

Have health trends worsened in Greece as a result of the financial crisis? A quasi-experimental approach

Sotiris Vitoros¹, Philipp Hessel¹, Tiziana Leone¹, Mauricio Avendano^{1,2,3}

¹ LSE Health, London School of Economics and Political Science, London, UK

² Department of Social and Behavioral Studies, Harvard School of Public Health, Boston, MA, USA

³ Department of Public Health, Erasmus Medical Center, Rotterdam, The Netherlands

Correspondence: Sotiris Vitoros, LSE Health, Cowdray House, London School of Economics and Political Science, Houghton Street, London WC2A 2AE, UK, tel: + 44 207 107 5306, fax: + 44 207 955 6803, e-mail: s.vitoros@lse.ac.uk

Background: Health in Greece deteriorated after the recent financial crisis, but whether this decline was caused by the recent financial crisis has not been established. This article uses a quasi-experimental approach to examine the impact of the recent financial crisis on health in Greece. **Methods:** Data came from the European Union Statistics on Income and Living Conditions survey for the years 2006–09. We applied a difference-in-differences approach that compares health trends before and after the financial crisis in Greece with trends in a control population (Poland) that did not experience a recession and had health trends comparable with Greece before the crisis. We used logistic regression to model the impact of the financial crisis on poor self-rated health, controlling for demographic confounders. **Results:** Results provide strong evidence of a statistically significant negative effect of the financial crisis on health trends. Relative to the control population, Greece experienced a significantly larger increase in the odds of reporting poor health after the crisis (odds ratio, 1.16; 95% confidence interval, 1.04–1.29). There was no difference in health trends between Poland and Greece before the financial crisis, supporting a causal interpretation of health declines in Greece as a result of the financial crisis. **Conclusion:** Results provide evidence that trends in self-rated health in Greece worsened as a result of the recent financial crisis. Findings stress the need for urgent health policy responses to the recent economic collapse in Greece as the full impact of austerity measures unfolds in the coming years.

Introduction

The effect of economic recessions on health has attracted recent attention as a response to the recent financial crisis. Previous studies suggest that conditions that intensify during recessions such as unemployment, involuntary job-loss and job insecurity have a negative impact on health.^{1–7} Although evidence is inconsistent,^{8,9} other studies suggest that mortality decreases and physical health improves during economic recessions.^{10–15} Evidence on the impact of the 2009 recession in Europe is yet to come, but a recent study suggests that there has been an increase in suicides and a decrease in road accident deaths in Europe.¹⁶

Most European countries were in recession for <12 months, while Greece has faced a prolonged crisis with unemployment rising steeply in 2010 and 2011,¹⁷ showing poor prospects of immediate recovery. In a recent study, Kentikelenis *et al.*¹⁸ examined the health impact of the recent financial crisis in Greece and concluded that between 2007 and 2009, there was an increase in rates of poor self-rated health and unmet care. Their analysis provides an interesting and useful first glance at the impact of the economic crisis on health in Greece. However, their analysis relies on a single comparison of rates of health problems between 2007 and 2009 in Greece without a control group comparison, making it impossible to distinguish autonomous health trends from true declines in health causally attributable to the financial crises. In addition, their findings partly contradict evidence from some studies that overall mortality tends to decrease and physical health tends to improve during economic recessions.^{10–15}

In this article, we applied a difference-in-differences (DID) approach, a quasi-experimental technique that explicitly introduces a control group to advance the study of Kentikelenis *et al.* This estimation technique compares outcomes in the ‘treatment group’ before and after the financial crisis with pre- and post-treatment outcomes in a predefined control group.¹⁹ This is preferred to

examining health trends in the treatment group only, an approach potentially confounded by secular trends unrelated to the financial crisis. Assuming common trends in health before the crisis between the treatment and control groups, the DID estimator uses the control group to subtract out trend effects, to isolate the impact of the financial crisis on health trends.

