

A prospective analysis of labour market status and self-rated health in the United Kingdom and Russia¹

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ABSTRACT

Comparing prospective data from the United Kingdom and Russia, this paper analyses whether the association of labour market status, and particularly unemployment, with subsequent health varies by the level of state protection provided to the unemployed. While the UK's unemployment welfare regime is classified as providing minimal protection, the Russian regime is sub-protective. Employing Cox duration analysis upon data from the Russian Longitudinal Monitoring Survey and the British Household Panel Survey for the period 2000–2007, this study finds that labour market status and economic circumstances independently predicted individual-level declines in self-rated health and, contrary to expectations, the associations of unemployment with health decline were similarly sized in the two countries.

JEL CLASSIFICATION: I1, I10, I12, D31, J18

KEY WORDS

Health inequalities, material deprivation, unemployment, survival analysis, Russian Longitudinal Monitoring Survey, British Household Panel Survey.

1. INTRODUCTION

Individuals' social characteristics, embedded in diverse national contexts, harm and promote their health and wellbeing. In Europe, studies have described the unequal distribution of health in relation to a range of social and economic characteristics, including education level, income, social class and employment status. This concerns both countries in Western Europe (Groffen et al., 2008; Schrijvers et al., 1999; Torssander and Erikson, 2010) and Eastern Europe (Bobak et al., 1998; Nicholson et al., 2005; Leinsalu et al., 2007; Bessudnov, McKee and Stuckler, 2011). In post-Soviet countries, economic transformations taking place over the last two decades have generated new inequalities; one example is the dramatic development of unemployment (Brück et al., 2010). The association between unemployment and poor health is well documented (Bartley, 1994; Cohen et al., 2007; Denisova, 2010; Dorling, 2009; Gunnell et al., 1999; Perlman and Bobak, 2009), and unemployment may now have an important role in generating health inequalities in post-Soviet countries, having been implicated in the region's health crises (Stuckler, King and McKee, 2009).

Whether the well-documented cross-sectional and longitudinal relationship between unemployment and health reflects the causal influence of unemployment upon health is an open question, complicated by endogeneity. Unobserved individual characteristics such as education level may jointly affect unemployment and health (a phenomenon also described as confounding or indirect selection). Equally, health status may increase the risks of becoming or remaining unemployed (reverse causation or direct selection). Studies examining the degree to which the relationship between unemployment and health is entirely explainable by selection have reported inconsistent findings. Results from studies with robust longitudinal designs, generally using instruments such as plant closures, from Finland (Böckerman and Ilmakunnas, 2009) and Germany (Schmitz, 2011) suggested that selection into unemployment entirely explained the unemployment-health relationship, similar studies in the United Kingdom (Steele, French and Bartley, 2013; Gathergood, 2013) and Denmark (Browning and Heinesen, 2012) found otherwise, and studies from Austria (Kuhn, Lalive and Zweimüller, 2009) and the United States (Sullivan and von Wachter, 2009; Kahn, 2010; Salm, 2009) have reported inconsistent results. To my knowledge, studies examining the impacts of unemployment on health after adequately addressing endogeneity have not been performed using prospective data from Russia, but a study of non-payment of pensions, an exogenous income shock, was associated with reduced health service use and increased mortality (Jensen and Richter, 2004). Although the question remains open, there is evidence that unemployment affects health over-and-above effects that can be attributed to endogeneity (Roelfs et al., 2011).

It is likely that unemployment impacts on health via a variety of mechanisms, including health lifestyles, poverty, the psychological impacts of worklessness and impacts on the rest of the work career (Komarovskiy, 2004; Daly and Delaney, 2013; Flint et al., 2013; Bartley, 1994; Gangl, 2006), providing a range of points of intervention (Katikireddi et al., 2013). An important pathway to ill health is represented by materialist mechanisms, in which lack of economic resources exposes individuals to poor housing and food, dangerous work and difficulties in accessing services (Lynch et al., 2000). Therefore, one mechanism through which unemployment might affect individual health and well-being is through its strong relationship with reduced earnings and poverty (Bailey, 2006; Gallie, Paugam and Jacobs, 2003; Pantazis, Gordon and Townsend, 2006).

It is conceivable therefore that contextual differences between welfare states might expose unemployed people to a greater or lesser extent to the risk of poverty, and therefore to ill health (Kaplan, 2004; Lundin and

Hemmingsson, 2009; Browning and Heinesen, 2012). In other words, the impact of unemployment upon individual health may vary according to the level of unemployment protection provided by the state, through the replacement to some degree of lost earnings. Therefore, a comparison between countries with contrasting welfare states, a factor which is exogenous to individuals' health, may highlight how between-country variations interact with individual characteristics to affect health (Burkhauser and Lillard, 2005).

Such concerns are examined in a broad area of research which analyses the role of macro-level economic factors in generating health inequalities (Bambra, 2011). Characteristics of welfare states are important determinants of health, which can moderate individual-level social determinants of health such as income or education level (Phelan, Link and Tehranifar, 2010). In this way, between-country comparisons can illuminate the underlying mechanisms generating health inequalities and suggest points of intervention. Therefore, an internationally comparative approach is taken in this study, which seeks to describe the relationships between labour market status and health in two contrasting European societies: the United Kingdom and Russia, using complementary household panels.

