. *European Journal of Public Health, 15*(4), 418-423.

Walberg, P., McKee, M., Shkolnikov, V., Chenet, L., Leon, D. (1998). Economic change, crime and mortality crisis in Russia: regional analysis. *BMJ, 317*, 312-318.

Watson, P. (1995). Explaining rising mortality among men in Eastern Europe. *Social Science & Medicine, 41*(7), 923-934.

Table 1. Cox Proportional Hazard Risks of Death in Russia for Men 65 years old and younger, 1994-2005

	1. Mobility and control variables*	2. Controlling for past alcohol consumption	3. Controlling for past health	4. Controlling for origin state	5. Continued impact of mobility
Relative risks according to downward shift in the quartile location of real equivalent household income					
Men: no downward mobilty	1	1	1	1	1
Men: downward mobilty	1.39* (1.08-1.78)	1.29* (0.99-1.65)	1.37* (1.07-1.76)	1.59** (1.21-2-10)	1.29* (1.00-1.67)
Relative risks according to downward shift in subjective ranking of personal wealth					
Men: no downward mobilty	1	1	1	1	1
Men: downward mobilty	1.43** (1.13-1.80)	1.30** (1.02-1.65)	1.42** (1.12-1.79)	1.45** (1.12-1.88)	1.40** (1.07-1.83)

Note: Statistical significance: * =5%, ** =1%. Results are adjusted for health conditions, health status, alcohol and smoking status, urban/rural residence, union status, education, labor force status and occupational class.

Table 2. Cox Proportional Hazard Risks of Death in Russia for Men and Women 65 years old and younger, 1994-2005

	Relative risks according to experiencing unemployment			
	Unemployment and control variables*	Controlling for past alcohol	Controlling for past health	Continued impact of unemployment
Men: not unemployed	1	1	1	1
Men: unemployed	1.78** (1.29-2.47)	1.78** (1.28-2.47)	1.80** (1.30-2.50)	1.67** (1.29-2.17)
Women: not unemployed	1	1	1	1
Women: unemployed	2.95** (1.54-5.65)	2.49* (1.22-5.06)	3.05** (1.59-5.84)	2.24** (1.35-3.76)

Note: Statistical significance: * =5%, ** =1%. Results are adjusted for health conditions, health status, alcohol and smoking status, urban/rural residence, union status, education, and labor force status.