Methods

We reanalysed data from the European Union Statistics on Income and Living Conditions (EU-SILC) for the years 2006, 2007, 2008 and 2009 for Greece²⁰ using a DID methodology. This approach is based on a comparison of trends in health between Greece and a pre-determined control population that was not exposed to the financial crisis in the same period, but that can otherwise be assumed to have comparable underlying health trends to Greece. The control population needs not be identical to Greece. However, the DID approach assumes that health trends (rather than levels) in the control population would have been equal to those in Greece in the absence of the crisis. This is known as the common trend assumption. We identified Poland as an appropriate control group for two reasons. First, Poland was the only EU country that experienced positive economic growth rates throughout the study period.²¹ Second, analysis of the EU-SILC data confirmed the common trend assumption between Poland and Greece in the years before the crisis. To test the validity of the common trend assumption, we estimated trends in self-rated health in Poland and Greece before the financial crisis. If the DID approach is valid, there should be no difference in trends between the two countries in the period 2006–08.

The data for the analysis come from the EU-SILC.²² The main purpose of EU-SILC is to provide nationally representative, comparable, cross-sectional as well as longitudinal data on income, poverty, social exclusion and living conditions of the

population residing in private households and aged ≥ 16 years. Most countries have adopted a two-stage stratified probability sampling for the data collection, whereas Greece uses a sampling of households, and Poland uses a sampling of dwellings/addresses. For this study, we used repeated cross-sectional data for Poland and Greece for the years 2006–09. The average household response rate in 2008 was about 90% in Greece and 85% in Poland.²³

Our analysis focuses on self-rated health because it is plausibly more sensitive to short-term shocks than other health outcomes such as chronic conditions and disability. Self-rated health was measured by asking respondents to rate their health on a 5-point scale. We distinguished between individuals who claimed that their health was 'bad' or 'very bad' vs. those who claimed that their health was 'fair', 'good' or 'very good'. Using logistic regression, we compared the odds of poor health after the beginning of the financial crisis (2009) with the odds of poor health before the financial crisis in Greece and subtracted this difference from the equivalent change in health before and after the crisis in Poland (the control population). The key outcome of the study is self-rated health. The effect of interest is captured by the interaction between the financial crisis year (2009) and country, namely the DID estimate. We controlled for a set of potential confounders including age, sex, marital status, degree of urbanisation and educational level, in the same manner as in the study by Kentikelenis *et al.*¹⁸ These confounders were chosen because they were potentially associated with health and differed between the two countries. Marital status and degree of urbanization may not only be confounders but also mediators, as they may themselves be influenced by the economic downturn. However, results remained unchanged in models that excluded these variables. We therefore present only results from models that controlled for all potential confounders.

To assess the robustness of our findings, we also compared health in 2009 with health in the year 2006, to exclude any possible early effects of the crisis in late 2008. Analyses were conducted in Stata/SE 11.2 with and without appropriate sampling weights.

Results

Summary statistics of the two samples are presented in table 1. Compared with their Polish counterparts, Greeks had on average

better health, were older, were more likely to live in intermediate urbanized areas and had lower educational levels. These differences emphasize the need for a DID approach that controls for differences in levels, focusing only on comparing trends in self-rated health between the two countries.

To test the validity of the common trend assumption, we first estimated trends in self-rated health in Poland and Greece before the financial crisis, based on DID estimates for the pre-crisis years (table 2). DID estimates examine differential trends in the two countries before the crisis, expressed as the interaction between country and year. If the DID approach is valid, there should be no difference in trends between the two countries in the period 2006–08. Odds ratios (ORs) for the year dummy, which corresponds to the estimate of trends in self-rated health in Poland (the reference population), suggest that the odds of poor self-rated health significantly declined over time in this period. For example, the odds of poor self-rated health declined by 7% [OR, 0.93; 95% confidence interval (CI), 0.89–0.97] in Poland between 2006–07 and 2008. Trends in self-rated health in Greece were not significantly different from those in Poland, suggesting a similar decline in the odds of poor self-rated health in both countries before the financial crisis. This is illustrated by the interaction between country and year (the DID estimate), and for several sets of comparisons including 2006–07 vs. 2008 (OR, 1.03; 95% CI, 0.95–1.13), 2006 vs. 2007 (OR, 0.98; 95% CI, 0.89–1.09) and 2007 vs. 2008 (OR, 1.04; 95% CI, 0.94–1.15). These findings confirm the common trend assumption and suggest that in the years leading to the financial crisis, both countries were experiencing a decline in the odds of poor self-rated health.