Countries' labour market policies can be classified into *unemployment welfare regimes* according to the level of protection they provide for unemployed people, regarding both the completeness of unemployment coverage and the level of income replacement (Gallie and Paugam, 2000). In terms of unemployment welfare regimes, the UK is classified as *liberal/minimal*: offering low levels of state protection to unemployed people, which leave them at risk of poverty, and providing weak active employment policies (Gallie and Paugam, 2000; Gangl, 2006). Out-of-work individuals in the UK in the 2000s were eligible to receive a range of benefits, including housing benefit and income support payments, alongside unemployment benefit, called the job seeker's allowance. In order to receive any unemployment benefit, individuals must be: registered at a job centre and be capable of, available for, and actively seeking employment; working under 16 hours a week; and have a current jobseeker's agreement. In order to receive the contribution-based job seeker's allowance, national insurance contributions equivalent to 25 and 50 times the lower earnings limit must have been paid in the last 2 years (International Social Security Association, 2004). While the contribution-based job seeker's allowance is payable for up to six months, the income-based job seeker's allowance is a means-tested benefit which can last longer (Walsh 2011). The basic level of the job seeker's allowance in 2010 corresponded to 10.9 percent of average earnings (Walsh 2011).

Although Gallie and Paugam's typology of unemployment welfare regimes did not extend to Eastern Europe, the Russian welfare state in the 2000s would likely be classified as *sub-protective*, alongside those in Southern Europe, in which unemployment coverage is incomplete, poverty relief is poorly targeted, the unemployed are offered less than the minimum for survival and active employment policies are almost inexistent (Lokshin and Ravallion, 2000; Cook, 2007). The eligibility rules to receive unemployment benefit in 2004 were that individuals must have registered at an unemployment office, have had 26 weeks of full-time employment in the last 12 months (or the 26-week equivalent for part-time work), and be able and willing to work (International Social Security Association, 2004). Between 1999 and 2008, the proportion of the average monthly wage provided by the average monthly unemployment benefit dropped from 25.5 percent to 7.4 percent (Gimpelson and Kapeliushnikov, 2011). The minimum level of unemployment benefits, provided to 48.1 percent of unemployment beneficiaries in 1999, amounted to only 5.3 percent of the average wage, and only 8.3 percent of the subsistence minimum (Tchetvernina et al., 2001). After a maximum period of two years, individuals were no

longer eligible for unemployment benefit and received social assistance (Tchetvernina et al., 2001). The low level of benefit provided has discouraged individuals from signing on; the difference between claimant (registered) unemployment and the level of unemployment measured according to the International Labour Organization definition has varied from seven-fold to just under three-fold during the 2000s (Gimpelson and Kapeliushnikov, 2011).

Therefore, the welfare package provided to unemployed people in Russia will likely be less protective than in the UK, which one could hypothesize might lead to greater potential impacts upon health in Russia of absence from the labour market in general and unemployment in particular. In both cases, the hypothesized intermediary mechanism will be the economic impacts of unemployment, represented by the materialist pathway between labour market status and health.

The link between individual financial circumstances and health has been demonstrated in both countries. Income inequalities in health are large in Britain compared to other European countries (Mackenbach et al., 2008). In post-communist European societies, health inequalities have grown over the last twenty years (Murphy et al., 2006), as have income inequalities and absolute poverty rates (Round and Kosterina, 2005; Federal'naja sluzhba gosudarstvennoj statistiki, 1997), yet health inequalities are often smaller than might be expected (Bambra and Eikemo, 2009; Mackenbach et al., 2008; Eikemo et al., 2008). In the UK, the link between unemployment and poverty is particularly strong: moving into and out of unemployment are the main causes of leaving and entering poverty, and unemployed people in the UK have higher risks of having an income under 60 percent of the median national income than those living elsewhere in Western Europe (Bailey, 2006; Gallie, Paugam and Jacobs, 2003; Pantazis, Gordon and Townsend, 2006). In Russia, unemployed individuals were exposed to high rates of poverty in the early 2000s: almost a third had monetary incomes that were less than half of the government's minimum level for subsistence (Federal'naja sluzhba gosudarstvennoj statistiki, 2003), although they may have been receiving additional non-monetary incomes. To conclude and resume the argument thus far, in both countries it can be hypothesized that unemployment will have impacts on health that can be accounted for, at least in part, by individuals' economic circumstances. These links between unemployment and health may vary by welfare state regime, since they differ in the degree of income protection provided to individuals who are not gainfully employed.

Disentangling the influences of public policies and socio-economic characteristics through international comparison is a difficult task, requiring harmonization of the data to ensure that the same concepts are being measured in each country (Burkhauser and Lillard, 2005). It is particularly testing for societies that differ as much as the UK and Russia; however, suitable longitudinal data for these countries are available. Two household panel surveys were chosen for the study, which have a suitable range of similar variables allowing *ex post* harmonization: the British Household Panel Survey (BHPS) and the Russian Longitudinal Panel Survey (RLMS-HSE).

Harmonization of the health variable is particularly important. Health can be measured in a variety of ways; here, self-rated health was used, a variable which has been shown to be a valid single-item measure of general physical and mental health across national contexts which is both convenient to collect and predicts mortality (Singh-Manoux et al., 2006; Quesnel-Vallée, 2007; Idler and Benyamini, 1997; DeSalvo et al., 2006). Self-rated health is a useful early indicator of health difficulties, as it may be intermediary in the unemployment–mortality relationship (Åhs and Westerling, 2006; Johansson and Sundquist, 1997). However, it is not advisable to

directly compare self-rated health between Britain and Russia in a cross-sectional analysis, because individuals' declarations of their health can be affected by differences in question wording, use of language, as well as varying expectations for health (Salomon, Tandon and Murray, 2004). Therefore, the study design used here analysed *change* in health over time, for participants from both countries who originally reported that their health was good or fair.

Consequently, taking a longitudinal and comparative approach, this study examined associations between labour market status and declines in health in the UK and Russia, analysing unemployment in particular, and whether individuals' economic circumstances accounted for any relationships. Three research questions were posed:

- 1) Is there an association between labour market status and subsequent health decline?
- 2) Is this association accounted for by individuals' economic circumstances?
- 3) Does the relationship between labour market status and subsequent health decline differ between the UK and Russia?