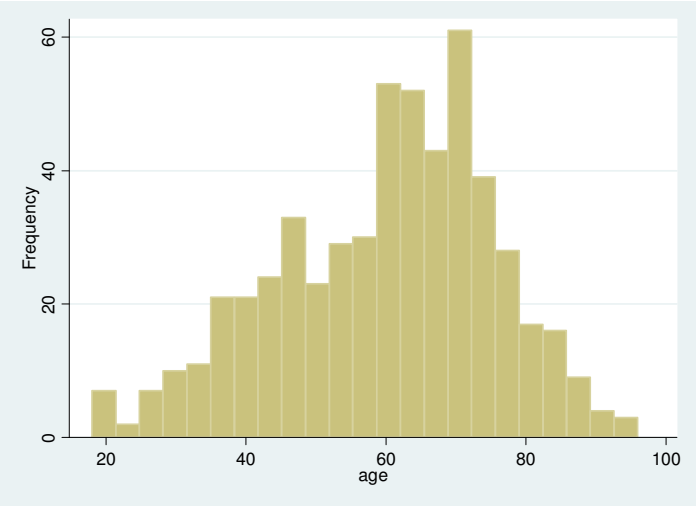

Figure 1. Frequency of deaths by age for men

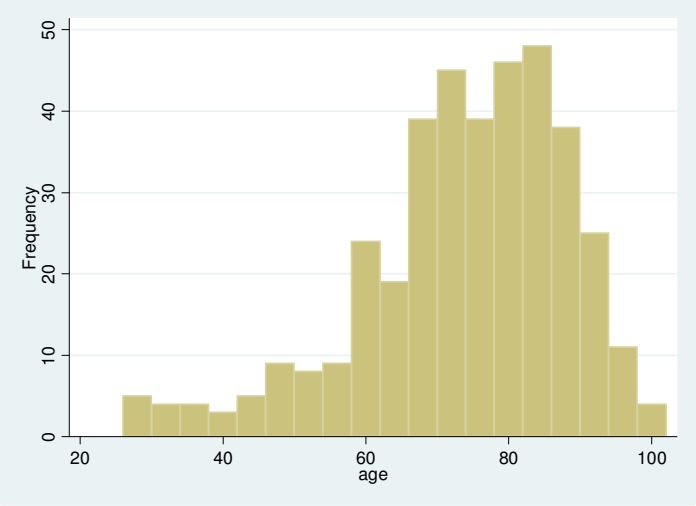

Figure 2. Frequency of deaths by age for women

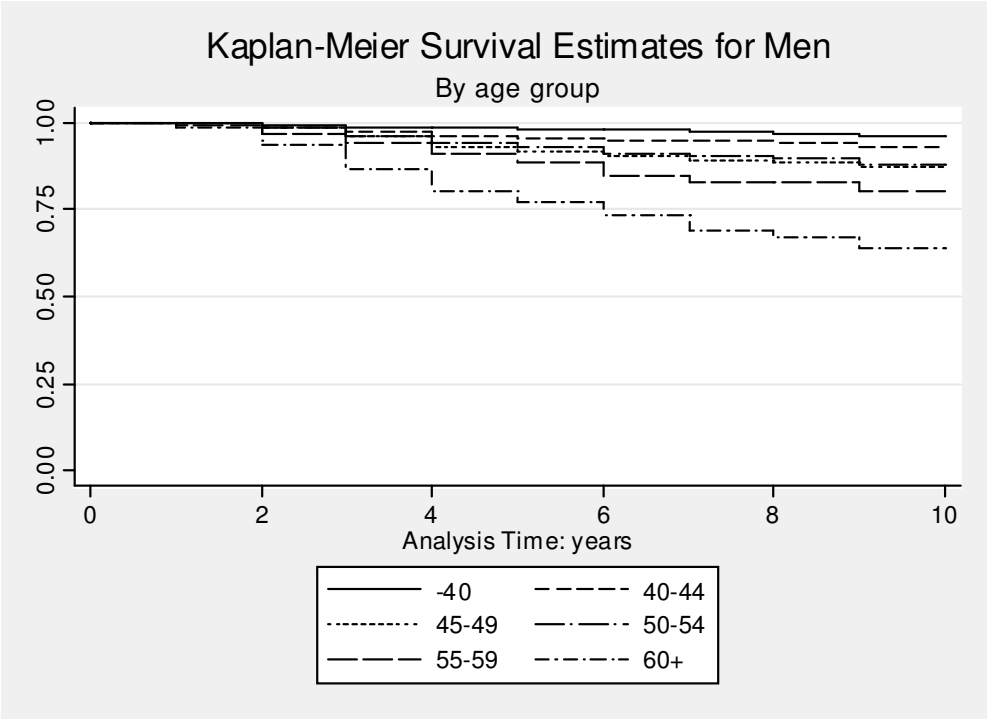

Figure 3 Survival estimates of men in the RLMS sample, 1994-2005

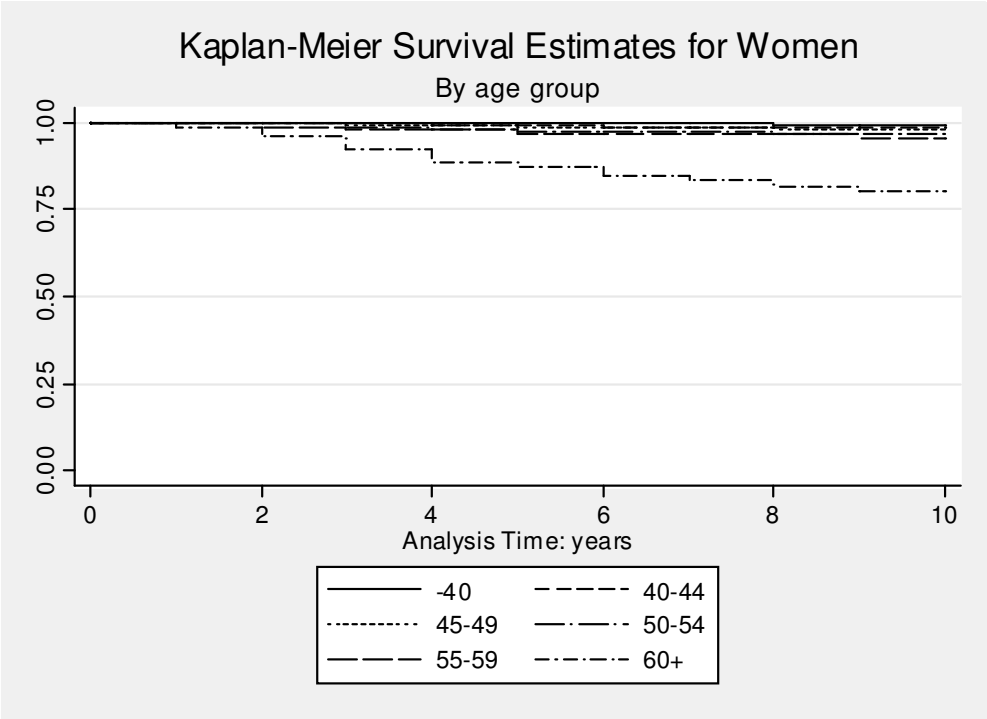

Figure 4 Survival estimates of women in the RLMS sample, 1994-2005

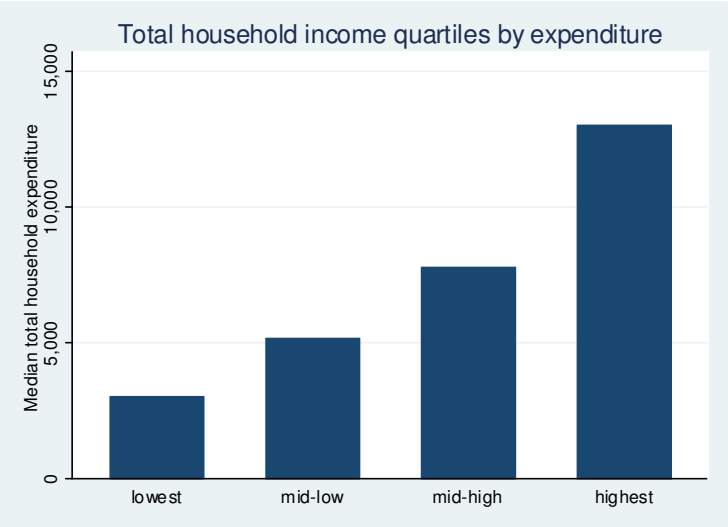