Table 3 presents DID estimates examining differential trends between the two countries for the full period 2006–09, expressed as the interaction between country and financial crisis year. Results provide evidence of a statistically significant negative effect of the financial crisis on self-rated health trends in Greece. While Poland continued to experience declines in the odds of self-rated health after the financial crisis, Greece experienced significantly less favourable trends than Poland. For example, while the odds of poor self-rated health declined by 10% (OR, 0.91; 95% CI, 0.86–0.95) after the financial crisis in Poland, there was a significant positive interaction between trend and country (OR, 1.16; 95% CI,

Table 1 Summary statistics of EU-SILC data from Greece and Poland pooled for the period 2006–09

	Greece		Poland		t-test	P-value
	n	%	n	%		
N	54 120	100	136 952	100		
Bad or very bad self-rated health	5715	10.56	23 133	18.00	−39.970	0.000
Age					39.931	0.000
17–25	6296	11.63	23 977	17.51	−31.767	0.000
26–35	8393	15.51	21 791	15.91	−2.178	0.029
36–45	9168	16.94	20 612	15.05	10.263	0.000
46–55	8591	15.87	26 505	19.35	−17.712	0.000
56–65	7232	13.36	18 921	13.82	−2.595	0.010
Over 65	14 440	26.68	25 146	18.36	40.608	0.000
Male	25 975	48.00	64 858	47.36	2.512	0.012
Married	33 868	62.58	77 918	60.62	7.862	0.000
Urbanisation (1 highest, 3 lowest)	54 120		136 952		−2.232	0.026
Densely populated area	19 780	36.55	47 043	34.35	9.081	0.000
Intermediate area	6227	11.51	20 361	14.87	−19.146	0.000
Thinly populated area	28 113	51.95	69 548	50.78	4.582	0.000
Education (level: 1 lowest, 5 highest)	52 268		128 218		−44.931	0.000
Pre-primary education	1939	3.71	2754	2.15	20.022	0.000
Primary education	17 511	33.50	24 529	19.13	69.541	0.000
Lower secondary education	6467	12.37	7392	5.77	50.077	0.000
Upper secondary education	15 255	29.19	72 428	56.49	−100.000	0.000
Post-secondary non-tertiary education	2087	3.99	4935	3.85	2.646	0.008
Tertiary education	9009	17.24	16 180	12.62	28.189	0.000

Table 2 Test of the common trend assumption: DID logit regression-based ORs before the financial crisis (2006–08)

	OR and 95% CI (weighted)			OR and 95% CI (unweighted)		
	2006–07 vs. 2008	2006 vs. 2007	2007 vs. 2008	2006–07 vs. 2008	2006 vs. 2007	2007 vs. 2008
DID estimate (country × year dummy)	1.032 (0.945–1.127)	0.984 (0.887–1.092)	1.039 (0.938–1.152)	1.055 (0.943–1.180)	0.963 (0.847–1.095)	1.075 (0.944–1.224)
Country (Greece)	0.283* (0.268–0.299)	0.287* (0.266–0.309)	0.280* (0.260–0.302)	0.285* (0.267–0.304)	0.291* (0.265–0.319)	0.279* (0.254–0.307)
Year dummy	0.932* (0.895–0.970)	0.950** (0.908–0.994)	0.956*** (0.913–1.002)	0.935* (0.892–0.980)	0.950*** (0.902–1.001)	0.959 (0.908–1.013)
Age ^a	1.081* (1.079–1.083)	1.081* (1.079–1.084)	1.080* (1.077–1.082)	1.080* (1.077–1.082)	1.080* (1.077–1.083)	1.080* (1.077–1.083)
Age ≥65 ^a	0.675* (0.638–0.714)	0.663* (0.619–0.710)	0.695* (0.648–0.745)	0.669* (0.626–0.714)	0.661* (0.611–0.715)	0.683* (0.629–0.742)
Male	1.017 (0.982–1.053)	1.002 (0.961–1.045)	1.022 (0.979–1.067)	1.056* (1.014–1.101)	1.035 (0.985–1.088)	1.065** (1.011–1.122)
Married	0.743* (0.717–0.771)	0.752* (0.719–0.787)	0.730* (0.698–0.764)	0.716* (0.685–0.749)	0.726* (0.688–0.765)	0.704* (0.666–0.745)
Degree of urbanisation	0.976** (0.957–0.995)	0.982 (0.959–1.005)	0.967* (0.944–0.990)	0.985 (0.963–1.007)	0.99 (0.964–1.017)	0.982 (0.955–1.010)
Education level	0.761* (0.750–0.773)	0.765* (0.751–0.779)	0.759* (0.746–0.773)	0.751* (0.738–0.764)	0.754* (0.738–0.769)	0.751* (0.736–0.768)
Observations	136 720	91 550	89 780	136 720	91 550	89 780