This paper contributes to the literature on the social determinants of health inequalities within an internationally comparative perspective. Within a framework of welfare regime theory, it extends comparative analyses examining the relationship between unemployment and health to the Russian Federation. Using harmonized and prospective panel data from the UK and Russia, the study tests the hypothesis that unemployment is associated with the development of poorer health in Russia than in the UK, as might be predicted from the sub-protective nature of the welfare provided to unemployed people in Russia. By including possible confounding variables and lagged health in the longitudinal analysis, endogeneity bias is addressed to some extent. In addition, the paper examines the extent to which the impact of unemployment upon individuals' financial circumstances might be a pathway accounting for the unemployment-health relationship.

The paper is organized as follows: Section 2 discusses the methods used to estimate the risk of self-rated health worsening, introducing the datasets, measures and estimation techniques. The results are presented in Section 3, which describes similarly sized associations between labour market status and declining self-rated health in Russia and the UK, associations which were accounted for by economic circumstances only to a limited degree. Section 4 discusses possible interpretations of these results, concluding that longitudinal and international comparison of health inequalities is a challenging but promising research approach.

2. METHODS

2.1. DATA

This prospective and comparative analysis of the UK and Russia draws on two panel datasets: the British Household Panel Survey and the Russia Longitudinal Monitoring Survey. Both datasets are nationally representative, surveyed at household level and contain at least 4000 households. Each poses a wide range of questions on social, economic and health factors.

The Russian data are from eight rounds (2000–2007) of Phase II of the Russian Longitudinal Monitoring Survey (RLMS-HSE). It is a nationally representative panel study of around 4000 households created through a

multistage probability sample; full details of the Russian Longitudinal Monitoring Survey are available elsewhere (RLMS-HSE, 2013). Households and individuals are re-interviewed annually, although households that move away are not necessarily followed up (Perlman and Bobak, 2008).

The British data are from eight waves (2000–2007) of the British Household Panel Survey (BHPS). It is a nationally representative sample of over 5000 households living in England, Wales, Scotland and Northern Ireland (full details are available in Brice et al., 2009). The initial sample was a stratified clustered design; all residents present at the addresses originally selected became panel members and were re-interviewed in successive years. About 10 000 individuals are interviewed each year, and if they leave their original households they are followed to their new households, within which all the adult household members of the new households are then also interviewed.

2.2. VARIABLES

The variables, drawn from both household and individual surveys, were harmonized as closely as possible between the Russian and British datasets. Information about the variables is provided in Table 1. The outcome variable was self-rated health, which was measured similarly in each survey. Gender and year of birth was obtained from each survey and age-groups were constructed for the descriptive analyses according to the person's age in 2000.

(Table 1 about here.)

Participants' marital status, education level and labour market status were obtained from both panels and were harmonized as closely as possible (see Table 1). In relation to labour market status, participants were re-classified as 'other' if they were studying in educational establishments, long-term sick and disabled, on government training schemes, in military service or gave an activity which was unclassifiable. A single 'unemployed' category was available in the BHPS; in the RLMS-HSE, both out-of-work individuals who were looking for work and who were not looking for work were included in the unemployed category, following Bamba & Eikemo (2009).

Financial adequacy was measured using three variables in order to capture diverse aspects of individuals' financial circumstances, and because income can be a poor measure of household welfare, particularly in Russia (Rose and McAllister, 1996). These variables were adjusted household income, number of assets owned by the household and a subjective measure of financial adequacy (described fully in Table 1). Incomes were converted into quintiles for each year of the survey and the assets variable was grouped into four categories (0–2 items, 3 items, 4 items and 5–6 items).

Participants were included in the analysis if they had provided data for all variables used in the analysis from any two consecutive questionnaires between 2000 and 2007. They were excluded if they were aged under 18 years or reported poor or very poor health at baseline.

2.3. ANALYSIS

This study takes a longitudinal and comparative approach, using duration (survival) analysis.² Briefly, the time to event is modelled separately in Britain and Russia, the event being the first occasion of declaring poor or very poor health for individuals who earlier reported very good/excellent, good or fair/average health. Duration analysis is suited to longitudinal analyses of repeated measures microdata for a number of reasons. The technique handles right censoring, in which individuals are observed for differing lengths of time as a result of sample attrition. It can also take account of changes in covariates over time.

The hazard of declaring poor or very poor health is modelled from time $t=0$ to $t=T$, where T is the final value for that observation, either because the participant experiences the event of declaring poor or very poor health or because they are not observed beyond this point (in other words, they have been right-censored). Consequently, individuals who are observed up to 2007, the end of the follow-up period, and do not experience an event are censored in that year.

Descriptive statistics have been presented using person-time rates, describing the number of events per 100 person-years, for each covariate (Tables 2 and 3). Subsequently, Cox regression models with time-varying covariates were estimated in Stata 12.1 (StataCorp, 2011). Cox modelling is a semi-parametric method which leaves the shape of the baseline hazard unspecified, which is suitable here because the central interest is to understand how the hazard changes in relation to the values of the covariate and there are no *a priori* reasons for choosing a specific parametric model (Blossfeld, Golsch and Rohwer, 2007, p. 223). Tied durations were resolved using the Efron method and robust standard errors used to accommodate clustering within households at the current wave.

For each year, the hazard rate was modelled from the values of the fixed covariates as well as from the values of the time-varying covariates from the previous year. Values for time-varying covariates which corresponded to the previous year, in other words the period $t-1$, were used to ensure that the change to the value of the time-varying covariate took place before the event, assuming no measurement errors related to their timing (Box-Steffensmeier and Jones, 2004, p. 110). This procedure also controls for health status during the previous wave, thereby reducing the impact on the results of health selection of individuals into unemployment or inactivity.

