Impact of financial crisis on selected health outcomes in Europe

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Background: A number of health outcomes were affected by previous financial crises, e.g. suicides, homicides and transport accident mortality. Aim of this study was to analyse the effects of the current financial crisis on selected health outcomes at population level in Europe. Methods: A mixed approach of ecologic and time trend design was applied, including correlation analysis. For eight countries, data on the economic situation (unemployment rate and economic growth) and health indicators (overall mortality, suicide and transport accident mortality) was drawn from EUROSTAT database for 2000–10. Spearman’s rank correlation was applied to analyse the influence of social protection on the association between exposure and outcome variables. Results: The financial crisis had no visible effect on overall mortality in any of the eight countries until 2010. Transport accident mortality decreased in all eight countries, in the range of 18% in Portugal to 52% in Slovenia. In contrast, suicide mortality increased in Germany (+5.3%), Portugal (+5.2%), Czech Republic (+7.6%), Slovakia (+22.7%) and Poland (+19.3%). The effect of unemployment on suicide is higher in countries with lower social spending (Spearman’s r = −0.83). Discussion: Clear cause–effect relations could not be established owing to the ecological study design and issues concerning data availability. However, there are clear changes in suicide and transport accident mortality after onset of the crisis, and findings are consistent with previous work. As part of this work, a comprehensive framework was developed, which can be applied to analyse health effects of financial crises in more detail.

Introduction

Economies around the globe today are interconnected to a great extent: international trade agreements, harmonization of national standards and use of comparative advantages have promoted the international flow of goods and services. Owing to the high degree of interconnection worldwide, changes of conditions for production, supply chains or financial markets in one part of the world can have unpredictable implications for producers, traders and consumers in other regions. An actual example of the impact of this interconnection is the financial crisis that began in 2008 and undoubtedly concerns most countries in the world directly or indirectly. The aim of this article is to provide an analysis of the crisis’ health impact on European level with special attention to the role of the welfare state.

For analysing the health impact of political factors, a typology of welfare regimes is often used as a proxy indicator. Exposure indicators might be the extent of public social expenditure and welfare, redistribution through tax and transfer mechanisms, participation of women in the labour force or the degree of income inequality. Using the size of public spending as indicator is critically discussed, as it may be more influenced by demographic than by political factors, e.g. through a large percentage of elderly people or a small section of people in the working age. Furthermore, it is important to consider how well governments target public spending (e.g. on vulnerable groups) rather than its absolute amount. One finding is that the implementation of redistributive policies is clearly associated with positive health outcomes, e.g. reduced infant mortality. Political parties with redistributive policies were more successful in improving the health of the population than parties without these policies. Falagas et al. provide a definition of financial crises, where the ‘rather unpredictably, relatively smooth financial cycles may be interrupted by periods of economic crisis. The latter may consist of bursting of financial bubbles, bank bankruptcies, sudden deprecation of the stock market or of other financial products, currency crises or inability of national governments to repay their debts’. Derived from that description, one can conclude that the global economy has experienced a major economic crisis in the recent years. Generally, financial or economic crises manifest in a major decline in gross domestic product (GDP), that is, ‘the value of the goods and services produced by a country during a period’ accompanied by an increase in unemployment. Differential policy responses to growing government debt and unemployment are reflected in severe austerity programs, as they are put in place by the troika of International Monetary Fund, European Central Bank and the European Commission. Recently Stuckler and McKee reported on hospitals being closed in Greece, increasing number of people relying on public services, which in return are facing severe budget cuts and thus increasing pressure on the public system. Another possibility of responding to economic downturns is active labour market and social protection policies.

There is a considerable body of literature on the general association of economic fluctuations or previous crises and their impact on health. Summing up, the following associations seem to be well documented:

(i) In crises, all cause mortality was found to increase, whereas road traffic- or transport-related mortality decreased.
(ii) Symptoms for depression and anxiety increase with unemployment at the individual level, as well as an increase in smoking, alcohol consumption and drug use.
(iii) During economic crises, suicide and homicide rates increased in a number of countries.
Another aspect often discussed is the role of the social welfare state in mitigating adverse effects. Extensive social and health policies can protect people who become unemployed from absolute deprivation and maintain access to health care, but this needs proper and sustained funding. A study among OECD countries found that effects are particularly harmful in countries with weak social insurance systems, for which social expenditure as share of GDP is used as a proxy indicator. For example, in Sweden, a lower impact of macroeconomic fluctuations on health was found compared with the USA, which could be explained by the Swedish welfare system with labour regulations, employee-friendly labour market and a tight social security net. Other studies observed a more diverse picture. Whereas suicide mortality declined between 2007 and 2009 despite an increase in unemployment in Austria, it increased over 5% in Finland, and both countries have relatively strong social safety nets.