^aAge indicates the effect of an additional year of age; age ≥65 indicates whether the respondent is 65 years old or older and accounts for differential age effects before and after age 65.

P*<0.01, *P*<0.05, ****P*<0.1.

Table 3 Difference-in-difference logit regression-based ORs: change in self-rated health after the financial crisis in Greece relative to Poland (control population)

	OR and 95% CI (weighted)		OR and 95% CI (unweighted)	
	2006-08 vs. 2009	2006 vs. 2009	2006-08 vs. 2009	2006 vs. 2009
DID Estimate (country × financial crisis dummy)	1.157* (1.042–1.286)	1.156** (1.018–1.314)	1.097** (1.012–1.190)	1.098*** (0.993–1.214)
Country (Greece)	0.290* (0.275–0.306)	0.291* (0.265–0.319)	0.283* (0.271–0.296)	0.282* (0.262–0.304)
Financial crisis dummy	0.906* (0.865–0.950)	0.865* (0.818–0.913)	0.908* (0.874–0.945)	0.866* (0.826–0.907)
Age ^a	1.079* (1.077–1.081)	1.079* (1.076–1.082)	1.080* (1.078–1.082)	1.081* (1.078–1.083)
Age ≥65 ^a	0.681* (0.643–0.722)	0.677* (0.624–0.735)	0.691* (0.658–0.726)	0.684* (0.638–0.734)
Male	1.054* (1.016–1.094)	1.044 (0.992–1.099)	1.021 (0.991–1.052)	1.02 (0.978–1.064)
Married	0.710* (0.682–0.738)	0.715* (0.676–0.756)	0.738* (0.715–0.763)	0.747* (0.713–0.781)
Degree of urbanisation	0.985 (0.965–1.005)	0.988 (0.961–1.016)	0.980** (0.964–0.997)	0.994 (0.971–1.018)
Education level	0.751* (0.739–0.762)	0.751* (0.735–0.767)	0.757* (0.747–0.766)	0.755* (0.742–0.769)
Observations	180 486	90 706	180 486	90 706

^aAge indicates the effect of an additional year of age; age ≥65 indicates whether the respondent is 65 years old or older and accounts for differential age effects before and after age 65.

P*<0.01, *P*<0.05, ****P*<0.1.