The hazard function, h , at time t for a simplified model which has one fixed covariate, x_1 , and one time-varying covariate, $x_2(t-1)$, would be estimated as follows:

$$h(t) = h_0(t) e^{\beta_1 x_1 + \beta_2 x_2(t-1)}$$

where β_1 and β_2 represent the coefficients which alter the hazard rate in relation to a fixed and a time-varying covariate, respectively, and h_0 is the baseline hazard (Box-Steffensmeier, 1996). The estimation procedure for time-varying covariates was carried out over two steps: firstly, the follow-up time for each participant was divided up into years. Estimation was carried out according to the characteristics of the covariates relevant to

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An exposition of duration analysis in general and Cox modelling in particular is provided in Blossfeld et al. (2007) while the use of time-varying covariates is succinctly described in Dekker et al. (2008).

that year. In a second step, a weighted average, expressed as a hazard ratio, was calculated from the results from each of the years (Dekker et al., 2008). This means that the model examines short-term effects, within one year, of the time-varying covariates.

In Model 1, predicting the event of falling into poor or very poor health, only control variables were included: gender and age as fixed covariates, as well as the lagged time-varying covariates of educational level, marital status and health. Model 2 displays the associations between labour market status and subsequent self-rated health in each country when lagged labour market status had been added to the control variables. In Model 3, variables indicating recent economic circumstances were added to the previous covariates. This final model displays whether any relationship between labour market status and self-rated health persisted after adding measures of economic circumstances. The fit of the models was assessed using Akaike's Information Criterion (AIC), which balances the likelihood of the model against the number of parameters in the model (a parsimony criterion). Smaller values indicate better model fit (Tabachnick and Fidell, 2006).

The results from the Cox models are displayed as hazard ratios with 95 percent confidence intervals. The hazard ratios for covariates can be compared between the two countries, because they are estimated as relative increases or decreases in risk in relation to the same reference group in each country, such as the risk for unemployed participants compared to the risk for gainfully employed participants.

3. RESULTS

3. 1. DESCRIPTION OF THE SAMPLES

Participants providing at least two consecutive years of data numbered 10 739 persons in the Russian sample and 15 978 persons in the British dataset (Tables 2 and 3). Women slightly predominated in both surveys; average age was lower in the Russian sample. In both surveys, most person-years were spent in marriage. Levels of education in the British sample were lower than in the Russian sample. The Russian respondents rated their health worse than the British respondents: most person-years in the British cohort were spent in 'good' health, compared to 'average, not good but not bad' health in the case of the Russian respondents.

(Tables 2 and 3 about here.)

Throughout the course of the survey, most person-years in both countries were spent in gainful employment. The proportions of person-years spent in other activities were similar between the cohorts, excepting unemployment. Specifically, in the RLMS-HSE almost 11 percent of the total person-years were spent in unemployment compared to only three percent for British participants.

In contrast, the differences between the samples in terms of economic circumstances are large. Russian respondents expressed worry about being able to afford necessary expenses during about 70 percent of the person-years. In contrast, only around five percent of the time did British respondents state that they were finding their current financial situation very or quite difficult. Five or six assets were owned by the majority of British respondents; compared to a minority of nine percent in the Russian sample.

3.2. BIVARIATE ASSOCIATIONS

The rate of experiencing the event of entering poor or very poor health per 100 person-years in the Russian sample was 5.0 (95% confidence intervals: 4.8; 5.3) (Table 3), substantially higher than the rate in the British sample (3.9, 95% CI: 3.7; 4.0) (Table 2). This result, directly comparing reported change in health in Britain and Russia, should be interpreted with caution because individuals in one of the countries may be more responsive on average to adverse health shocks when reporting self-rated health (Gunasekara, Carter and Blakely, 2012).

In terms of the socio-demographic variables, in both countries, women had higher rates of decline in self-rated health than men, as did older respondents, with the age gradient being particularly large in Russia. Similar variations in rates by marital status were observed in both the UK and Russia, with unmarried participants reporting lower rates and widowed participants higher rates, likely reflecting variations in the average ages of these groups in both samples. There was a gradient in failure rates in both samples by level of education: participants who had higher level qualifications had lower rates of subsequently declaring poor or very poor health.

Lagged self-rated health was strongly associated with the risk of subsequently declaring poor health: participants reporting 'excellent' or 'very good health' had the lowest rates of failure in both countries, with a rate of 1.3 per 100 person-years (95% CI: 0.7; 2.6) in the RLMS-HSE and 1.2 (95% CI: 1.1; 1.4) in the BHPS.

There were differences in rates by labour market status at the previous wave. Participants who were in work or looking after the home and family reported lower rates of subsequent health decline in both Russia and the UK, while retired and unemployed people were more vulnerable to reporting poor or very poor health during follow-up.

In Russia, the relationship between health decline and material deprivation appeared to be graded; in the UK, participants having fewer than five or six assets had significantly higher rates of experiencing the event. The relationship between perceived financial circumstances and decline in health was graded in the British data but not in Russia. In both countries, there was a linear relationship between income and rates of decline in self-rated health, although this was less consistent in the Russian case.

To conclude this section, differences in rates of entering poor or very poor health were observed in both the UK and Russia in relation to labour market situation and financial adequacy. In the next section, multivariable modelling will be carried out in order to determine whether these associations are robust to the inclusion of possible confounders, including socio-demographic variables and earlier health, and to examine the associations between labour market status, economic circumstances and declines in health in the two countries.

3.3. MULTIVARIATE RESULTS

3.3.1 THE UK

Model 1 examined whether the risk of declaring poor or very poor health was associated with gender, age, marital status, education level and health (Table 4). Hazard ratios were significantly and substantially larger for British participants who were female, older and who were divorced/separated or widowed. Participants reporting

good or excellent health as well as those with higher or further education qualifications had a lower risk of subsequent health decline.

(Table 4 about here.)