Figure 5 The gradient in income according to expenditure
Source: author's calculations based on RLMS data

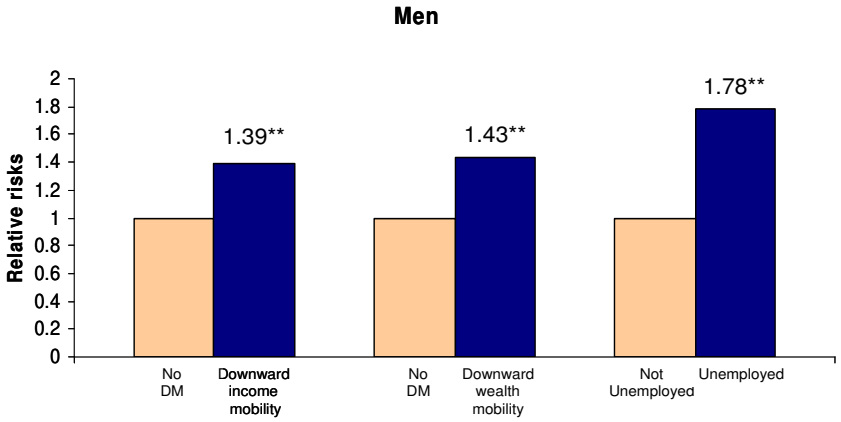

Figure 6. The independent impact of both forms of mobility and unemployment on the death risks of men 65 years of age or younger

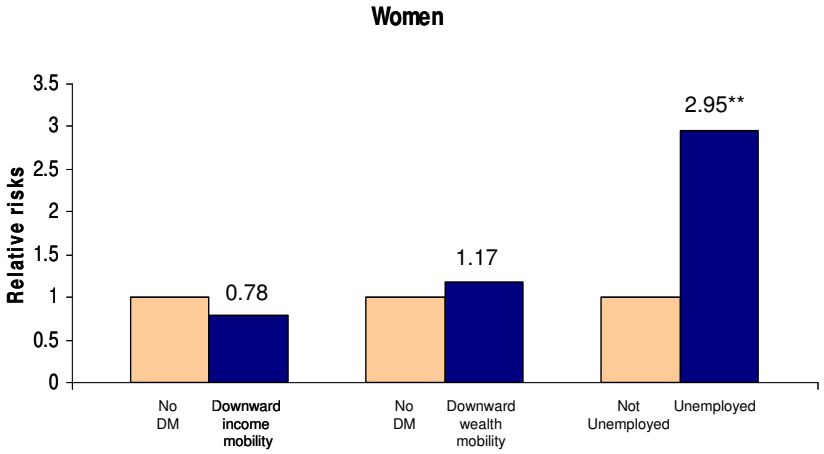

Figure 7. The independent impact of both forms of mobility and unemployment on the death risks of women 65 years of age or younger