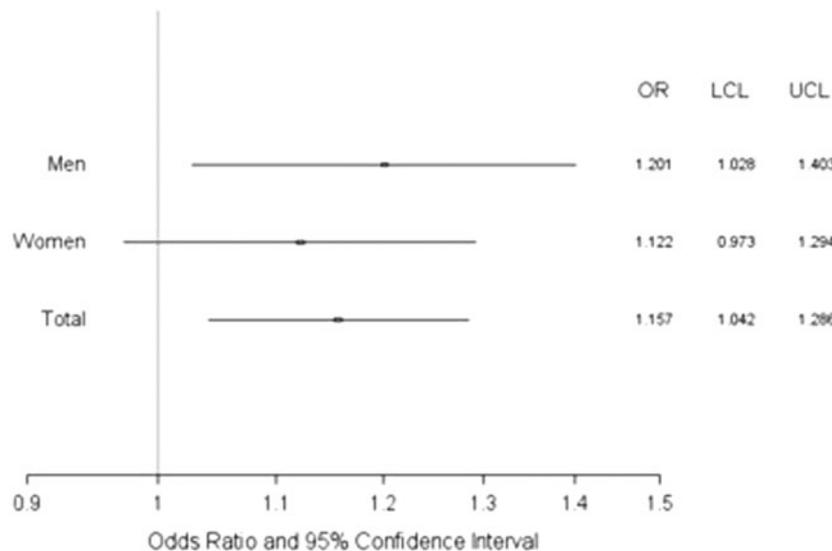


Figure 1 Difference-in-difference logit regression-based ORs: trends in poor self-rated health after the financial crisis in Greece relative to Poland separately for men and women, 2006-2008 vs. 2009. *Note:* ORs are from a logistic regression that controls for age, sex, marital status, degree of urbanisation and educational level. Data are from the EU-SILC, 2006, 2007, 2008 and 2009 waves. Sample included people aged ≥17 years. Lines correspond to the 95% CI. Detailed results are presented in [Supplementary Tables SA1 and SA2](#)

1.04–1.29), indicating less favourable health trends in Greece as compared with Poland after the financial collapse. Similar DID estimates were observed when comparing 2006 and 2009 (OR, 1.16; 95% CI, 1.02–1.31).

Figure 1 shows DID estimates separately for men and women. Although DID estimates were not statistically different between men and women, the crisis had a particularly negative effect on the health of men (OR, 1.20; 95% CI, 1.03–1.40). Among women, there was also an indication of less favourable health trends in Greece than in Poland, but effects were smaller and did not reach conventional statistical significance levels (OR, 1.12; 95% CI, 0.97–1.29).

In sensitivity analyses, results from models that did not incorporate sampling weights differed slightly but showed overall a similar pattern as estimates from weighted models (Supplementary tables SA1 and SA2). In addition, for robustness, we estimated models including interactions of country and gender with all demographic variables (Supplementary table SA3). Results on the detrimental impact of the financial crisis on health trends in Greece were consistent with those of the baseline model.

Discussion

Prior studies have found that economic recessions are associated with improved physical health and lower overall mortality, but higher suicide rates.^{10–14} Based on a DID approach, we found empirical evidence that the recent financial crisis had a negative impact on self-rated health trends in Greece. These results support earlier findings suggesting that health has deteriorated in Greece during recent years,^{18,24} but further strengthen the conclusion that unfavourable health trends appear to be indeed attributable to the financial crisis, and not only to autonomous health trends.

Two overall explanations can be provided for our results. Our results may be driven by changes in physical health. The financial crisis may have led to reduced access to care, in turn leading to physical health deterioration. The economic crisis may have also increased the prevalence of risk behaviours such as excessive alcohol use, potentially leading to worse physical health.²⁵ In addition, the recession may have increased stress, which could have directly influenced health outcomes. An alternative explanation, however, is that declines in self-rated health primarily reflect changes in mental health as a result of the crisis. Self-rated health is a generic measure incorporating elements of both physical and mental health, and the latter may be more responsive to economic shocks in the short-term. This is consistent with findings from recent studies that suggest that from all causes of death influenced by economic cycles, suicide appears to be the only cause that consistently increases during economic recessions.^{15,16} Our results may thus reflect the strong impact of the financial crisis on mental health, rather than the direct effect of the crisis on access to care, behaviour or other determinants of physical health.

Recent studies confirm the dominance of negative mental health effects in response to the recent economic downturn. Particularly among men, the recent economic downturn in Europe and the USA has led to a significant increase in suicide rates^{26,27} and a worsening of mental health outcomes.^{28,29} Part of the effect of the recent recession might reflect the direct effect of individual unemployment on mental health. Unemployment may not only lead to a substantial loss in earnings,³⁰ but it may also influence mental health via several non-financial pathways such as chronic stress, reduced social interaction, decreased self-esteem and social recognition³¹ and increased prevalence of smoking, drinking and physical inactivity.³² Notably, however, evidence from the recent economic downturn suggests that worsening mental health may not only be attributable to increased unemployment, as mental health appears to worsen also

among those in employment.²⁸ The recession may thus also influence mental health through other mechanisms such as job insecurity and general anxiety associated with economic instability.^{33,34}

Interestingly, some studies suggest that, in the UK, the recent economic downturn led to worse mental health outcomes among men only.²⁸ Previous studies have also found stronger effects of economic downturns on suicide among men, while effects for women are generally weaker.²⁶ In stratified models, we found that effects of the financial crisis in Greece were indeed stronger and significant among men, while weaker and non-significant effects were observed among females. A possible explanation is that unemployment and job insecurity have had larger effects on men's mental health,²⁸ particularly in Greece, where males still have higher labour force participation than females.³⁵ However, DID estimates were not statistically different, and CIs overlapped between men and women. Further research is required to examine to what extent men and women responded differently to the recent economic downturn in Greece.