Model 2 additionally included labour market status. Compared to the reference group of gainfully employed participants, retired and unemployed individuals as well as those classified as ‘other’ had higher rates of subsequently declaring poor or very poor health, but not individuals looking after the family or the home. With a hazard ratio of 1.89 (95% CI: 1.57; 2.27), unemployed individuals had almost double the risk of gainfully employed individuals of declaring poor or very poor health over the next year. Answering the first research question, these results indicate associations in the British sample between labour market status and subsequent self-rated health.

Model 3 added the three measures of economic circumstances in order to ascertain whether these accounted for the associations between labour market status and health decline into poor or very poor health. Perceived financial situation and number of assets, but not income, were associated with declining health. In terms of the second research question, whether this association was accounted for by individuals’ economic circumstances, inclusion of economic circumstances slightly reduced the hazard ratios for being in the unemployed, retired, or other categories, but in each case they remained significantly and substantially greater than one. This indicates that individuals’ economic circumstances do not account for the relationship between labour market status and health in Britain.

3.3.2. RUSSIA

Much as in the British sample, in Model 1, Russian participants who were female, older, divorced or widowed had higher rates of subsequent ill-health, although these associations were only significant in the case of age (Table 5). In addition, never married respondents reported higher rates of subsequent poor or very poor health. Participants reporting good or very good health and higher levels of education had a lower risk of health decline.

(Table 5 about here.)

After inclusion of labour market status in Model 2, there was little change in these associations, apart from a decline in the hazard ratio for never married individuals. In the Russian case, all participants outside gainful employment were at higher risk of developing poor or very poor self-rated health. The hazard ratio for unemployment was smaller in the Russian case, at 1.50 (95% CI: 1.26; 1.79), than in the British sample. These results answer the first research question, indicating that labour market status and subsequent decline in self-rated health are associated in Russia.

Introducing measures of financial circumstances into Model 3 changed the hazard ratios for labour market status little, indicating that financial circumstances do not account for the relationships between labour market status and health in Russia. The associations between financial circumstances and subsequent health in the fully adjusted model were not significant.

The third research question asked whether the relationship between labour market status and self-rated health differed between the UK and Russia. The findings presented in Tables 4 and 5 indicate that unemployment and retirement were associated with increased risk of subsequent health decline in both the UK and Russia, with

coefficients that, at the 95% confidence interval, are similarly sized. In Russia alone, looking after the home or family was associated with increased risk of health decline.

4. DISCUSSION

4.1. PRINCIPAL FINDINGS

This study used Cox duration analysis to compare panel data from the UK and Russia in order to examine whether differences in unemployment welfare regime were reflected in differing risks of health decline among individuals according to their labour market status. In particular, it examined whether: (1) labour market status predicted increased rates of decline in self-rated health, (2) the relationship between labour market status and subsequent risk of health decline was independent of a range of economic circumstances and (3) these relationships varied between the two countries.

In both Russia and the UK, countries with differing unemployment welfare regimes, study participants who were unemployed or retired had a raised risk of developing poor health in both countries. These associations were only slightly reduced after taking various aspects of individuals' economic circumstances into account, indicating that labour market status and economic circumstances are independent social determinants of health in both countries. In Russia alone, participants who were not gainfully employed because they were looking after the family or the home had a markedly increased risk of health decline, which might suggest the importance of market ties in Russia to protect against declining health.

The finding of associations between labour market status and subsequent health in both Britain and Russia corresponds to reports from the literature, in particular concerning the raised risk of ill health associated with unemployment in both Eastern and Western Europe (Bartley, 1994; Cohen et al., 2007; Denisova, 2010; Dorling, 2009; Gunnell et al., 1999; Perlman and Bobak, 2009). Adjusting for a range of financial characteristics did little to reduce the risk associated with unemployment, suggesting that other pathways, such as the psychological impact of unemployment (Daly and Delaney, 2013; Flint et al., 2013; Gallie and Paugam, 2000) or selection into unemployment (Lundin et al., 2010), may have substantial roles.

After adjustment for education level and demographic characteristics, the size of the increased risk for unemployed participants compared to gainfully employed participants did not differ significantly between the two countries. Contrary to expectations, the increased risk associated with unemployment was slightly, but non-significantly, higher in the British panel than in the Russian panel. Therefore, the hypothesis that unemployment for British respondents would be less damaging to their health as a result of the country's more protective welfare state provision is not supported by the findings presented here. There has been little research in this area, but a recent review of studies examining the magnitude of the unemployment-mortality association failed to find statistically significant differences between countries with contrasting national health and welfare systems such as the USA and Scandinavian nations, despite high levels of income protection in Scandinavia (Roelfs et al., 2011). In the same vein, a cross-sectional study using the European Social Survey found the surprising finding of smaller negative associations between unemployment and health in countries from the Eastern region of the EU than in Britain and Ireland (Bambra and Eikemo, 2009). These results suggest that pathways other than the impact of unemployment upon economic well-being may be important in driving unemployment-related health decline. Bambra and Eikemo (2009) suggest that material and non-material

support coming from other sources, such as family members, may be an important factor in Eastern Europe, as has been the case historically (Bobak et al., 1998; Ledeneva, 1998).

An alternative explanation is that this finding is the result of artefact, due to the rate of unemployment being lower in the UK than in Russia. Associations between unemployment and ill health have been found to vary according to the level of unemployment (Crawford and Prince, 1999; Milner, Page and LaMontagne, 2013), albeit inconsistently (Åhs and Westerling, 2006); it is possible that being unemployed in the UK consequently carries a greater stigma and mental burden or that unemployed individuals were more strongly selected than in Russia (Martikainen and Valkonen, 1996).