The objective of the present study was to develop a framework to describe the impact of economic crises on health, assess whether there is a visible impact on population health and estimate the role of the welfare state and redistribution policies on mitigation of potential impacts.

Methods

Study design

In this study, a mixed design approach was applied to compare health outcomes both over time (observation period 2000–10) and between different groups. The level of analysis here are the single European Union (EU) countries. This approach includes ecologic and time-trend design. Ecologic studies are suitable here because units of analysis are single EU countries for which the wider political and economic context and health outcomes on population level are analysed. The time trend design is an exploratory approach that tries to compare disease rates over time in one geographically defined population. The initial and central step is the graphical display of time trends (results not shown here).

Data collection

All data were extracted from EUROSTAT database. As indicators of the economic situation in a country, GDP and unemployment are selected as exposure variables in this study. Outcome variables include overall mortality (all causes of death), suicide mortality (ICD-codes E950-E959 and X60-X84) and transport accident mortality, covering all transport modes (i.e. train, road vehicles, sea, air and inland waterways), whereas the vast majority of deaths account to road accidents. These rates are age standardized according to the European standard population. The variables suicide and transport accident mortality have been selected based on the literature, as they are known to react sensitively to macroeconomic fluctuations and thus can show health effects already within a short timeframe after onset of the crisis. For example, road traffic may change together with economic activity, which mediates the effect on road traffic mortality. Unemployment may affect health via psychosocial pathways, resulting in increased suicide rates.

Data for these health outcomes are available until the year 2010 for most of the EU countries, whereas economic indicators are provided more rapidly with predictions for the near future. Starting point was the year 2000 to show the trend in economic and health indicators before the crisis and to be able to calculate correlations between these variables in each country.

As potentially mitigating the adverse health effects of the financial crisis, several authors identified the extent of the welfare state. Therefore, public social spending, measured as percent of the GDP, was also included in further analyses. Most recent data on social spending was available for 2009, and for analysis purposes, country averages were calculated for the period of 2000–9.

Data analysis

The selection of countries was done as follows:

(i) First, all 27 EU countries were ranked according to their share of social spending as % of GDP. Three groups were created based on the distribution of values (10 countries with high public social spending >25% of GDP, 7 countries with medium public social spending 19–25% of GDP and 10 countries with <19% of GDP).

(ii) In high-spending group, there were only two countries that provided most recent mortality data until 2010, and so, both were selected.

(iii) From the other categories, three countries were selected randomly for analysis, to have a comparable number in each group.

Finally, there were eight countries for further analysis: Bulgaria, Czech Republic, Finland, Germany, Poland, Portugal, Slovakia and Slovenia.

The strength of the association between economic and health indicators in each country was assessed via correlation analysis. In another step, cross correlation was conducted, to investigate whether a change in one variable is significantly linked to a change in another variable immediately (lag 0) or with a time lag of ≥1 years. A positive lag indicates that mortality in x years is associated to the current level of unemployment or GDP growth. A negative lag indicates that unemployment rate or GDP growth in a year is associated to a certain mortality rate x years before. Rank correlation was applied to assess whether the extent of social spending has an influence on the association between exposure and outcome variables.

Results

Based on existing literature, an analytic framework was developed that describes major exposures for health effects of the financial crises (Figure 1). Multiple outcomes such as overall mortality, transport or road traffic accidents and mortality, cardiovascular risks and diseases, infectious diseases, mental health and others have been described and analysed before. Factors that supposedly mediate the health effect of economic downturn and unemployment are public financing, changes in the health care system, environmental factors as well as individual behavioural and psychological factors. In addition, political factors have been included in the model as potentially mitigating factors for health outcomes of financial crises. Social policies, labour market programs and the quality of the social insurance system depend on political decisions and actions that can exhibit their influence on different levels. For example, labour market programs, such as short-time work, that are implemented early in a recession might avoid high levels of unemployment. An insurance scheme with universal access independent of a person’s income or employment status can maintain access to quality care during financial crises. Prioritization of social and health sectors by the government can prevent from immense budget cuts in these sectors, which can keep up prevention and disease control efforts and assure quality treatment in case of disease.
Economic development

All of the eight countries experienced negative economic growth in 2009, ranging from −2.9% in Portugal to −8.4% in Finland compared with the previous year. The only exception was Poland, where growth was still positive (+1.6%) even though it was lower than in previous years. Average GDP growth in the eight selected countries was −4.7% in 2009, less severe than the average of all EU countries with −5.8%. In 2010, there was again positive growth in all countries but relatively low compared with pre-2008 levels (between +0.4% in Bulgaria and +4.2% in Slovakia).

Before 2008, unemployment was declining or stagnating in all eight countries. In 2009, there was a clear increase in all countries between +3.8% (Germany) and +34.1% (Slovenia and Czech Republic) and in 2010 a further increase between +2.4% (Finland) and +50% (Bulgaria). The only exception is Germany, where the unemployment rate fell again by about −10%.