This article is not without limitations. Some important variables could not be included in our analysis owing to lack of available data. For example, behavioural risk factors or early life conditions could have influenced self-reported health outcomes. In addition, there is the possibility of differential response bias or attrition between countries. Although we cannot rule out that this may account for some of our findings, household response rates were relatively high and similar between the two countries (90% for Greece, 85% for Poland).

In conclusion, using a DID approach, we found empirical evidence that the financial crisis had a negative impact on trends in self-rated health in Greece. After 2009, Greece experienced even higher unemployment rates (from 8.9 in 2006 to 19.2% in 2011) and the economy shrank at a rate of 6.8% in 2011.³⁵ This suggests that the full impact of the crisis on health might be yet to come as austerity measures unfold in the coming years. Findings may apply to other countries in similar financial circumstances and stress the need for urgent health policy responses to the recent economic collapse in Greece and the European region.

Supplementary Data

Supplementary data are available at *EURPUB* online.

Acknowledgements

We are grateful to the Editor of the Journal and two anonymous referees for useful comments and suggestions and helpful criticism.

This article uses data from EU-SILC (European Union Statistics on Income and Living Conditions) 1 August 2011 release, Eurostat: Luxemburg, <http://circa.europa.eu/Public/irc/dsis/eusilc/library>

Funding

Part of this article is based on research undertaken for a project funded by the European Commission, DG Employment, Social Affairs and Equal Opportunities, on health status and living conditions in the EU (Contract No. VC/2008/932). This work is supported by a grant from the European Research Council (grant no. 263684 to M.A. and P.H.). All the views expressed are the authors' own.

Conflicts of interest: None declared.

Key points

- Previous findings on the effects of financial crisis on health are inconclusive. According to some studies, conditions that intensify during recessions have a negative impact on health, while others suggest that mortality decreases and physical health improves during economic recessions.
- Evidence from the recent economic crisis in the EU is limited, while previous studies are hampered by the lack of a control group or individual panel data.
- This study contributes to the literature by providing an innovative methodological approach (DID estimation) to study the impact of the recession on health in Greece.
- We find strong empirical evidence that the financial crisis has had a negative impact on trends in self-rated health in Greece.
- Findings stress the need for urgent health policy responses to the recent economic collapse in Greece as the full impact of austerity measures unfolds in the coming years.