4.2. STRENGTHS AND LIMITATIONS

Taking a social determinants of health perspective, this study compares two countries with contrasting unemployment welfare regimes. The interest of the study lies in its internationally comparative approach, using two harmonized and prospective panels to test for the existence of welfare regime effects in the unemployment-health relationship. In order to establish whether participants' economic circumstances could be implicated in the relationship between unemployment and subsequent health, a wide range of covariates were used: income, material deprivation and a subjective assessment of financial status. In addition, it was possible to control for age, gender, marital status, education level and initial health, all possible confounders of the relationship between unemployment and subsequent self-rated health.

However, certain difficulties limit the interpretation of the results. Firstly, this study appropriately employed a Cox model with time-varying covariates for those covariates likely to change over time, but a consequence of this modelling strategy is that they may not now be entirely exogenous (Box-Steffensmeier and Jones, 2004, p. 113; Blossfeld, Golsch and Rohwer, 2007, p. 267). For example, individuals who are in poorer health may be more likely to become unemployed or suffer difficult economic circumstances. Although the inclusion of a lagged measure of self-rated health attenuates this possibility to some degree, endogeneity bias is an important limitation to causal inference.

Secondly, this study has compared two countries in Europe that provide relatively little unemployment protection. Extending it to include a country with an employment-centred or universal unemployment welfare regime would test whether more substantial social protection or greater provision of active labour market programs for unemployed people alter the links between labour market status, poverty and health, as has been suggested in recent work (Stuckler et al., 2009; Lundin and Hemmingsson, 2009).

Thirdly, harmonizing data from two very contrasting European societies is a testing task. Projects such as the Cross-National Equivalent File, which the BHPS is a member of and which the RLMS-HSE has recently joined, provide opportunities for researchers to use harmonized variables, which greatly facilitate international comparative work (Burkhauser et al., 2000). However, certain variables, such as self-rated health, which is widely used in international surveys as a single-item measure of health, are vulnerable to varying norms or expectations between countries about health, which could affect individuals' responses. A similar problem may affect individuals' interpretations of labour market status categories. It would aid comparative analysis if the two panel surveys could include a parallel set of anchoring vignettes which would enable self-reports of

variables such as health status to be positioned on a comparable scale between individuals (Salomon, Tandon and Murray, 2004).

Lastly, important variables have been omitted from the analysis, particularly regarding the Russian data. It has been shown that late payment of wages and receiving wages in kind are associated with mortality in Russia, but it was not possible to include these variables as there were no British equivalents (Perlman and Bobak, 2009). Similarly, in Russia, individuals may be sent on lengthy unpaid administrative leave, but are still nominally in work and are likely to declare themselves as gainfully employed (Füllsack, 2001). These factors may have harmed gainfully employed participants' finances and health, thereby reducing the relative impact in Russia of unemployment. Similarly, examining the social and material support provided by friendship and kin networks might help to explain the greater than expected resilience in the Russian sample (Gerry and Li, 2008). Further research could examine the role of social relations in buffering the impact of unemployment in different country contexts, along the lines of a recent study comparing Sweden and Ireland (Strandh et al., 2013).

4.2. CONCLUSIONS

This study used prospective harmonized panels to analyse the dynamics between labour market status and health in two countries with contrasting welfare states, the UK and Russia. It showed that labour market status and economic circumstances are associated independently with subsequent health in both Russia and the UK. Despite having differing unemployment welfare regimes, the associations between unemployment and subsequent poor health were quite similar in both countries, and largely independent of individuals' socio-demographic characteristics. Examining the roles of buffering mechanisms, such as social relationships, which might shield individuals from any ill effects of unemployment, within an internationally comparative framework, would be a promising avenue for future work.

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Table 1: Description of the variables contained in the British Household Panel Survey and Russian Longitudinal Monitoring Survey

Variable	United Kingdom – British Household Panel Survey (BHPS)	Russia – Russian Longitudinal Monitoring Survey (RLMS-HSE)
Gender	Gender	Gender
Age	Age	Age
Marital status	Married, cohabiting or civil partnership; never married; separated or divorced; widowed	Married or cohabiting; never married; separated or divorced; widowed
Education level	Higher education; further education, professional education; up to A-Level (equivalent of education up to 18 years); up to GCSE (equivalent of education up to 16 years)	First and higher degrees; Secondary specialized education; complete secondary education; incomplete secondary education
Self-rated health	Please think back over the last 12 months and how your health has been. Compared to people of your own age, would you say that your health on the whole has been...? [Excellent, good, fair, poor, very poor]	Tell me, please, how would you evaluate your health? It is: [Very good; good; average, not good, but not bad; bad; very bad]
Labour market status	Gainfully employed; unemployed; looking after home/family; retired; other (students, long-term sickness or disability, government training scheme, other)	Gainfully employed; unemployed (both looking for work and not looking for work); looking after home/family; retired; other (students, long-term sickness or disability, other)
Assets	Colour television, video recorder, freezer, computer, central heating, at least one car/van	Colour television, video recorder, freezer, computer, central heating, at least one car/van
Perceived economic circumstances	Perception of financial situation [Finding it very difficult; finding it quite difficult; just about getting by; doing all right; living comfortably]	Whether worried about being unable to cover necessary expenses [Very worried; quite worried; both yes and no; not very worried; not worried at all]
Income	Household income over the last year in pounds Sterling (divided by the square root of household size)	Household income over the last 30 days in Russian rubles (divided by the square root of household size)

Table 2: Rates (per 100 person-years) of reporting poor or very poor self-evaluated health over the period 2001–2007 by the explanatory covariates among participants in the British Household Panel Survey, $n=15\ 978$, number of failures = 2809.