Overall mortality rates declined continuously in all countries and did not show deviations from their long-term trend during the whole decade.

Development of suicide rates was heterogeneous among EU countries. In Germany, Portugal and Czech Republic between 2007 and 2010, suicide rates increased by 3.3%, 5.2 and 7.6%, respectively. In Slovakia and Poland, increases were exceptionally high with 22.7 and 19.3%, respectively, between 2007 and 2010. Rates declined in Finland (−4.6%), Slovenia (−6.5%) and Bulgaria (−2.1%).

There was a strong decline in transport accident mortality in all eight countries included in this analysis. For Bulgaria, Poland, Slovakia and Slovenia, deviations from previous trend were clearly visible. Minimum change was −18% in Portugal and the maximum −52% in Slovenia between 2007 and 2010.

Table 1 shows the associations between economic and health indicators for the studied countries. Generally, unemployment is significantly associated to any kind of mortality in more countries (six of eight) than is a change in economic growth (two of eight).

Correlation analysis

The rank correlation between the correlation coefficient of suicide mortality and unemployment on the one side and social spending on the other is \( r = -0.83 \), with \( P = 0.01 \). This means that a higher correlation coefficient between unemployment rate and suicide mortality goes together with a lower social spending. In other words, when social spending is low in a country, unemployment rate has a stronger effect on suicide mortality (Table 2).

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**Table 1** Strength of relationship between selected exposure and outcome variables in eight European countries, correlation coefficients \( \rho \)

<table>
<thead>
<tr>
<th>Country</th>
<th>SDR total ( (P) )</th>
<th>SDR transport accidents ( (P) )</th>
<th>SDR suicide ( (P) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>0.23(0.49)</td>
<td>0.18(0.60)</td>
<td>0.14(0.69)</td>
</tr>
<tr>
<td>Finland</td>
<td>0.00(0.99)</td>
<td>0.09(0.80)</td>
<td>0.01(0.99)</td>
</tr>
<tr>
<td>Portugal</td>
<td>0.84(0.00)</td>
<td>0.89(0.00)</td>
<td>0.17(0.62)</td>
</tr>
<tr>
<td>Slovenia</td>
<td>0.37(0.25)</td>
<td>0.11(0.73)</td>
<td>−0.49(0.13)</td>
</tr>
<tr>
<td>Spain</td>
<td>0.35(0.29)</td>
<td>0.63(0.04)</td>
<td>0.27(0.42)</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>0.67(0.02)</td>
<td>0.44(0.17)</td>
<td>0.81(0.00)</td>
</tr>
<tr>
<td>Slovakia</td>
<td>0.29(0.38)</td>
<td>0.26(0.42)</td>
<td>0.12(0.73)</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>0.81(0.00)</td>
<td>−0.06(0.87)</td>
<td>0.92(0.00)</td>
</tr>
</tbody>
</table>

**Table 2** Rank correlation coefficients \( r_s \) of the association between social spending and the correlation between the different exposure and outcome variables

<table>
<thead>
<tr>
<th>Social spending</th>
<th>( r_s )</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP vs. total mortality</td>
<td>−0.21</td>
<td>0.61</td>
</tr>
<tr>
<td>GDP vs. transport mortality</td>
<td>−0.43</td>
<td>0.29</td>
</tr>
<tr>
<td>GDP vs. suicide mortality</td>
<td>−0.19</td>
<td>0.65</td>
</tr>
<tr>
<td>Unemployment vs. total mortality</td>
<td>−0.48</td>
<td>0.23</td>
</tr>
<tr>
<td>Unemployment vs. transport mortality</td>
<td>0.24</td>
<td>0.57</td>
</tr>
<tr>
<td>Unemployment vs. suicide mortality</td>
<td>−0.83</td>
<td>0.01</td>
</tr>
</tbody>
</table>
Discussion

The years 2008 and 2009 are clearly marked as the onset of the financial crisis when looking at the development of GDP and unemployment compared with previous years. The analysis shows that there is no effect on the overall mortality rates through the crisis, as rates continue to decline. The analysis of a correlation between change in GDP and overall mortality fits to this observation, as there is no significant association between the variables in any of the eight countries. In contrast to that, unemployment is strongly correlated to overall mortality in six countries; both variables show a general declining trend over the study period. Effects of the crisis on overall mortality might rather be visible in the medium and long term through changes in behaviour and other risk factors (especially for cardiovascular and mental problems), when economic development remains low and especially unemployment increases further or remains high, respectively. Authors have described contradicting effects of recessions or economic crisis on cardiovascular disease risk; some state it might reduce, due to a more salutary behaviour and less atmospheric pollution, whereas other authors predict an increase in risk through negative behaviour change. EUROSTAT’s prediction of GDP growth shows ongoing low or declining rates for all EU countries. This means that health effects need to be assessed again at a later point in time to make more valid statements about the crisis’ impact on population health. Absence of effect on overall mortality could be explained by implementation of government approaches in response to the crisis, e.g., health promotion strategies, tax increases on alcohol and cigarettes to encourage healthy living and overlapping of positive and negative developments in cause-specific mortality rates. This becomes clear when looking at the development of suicide (increasing after crisis onset) and transport accident mortality (decreasing), which might level each other out. Other cause-specific mortality rates, which have not been analysed in this study, might also show opposing trends.