References

- Bartley M, Owen C. Relation between socioeconomic status, employment, and health during economic change, 1973–93. *BMJ* 1996;313:445–9.
- Bartley M, Plewis I. Accumulated labour market disadvantage and limiting long-term illness: data from the 1971–91 Office for National Statistics' Longitudinal Study. *Int J Epidemiol* 2002;31:336–41.
- Bartley M. Unemployment and ill health: understanding the relationship. *J Epidemiol Community Health* 1994;48:333–7.
- Gallo WT, Bradley EH, Falba TA, et al. Involuntary job loss as a risk factor for subsequent myocardial infarction and stroke: findings from The Health and Retirement Survey. *Am J Ind Med* 2004;45:408–16.
- Gallo WT, Bradley EH, Dubin JA, et al. The persistence of depressive symptoms in older workers who experience involuntary job loss: results from the health and retirement survey. *J Gerontol B Psychol Sci Soc Sci* 2006;61:S221–8.
- Gallo WT, Brand JE, Teng HM, et al. Differential impact of involuntary job loss on physical disability among older workers. *Res Aging* 2009;31:345–60.
- Martikainen PT. Unemployment and mortality among Finnish men, 1981–5. *BMJ* 1990;301:407–11.
- Stuckler D, Basu S, Suhrcke M, et al. The public health effect of economic crises and alternative policy responses in Europe: an empirical analysis. *Lancet* 2009;374:315–23.
- Svensson M. Do not go breaking your heart: do economic upturns really increase heart attack mortality? *Soc Sci Med* 2007;65:833–41.
- Gerdtham UG, Ruhm CJ. Deaths rise in good economic times: evidence from the OECD. *Econ Hum Biol* 2006;4:298–316.
- Ruhm CJ. Are recessions good for your health? *Q J Econ* 2000;115:617–50.
- Ruhm CJ. Commentary: mortality increases during economic upturns. *Int J Epidemiol* 2005;34:1206–11.
- Ruhm CJ. Good times make you sick. *J Health Econ* 2003;22:637–58.
- Tapia Granados JA. Increasing mortality during the expansions of the US economy, 1900–1996. *Int J Epidemiol* 2005;34:1194–202.
- Tapia Granados JA, Diez Roux AV. Life and death during the Great Depression. *Proc Natl Acad Sci* 2009;106:17290–5.
- Stuckler D, Basu S, Suhrcke M, et al. Effects of the 2008 recession on health: a first look at European data. *Lancet* 2011;378:124–5.
- Eurostat. Unemployment Statistics Available at: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Unemployment_statistics, 2011.
- Kentikelenis A, Karanikolos M, Papanicolas I, et al. Health effects of financial crisis: omens of a Greek tragedy. *Lancet* 2011;378:1457–8.
- Card D, Krueger AB. Minimum wages and employment: a case study of the fast-food industry in New Jersey and Pennsylvania. *Am Econ Rev* 1994;84:772–93.
- Eurostat. *Cross-Sectional European Union Statistics on Income and Living Conditions. 2006, 2007, 2008 and 2009*. Luxembourg: European Commission, 2011.
- Eurostat. National Accounts - GDP. Available at: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/National_accounts_-_GDP, 2011.
- Eurostat. *EU-SILC User Database Description*. European Commission, Luxembourg, 2006.
- Eurostat. *2008 Comparative EU Intermediate Quality Report – Version 2*. European Commission, Luxembourg, 2010.
- Zavras D, Tsiantou V, Pavi E, et al. Impact of economic crisis and other demographic and socio-economic factors on self-rated health in Greece. *Eur J Public Health* 2012; DOI: 10.1093/eurpub/cks143.
- Johansson E, Böckerman P, Prättälä R, Uutela A. Alcohol-related mortality, drinking behavior, and business cycles. *Eur J Health Econ* 2006;7:212–17.
- Barr B, Taylor-Robinson D, Scott-Samuel A, et al. Suicides associated with the 2008–10 economic recession in England: time trend analysis. *BMJ* 2012;345:e5142.
- Reeves A, Stuckler D, McKee M, et al. Increase in state suicide rates in the USA during economic recession. *Lancet* 2012;380:1813–4.
- Katikireddi SV, Niedzwiedz CL, Popham F. Trends in population mental health before and after the 2008 recession: a repeat cross-sectional analysis of the 1991–2010 Health Surveys of England. *BMJ Open* 2012;2. pii: e001790.
- Gili M, Roca M, Basu S, et al. The mental health risks of economic crisis in Spain: evidence from primary care centres, 2006 and 2010. *Eur J Public Health* 2013;23:103–8.
- Jacobson L, LaLonde R, Sullivan D. Earnings losses of displaced workers. *Am Econ Rev* 1993;83:685–709.
- Bartley M. Unemployment and ill health: understanding the relationship. *J Epidemiol Community Health* 1994;48:333–7.
- Gallo WT, Bradley EH, Siegel M, Kasl SV. The impact of involuntary job loss on subsequent alcohol consumption by older workers: findings from the health and retirement survey. *J Gerontol B Psychol Sci Soc Sci* 2001;56:S3–9.
- Bartley M. Job insecurity and its effect on health. *J Epidemiol Community Health* 2005;59:718–19.
- Mohren DC, Swaen GM, van Amelsvoort LG, et al. Job insecurity as a risk factor for common infections and health complaints. *J Occup Environ Med* 2003;45:123–9.
- Hellenic Statistics Authority. Available at: www.statistics.gr, 2011.