Variable	Person-years	%	Failures	Rate	Lower 95% CI	Upper 95% CI
All	72928	100.0%	2809	3.9	3.7	4.0
<i>Gender</i>						
Male	33971	46.6%	1107	3.3	3.1	3.5
Female	38957	53.4%	1702	4.4	4.2	4.6
<i>Age group (2000)</i>						
18–39 years	31802	43.6%	982	3.1	2.9	3.3
40–59 years	25497	35.0%	879	3.4	3.2	3.7
60+ years	15629	21.4%	948	6.1	5.7	6.5
<i>Marital status (2000–2006)</i>						
Married or cohabiting	43770	60.0%	1542	3.5	3.4	3.7
Never married	16536	22.7%	528	3.2	2.9	3.5
Divorced or separated	7398	10.1%	373	5.0	4.6	5.6
Widowed	5224	7.2%	366	7.0	6.3	7.8
<i>Education (2000–2006)</i>						
Higher education	11309	15.5%	222	2.0	1.7	2.2
Further education, professional	5877	8.1%	143	2.4	2.1	2.9
Up to A-Level, until 18 years	13428	18.4%	435	3.2	2.9	3.6
Up to GCSE, until 16 years	42314	58.0%	2009	4.7	4.5	5.0
<i>Self-rated health (2000–2006)</i>						
Excellent	19886	27.3%	243	1.2	1.1	1.4
Good	38121	52.3%	968	2.5	2.4	2.7
Fair	14921	20.5%	1598	10.7	10.2	11.2
<i>Labour market status (2000–2006)</i>						
Gainfully employed	47364	65.0%	1304	2.8	2.6	2.9
Unemployed	1873	2.6%	129	6.9	5.8	8.2
Looking after home/family	5510	7.6%	228	4.1	3.6	4.7
Retired	15367	21.1%	912	5.9	5.6	6.3
Other	2814	3.9%	236	8.4	7.4	9.5
<i>Assets (2000–2006)</i>						
0–2 assets	1159	1.6%	72	6.2	4.9	7.8
3 assets	2559	3.5%	207	8.1	7.1	9.3
4 assets	8157	11.2%	519	6.4	5.8	6.9
5–6 assets	61053	83.7%	2011	3.3	3.2	3.4
<i>Perceived financial situation (2000–2006)</i>						
Finding it very difficult	817	1.1%	92	11.3	9.2	13.8
Finding it quite difficult	2694	3.7%	173	6.4	5.5	7.5
Just about getting by	15749	21.6%	803	5.1	4.8	5.5
Doing all right	28722	39.4%	971	3.4	3.2	3.6
Living comfortably	24946	34.2%	770	3.1	2.9	3.3
<i>Adjusted household income quintiles (2000–2006)</i>						
First	12519	17.2%	726	5.8	5.4	6.2
Second	13474	18.5%	656	4.9	4.5	5.3
Third	14732	20.2%	544	3.7	3.4	4.0
Fourth	15609	21.4%	477	3.1	2.8	3.3
Fifth	16594	22.8%	406	2.4	2.2	2.7

Table 3: Rates (per 100 person-years) of reporting poor or very poor self-evaluated health over the period 2000–2007 by the explanatory covariates among participants in the Russian Longitudinal Monitoring Survey, $n = 10\,739$, number of cases = 1940.

Variable	Person -years	%	Failures	Rate	Lower 95% CI	Upper 95% CI
All	38516	100.0%	1940	5.0	4.8	5.3
<i>Gender</i>						
Male	17238	44.8%	744	4.3	4.0	4.6
Female	21278	55.2%	1196	5.6	5.3	5.9
<i>Age group (2000)</i>						
18–40 years	20653	53.6%	427	2.1	1.9	2.3
40–59 years	13006	33.8%	733	5.6	5.2	6.1
60+ years	4857	12.6%	780	16.1	15.0	17.2
<i>Marital status (2000–2006)</i>						
Married or cohabiting	27937	72.5%	1233	4.4	4.2	4.7
Never married	4151	10.8%	114	2.7	2.3	3.3
Divorced or separated	3274	8.5%	168	5.1	4.4	6.0
Widowed	3154	8.2%	425	13.5	12.3	14.8
<i>Education (2000–2006)</i>						
First and higher degrees	7869	20.4%	297	3.8	3.4	4.2
Secondary specialized education	10412	27.0%	408	3.9	3.6	4.3
Complete secondary education	14535	37.7%	632	4.3	4.0	4.7
Incomplete secondary education	5700	14.8%	603	10.6	9.8	11.5
<i>Self-rated health (2000–2006)</i>						
Very good	615	1.6%	8	1.3	0.7	2.6
Good	12075	31.4%	136	1.1	1.0	1.3
Average, not good but not bad	25826	67.1%	1796	7.0	6.6	7.3
<i>Labour market status (2000–2006)</i>						
Gainfully employed	25326	65.8%	779	3.1	2.9	3.3
Unemployed	4034	10.5%	155	3.8	3.3	4.5
Looking after home/family	2272	5.9%	62	2.7	2.1	3.5
Retired	5862	15.2%	880	15.0	14.1	16.0
Other	1022	2.7%	64	6.3	4.9	8.0
<i>Assets (2000–2006)</i>						
0–2 assets	16999	44.1%	1149	6.8	6.4	7.2
3 assets	10872	28.2%	452	4.2	3.8	4.6
4 assets	7088	18.4%	225	3.2	2.8	3.6
5–6 assets	3557	9.2%	114	3.2	2.7	3.9
<i>Worry not able to cover necessary expenses (2000–2006)</i>						
Very worried	16050	41.7%	901	5.6	5.3	6.0
Quite worried	11702	30.4%	542	4.6	4.3	5.0
Both yes and no	4188	10.9%	186	4.4	3.8	5.1
Not very worried	4643	12.1%	220	4.7	4.2	5.4
Not worried at all	1933	5.0%	91	4.7	3.8	5.8
<i>Adjusted household income quintiles (2000–2006)</i>						
First	6978	18.1	377	5.4	4.9	6.0
Second	7209	18.7	505	7.0	6.4	7.6
Third	7867	20.4	431	5.5	5.0	6.0
Fourth	8226	21.4	361	4.4	4.0	4.9
Fifth	8236	21.4	266	3.2	2.9	3.6