The development of suicide mortality is more heterogeneous among the eight countries in the analysis. The hypothesis that suicide increases in times of financial crisis could be confirmed for four of the countries in this analysis. This result is consistent with findings by Catalano, who described increased anxiety and depression in unemployed persons. Stuckler et al. also predicted an increase of suicide mortality and a decrease in transport accidents when unemployment increases. An increase in suicide might be explained by increased levels of stress due to financial insecurity and job loss. Furthermore, fear is transmitted through media coverage about the crisis, which might exhibit a psychological effect also on people who are not directly affected by job loss and financial insecurity. Suhre and Stuckler also relate an increase in suicide and CVD risk to the adverse mental health effect of crises. One country showed a strong negative correlation of GDP and suicide mortality, indicating that a declining economy is associated with an increase in suicide rates. In four countries, unemployment was significantly positively correlated with suicide mortality. In a further analysis, this last association could be shown to be stronger in countries with lower social protection. This means in turn that high social protection policies (social spending, unemployment benefits etc.) can contribute to mitigate the adverse effects of negative economic development on suicides. This association was also shown and described by other authors. Stuckler and colleagues found that each $100 more social spending per capita reduced the effect of unemployment on suicide. The hypothesis concerning the protective effect of social protection could thus be confirmed, though not for all variables.

Transport accident mortality clearly decreased during the crisis in all of the eight countries, but only in four of them a clear deviation from a precrisis trend can be observed: Slovenia, Poland, Slovakia and Bulgaria. This development is ongoing from 2008 to 2010 and stronger than suicide mortality. Such effect was described before by other authors as well. A reduced transport accident mortality can be explained, e.g., by a reduced car use for occupational or recreational purpose on individual level due to lower financial resources. Reduced economic interactions and less trade activity might be named as the reason on macroeconomic level due to currency depreciation, bankruptcies and other factors. These effects can be seen immediately after the onset of financial crises in comparison with other health effects that need some time to develop, like mental problems or cardiovascular diseases. Even though transport accident mortality is strongly declining after the onset of the financial crisis, the number of significant correlations of transport accident mortality with GDP or unemployment is lower than for overall and suicide mortality. Another reason for declining mortality from transport accidents is the use of safer cars and improved road security, which contribute to a reduced number of accidents. Better medical treatment might contribute as well, so that even when accidents occur, chances of survival are bigger. This might explain why most countries had declining mortality rates already in previous years. There seems to be no influence of social protection on the change in transport accident mortality.

Limitations of the study

The range of analysed indicators was limited and could be expanded in future. For example, inclusion of infant mortality as health outcome would be one option. More detailed data on ‘exposure side’ (GDP, unemployment) would also improve accuracy of estimates. Five of the selected eight countries are from new member states of EU compared with three from members before 2004. In terms of range of GDP and its fluctuation, this might increase the validity of study and the proposed conceptual framework as it enlarges the range of GDP considered. This choice, however, creates certain uncertainty, as the new member states were at the time of analysis still under transition period. This can affect both exposure and health data. Naturally, owing to limited time and resources for the study, routinely collected information was used with no possibility to verify values. Moreover, the design does not allow for control of potential confounders or effect modifiers. The aim of the work was to develop a conceptual framework, which in future could be verified in prospective studies and control for potential confounding variables. Verification of the framework could be done also by application of multivariate analysis in future.

Conclusions

The described model and statistical analysis are indicative of the role of social policies in time of economic crisis. Through importance of social policies as kind of mediator, this article highlights the importance of further increasing efforts to ensure that health is an important indicator on all policy sectors as was recently affirmed in the Helsinki statement of health in all policies.

Funding

There was no specific funding provided for this work. All was done as part of standard University duties.

Conflicts of interest: None declared.
Key points

- This work includes a development of a conceptual analytical framework, which can be applied to analyse effects of financial crisis in more detail.
- We found no change in overall mortality as trend continued to decline after crisis onset in 2008.
- Decline in transport accident mortality might be attributed to less economic activity.
- Mental health especially affected, as increase in suicide mortality shows.
- Prioritization of social policies can mitigate adverse association between economic and health indicators.

References