Table 4: Cox model with robust standard errors of estimated rates of declaring poor or very poor health in the UK for 15 978 individuals

Variable	Model 1		Model 2		Model 3	
	Hazard Ratio	95% CI	Hazard Ratio	95% CI	Hazard Ratio	95% CI
<i>Gender</i>						
Male (reference)	-	-	-	-	-	-
Female	1.23***	1.14; 1.33	1.25***	1.15; 1.35	1.25***	1.15; 1.35
Age	1.01***	1.00; 1.01	1.00*	1.00; 1.01	1.00	1.00; 1.01
<i>Marital status</i>						
Married or cohabiting (reference)	-	-	-	-	-	-
Never married	1.09	0.97; 1.21	0.97	0.87; 1.09	0.91	0.81; 1.03
Divorced or separated	1.35***	1.20; 1.51	1.30***	1.16; 1.46	1.20**	1.06; 1.35
Widowed	1.29***	1.13; 1.46	1.25***	1.10; 1.42	1.17*	1.03; 1.34
<i>Education level</i>						
Higher education	0.63***	0.55; 0.73	0.67***	0.58; 0.77	0.69***	0.60; 0.80
Further education, professional	0.70***	0.59; 0.83	0.72***	0.61; 0.86	0.75**	0.63; 0.89
Up to A-Level, until 18 years	0.92	0.83; 1.03	0.94	0.84; 1.04	0.96	0.86; 1.07
Up to GCSE, until 16 years (reference)	-	-	-	-	-	-
<i>Self-rated health</i>						
Excellent	0.13***	0.11; 0.15	0.14***	0.12; 0.16	0.14***	0.12; 0.16
Good	0.25***	0.23; 0.27	0.26***	0.24; 0.28	0.27***	0.25; 0.29
Fair (reference)	-	-	-	-	-	-
<i>Labour market status</i>						
Gainfully employed (reference)			-	-	-	-
Unemployed			1.89***	1.57; 2.27	1.59***	1.32; 1.92
Looking after home/family			1.05	0.90; 1.21	0.99	0.85; 1.15
Retired			1.26***	1.11; 1.43	1.22**	1.07; 1.40
Other			1.84***	1.60; 2.13	1.71***	1.47; 1.98
<i>Assets</i>						
0–2 assets					1.03	0.80; 1.32
3 assets					1.27**	1.08; 1.49
4 assets					1.18**	1.06; 1.31
5–6 assets (reference)					-	-
<i>Perceived financial situation</i>						
Finding it very difficult					2.00***	1.59; 2.52
Finding it quite difficult					1.40***	1.17; 1.66
Just about getting by					1.17**	1.05; 1.30
Doing all right					1.00	0.91; 1.10
Living comfortably (reference)					-	-
Adj. household income (quintiles)					0.99	0.97; 1.03
Akaike Information Criterion	49927		49840		49790	

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 5: Cox model with robust standard errors of estimated rates of declaring poor or very poor health in Russia for 10 739 individuals

Variable	Model 1		Model 2		Model 3	
	Hazard Ratio	95% CI	Hazard Ratio	95% CI	Hazard Ratio	95% CI
<i>Gender</i>						
Male (reference)	-	-	-	-	-	-
Female	1.07	0.97; 1.18	1.06	0.96; 1.16	1.03	0.94; 1.14
Age	1.05***	1.04; 1.05	1.04***	1.04; 1.05	1.04***	1.04; 1.05
<i>Marital status</i>						
Married or cohabiting (reference)	-	-	-	-	-	-
Never married	1.28*	1.04; 1.57	1.09	0.88; 1.35	1.09	0.88; 1.35
Divorced or separated	1.15	0.97; 1.36	1.16	0.98; 1.37	1.13	0.96; 1.34
Widowed	1.06	0.93; 1.21	1.03	0.90; 1.18	1.02	0.90; 1.17
<i>Education level</i>						
First and higher degrees	0.61***	0.52; 0.70	0.67***	0.58; 0.78	0.72***	0.62; 0.84
Secondary specialized education	0.68***	0.59; 0.77	0.72***	0.63; 0.82	0.75***	0.65; 0.86
Complete secondary education	0.88*	0.77; 0.99	0.92	0.81; 1.04	0.93	0.82; 1.06
Incomplete secondary education (reference)	-	-	-	-	-	-
<i>Self-rated health</i>						
Very good	0.34**	0.17; 0.69	0.32**	0.16; 0.63	0.33**	0.16; 0.65
Good	0.27***	0.23; 0.32	0.27***	0.22; 0.32	0.27***	0.23; 0.33
Average (reference)	-	-	-	-	-	-
<i>Labour market status</i>						
Gainfully employed (reference)			-	-	-	-
Unemployed			1.50***	1.26; 1.79	1.42***	1.19; 1.69
Looking after home/family			1.31*	1.01; 1.71	1.31*	1.00; 1.71
Retired			1.45***	1.26; 1.67	1.41***	1.23; 1.63
Other			2.88***	2.20; 3.77	2.87***	2.20; 3.76
<i>Assets</i>						
0–2 assets					1.11	0.89; 1.37
3 assets					1.08	0.87; 1.34
4 assets					0.92	0.73; 1.16
5–6 assets (reference)					-	-
<i>Worry not able to cover necessary expenses</i>						
Very worried					1.20	0.96; 1.50
Quite worried					1.00	0.80; 1.26
Both yes and no					0.96	0.74; 1.24
Not very worried					0.94	0.74; 1.21
Not worried at all (reference)					-	-
Adj. household income (quintiles)					0.99	0.95; 1.03
Akaike Information Criterion	31546		31472		31459	

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$